ARCHEOLOGICAL EXCAVATIONS AT PRESIDIO SAN AGUSTÍN DE AHUMADA

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with

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in appearance with only a slight trace of patina. Many sherds have striations on the surface showing where the glass was twisted and formed. There are no mold marks. Fifteen sherds are from bottles with deeply concave bases which show pontil scars. There are no lip sherds. The thickness of these bottle sherds varies from 2 to 7 mm. Seven sherds are thin and flat--representing either square bottles or sheets of glass. These sherds vary in thickness from 1.5 to 3 mm.

Modern glass

Numerous sherds of modern, clear-glass jars and bottles, most with threaded necks, were found at the site. These resulted from the Anglo-American occupation and from recent picnics.

Glass beads (4351 specimens)

Colorful glass beads of seventeen different types (Fig. 9) have been recovered from the site of the presidio (see discussion of bead provenience below). The Republic of Venice monopolized the glass bead industry during the eighteenth and most of the nineteenth centuries (Scientific American Supplement, May 1900, 20400) and these beads probably originated there. All of these beads are the hollow-cane type made from a lump of molten glass, containing a central bubble, which is stretched into a long, thin, hollow cane. The cane is broken into bead-length segments which are heat treated to round the edges and make finished beads (Lardner, 1832, Sauzay, 1871). These beads are

of simple, compound, and complex construction (Duffield and Jelks, 1961: 41). The simple beads are composed of a single layer of glass; compound beads are composed of two or three concentric layers of glass; the complex beads are composed of one or more layers of glass plus tiny rods of different colored glass which form longitudinal stripes on the sides of the beads. Compound and complex beads were made by adding additional coatings of different kinds of glass, or colored glass rods, to the outside of the original lump of glass (core). When the decorated mass of glass was stretched out, the hollow cane and the completed beads retained the original construction components in their same relative positions. The edges of all the beads in this sample are well rounded. In general shape the beads range from doughnut shape to very short cylinders with rounded edges. In only one bead was the length greater than the diameter. The bead colors were probably obtained from the following mineral pigments: several shades of blue--cobalt, red--gold, yellow--antimony, green--copper. The different shades of blue found in Styles 1 through 7 below seem to result from the size of the beads and the bubble content of the glass.

Style 1 (5 specimens). Dark blue beads of simple construction which average 7 mm. in diameter and from 5 to 7 mm. in length (Fig. 9, A). At a magnification of 30X the glass is transparent and contains very few tiny bubbles. There are a few widely spaced chains of

very tiny bubbles. The surface of these beads is smooth and frosted in appearance with a very light patina. Bubbles do not open onto the surface.

Style 2 (186 specimens). Medium blue beads of simple construction and having the same size range as Style 1 (Fig. 9, B). At a magnification of 30X the glass is transparent and contains an abundance of bubbles--an occasional one up to about 1 mm. in diameter. Many bubbles open onto the surface which is very pitted and rough in appearance. There is a very light trace of patina.

Style 3 (586 specimens). Dark blue beads of simple construction ranging in diameter from 2.5 to 3.0 mm. and in length from 1.5 to 3.0 mm. (Fig. 9, C). The hole diameter averages about 0.8 mm. At a magnification of 30X the glass is transparent and contains numerous bubbles including occasional large ones. Many bubbles open onto the surface which is pitted and rough in appearance. There is only a slight trace of patina.

Style 4 (265 specimens). Medium blue beads of simple construction ranging in diameter from 3 to 4 mm. and in length from 1.5 to 3.0 mm. (Fig. 9, D). The hole diameter averages about 1 mm. At a magnification of 30X the glass is transparent but cloudy in appearance and contains a myriad of very tiny bubbles (producing the cloudy appearance) but no large ones. The bubbles open onto the surface, but they are so tiny that they produce only a frosted appearance on a relatively smooth surface. There is no obvious patina.

Style 5 (668 specimens). Light blue beads of simple construction ranging in diameter from 2.5 to 4.0 mm. and in length from 1.5 to 3.5 mm. (Fig. 9, E). The hole diameter averages about 1 mm. At a magnification of 30X the glass is transparent but filled with numerous bubbles including an occasional large one up to 1 mm. in diameter. Many of the bubbles open onto the surface which is pitted and rough. There is only a very slight evidence of patina.

Style 6 (531 specimens). Dark blue beads of simple construction ranging in size from 2.5 to 3.5 mm. in diameter and from 2 to 3 mm. in length (Fig. 9, F). The holes average about 0.8 mm. in diameter. At a magnification of 30X the glass is transparent and seems to contain no bubbles. The surface of these beads is smooth and slightly frosted in appearance with no visible patina.

Style 7 (3 specimens). Dark blue glass beads (Fig. 9, G) similar to Style 6 but with four evenly-spaced longitudinal white stripes (complex construction). The four white stripes occupy about one-half of the exterior surface area of each bead--in other words, the four intervening blue bands are about the same width as the white stripes. Each white stripe is composed of three or four tiny parallel rods of white glass which are fused smoothly into the surface of the blue core. At a magnification of 30X the blue glass core is transparent and contains a few scattered bubbles plus some very fine cloud-like chains of bubbles. The white

glass is opaque and filled with bubbles, many of which open onto the surface. The surface of the white glass is rough and pitted; the blue glass has a smooth, frosted surface. There is no sign of patina.

Style 8 (23 specimens). Dark, milky-blue beads of simple construction, ranging in diameter from 2.5 to 4 mm. and in length from 1.5 to 2.5 mm. (Fig. 9, H). Hole diameter ranges from about 0.8 to 1.0 mm. At a magnification of 30X the glass is translucent and has a distinct milky-blue appearance. The glass contains no obvious bubbles, but it does contain snowflake-like impurities which may be clouds of very tiny bubbles. The surface of these beads is smooth and frosted with no traces of patina.

Style 9 (37 specimens). Light milky-blue beads of simple construction ranging from 2.0 to 3.5 mm. in diameter and from 1.5 to 2.5 mm. in length (Fig. 9, I). The holes average about 0.8 mm. in diameter. These beads are very similar to Style 8 except that they are somewhat lighter in color and smaller in size. The glass characteristics are the same.

Style 10 (91 specimens). Dark burgundy red beads of simple construction (Fig. 9, J). Superficially, these beads appear black, but examined against a bright light the color seems to be a deep burgundy red. The diameter ranges from 3.0 to 3.5 mm. and the length from 1.5 to 2.5 mm. The holes range from about 0.8 to 1.0 mm. At a magnification of 30X the glass is opaque and contains very few bubbles (breaks with a very smooth, slick fracture). The surface is smooth and frosted with only slight traces of patina on most specimens--a few beads are heavily patinated.

Style 11 (112 specimens). Yellow beads of simple construction ranging in diameter from 2.5 to 3.0 mm. and in length from 2.0 to 3.0 mm. (Fig. 9, K). The holes average about 1.0 mm. in diameter. At a magnification of 30X the glass is transparent and contains a few widely scattered bubbles. The glass is filled with very fine, parallel, hair-like striations running longitudinally through the beads. These striations do not appear like chains of tiny bubbles. These beads are all coated with a very heavy layer of patina which is light brown in color. When the patina is mechanically removed the surface of the glass is rough and pitted (but not from bubbles).

Style 12 (29 specimens). Pale yellow beads of simple construction (Fig. 9, L). The size range is similar to Style 11 above. At a magnification of 30X the glass appears like that described for Style 11 including the fine striations. The surface of these beads contains few traces of patina, but it is very heavily eroded and pitted (not pitted by bubbles). The eroded pits have an etched look which is probably caused by the striations in the glass. These beads are probably the same as Style 11, except that the heavy coating of patina is not present.

Style 13 (376 specimens). Dark red beads of compound construction (Fig. 9, M). The core is composed of a thick layer of pale green glass (probably bottle glass); on the core is a very thin layer of bright red glass; above the red is a thin layer that appears clear but is probably pale green glass like the core. These beads range in diameter from 2.5 to 3.5 mm.

and in length from 1.5 to 3.0 mm. The hole diameters vary from about 0.7 to 1.1 mm. At a magnification of 30X the core glass is transparent and contains very few bubbles, the red glass (probably pigmented with gold) is opaque and seems to contain no bubbles, and the outer coating of glass is transparent and contains very few bubbles. An occasional large bubble (up to 0.5 mm.) is found in one of these beads. The surface is smooth and frosted in appearance and shows no trace of patina.

The use of a thin layer of red glass sandwiched between a pale green core and coating probably enabled the manufacturers to produce an attractive red bead with a minimum expenditure of expensive red glass. Beads of this type are often referred to as "Cornaline de 'Aleppo" beads (Duffield and Jelks, 1961: 49; Watt and Meroney, 1937: 55; Gregory and Webb, 1965: 19 and 29). A long cylindrical bead of this type (about 1.5 cm. in length) was allegedly found at the site by a friend of the landowner.

Style 14 (7 specimens). Dark red beads of compound construction (Fig. 9, N). The core is a thick layer of bright red glass; this is coated with a very thin layer of clear or pale green glass. The size ranges from 2.5 to 3.0 mm. in diameter and averages about 2.0 mm. in length. The hole diameter averages about 0.8 mm. At a magnification of 30X the core glass is opaque, contains very few bubbles, and has hair-like striations running longitudinally through the bead. Viewed at the end of the bead, the core glass has a marbled appearance. Apparently red glass

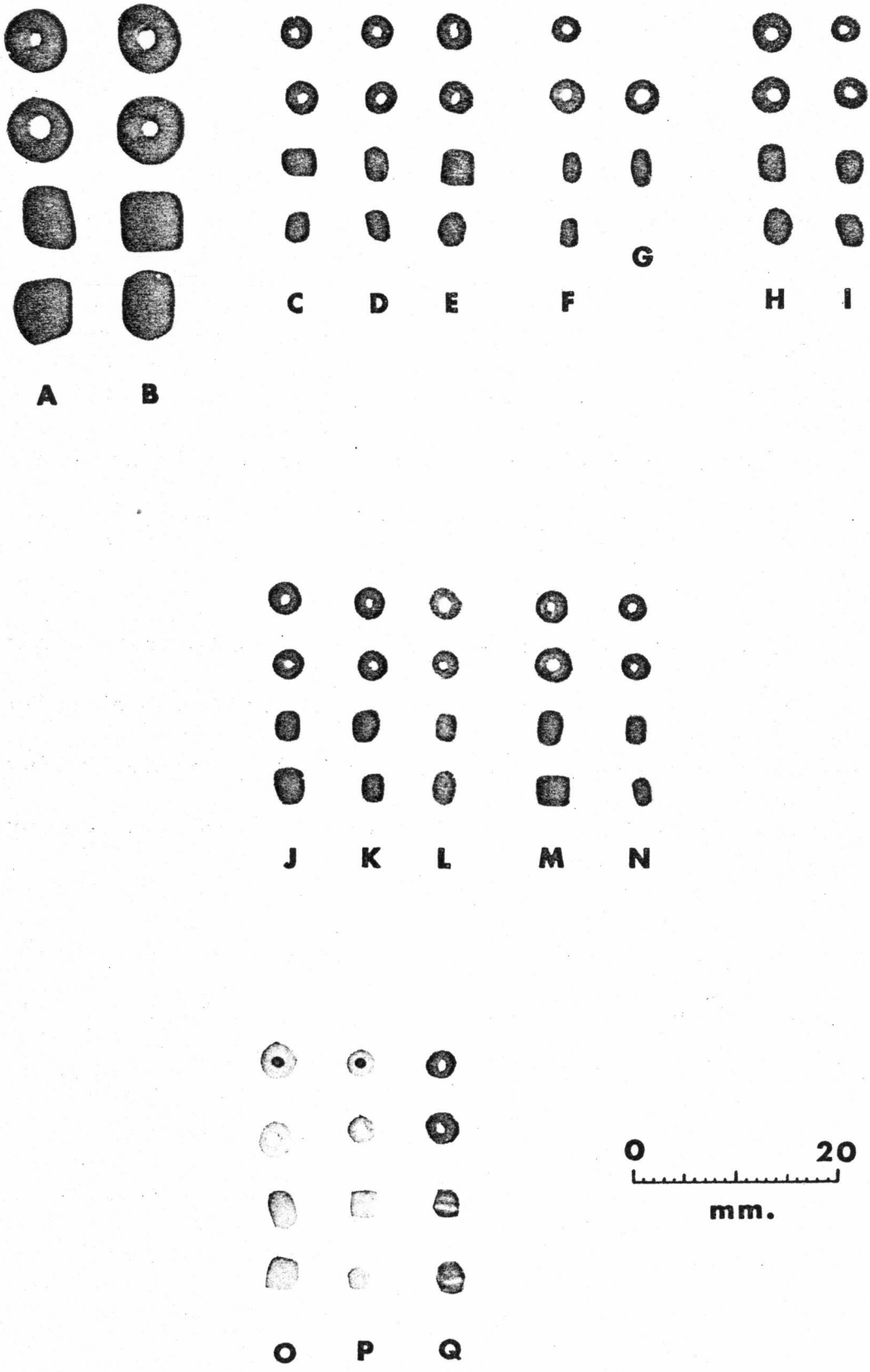
and clear or pale green glass was mixed in about equal quantities to form the core and they were stirred together (marbled) but never completely blended. When the glass mass was stretched out into the hollow cane, the marbled glass formed hair-like striations of alternating red and clear glass running through the cane. The outer layer of glass is transparent and contains very few bubbles. The surface is smooth and slightly frosted with no traces of patina.

This manufacturing technique produced a bead similar in color to Style 13, but without the obvious green core. The red glass was probably mixed with the clear or pale green glass in order to conserve the expensive red pigment.

Style 15 (169 specimens). White beads of compound construction (Fig. 9, O). The core is a thick layer of white glass; this core is coated with a very thin layer of clear or pale green glass. These beads range in diameter from 3.0 to 4.5 mm. and in length from 2.0 to 3.0 mm. The holes range from about 0.8 to 1.1 mm. in diameter. At a magnification of 30X the core glass is milk white, only slightly translucent, and contains very few bubbles. The thin outer layer is transparent and seems to contain no bubbles. The surface is smooth and lightly frosted with faint traces of patina.

Style 16 (1,247 specimens). White beads of compound construction (Fig. 9, P). The core is a thick layer of white glass and it is coated with

Figure 9. Glass Beads. A, Style 1; B, Style 2; C, Style 3; D, Style 4; E, Style 5; F, Style 6; G, Style 7; H, Style 8; I, Style 9; J, Style 10; K, Style 11; L, Style 12; M, Style 13; N, Style 14; O, Style 15; P, Style 16; Q, Style 17.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a very thin layer of clear or pale green glass. These beads are identical to Style 15 described above, except they are slightly smaller in size, ranging from 2.0 to 3.0 mm. in diameter and from 1.5 to 2.5 mm. in length with holes from 0.8 to 1.0 mm. in diameter.

Style 17 (16 specimens). Clear glass beads of simple construction, ranging in diameter from 3.0 to 3.5 mm. and in length from 2.0 to 3.5 mm. (Fig. 9, Q), with holes averaging about 0.8 mm. in diameter. At a magnification of 30X the glass is transparent and contains numerous chains of bubbles running longitudinally through the beads. The bubbles do not open onto the surface which is smooth and slightly frosted with no visible patina.

Provenience of glass beads

None of the glass beads were found in controlled test excavations at the site. One of the landowners dug a burial from the wall of the borrow pit in the center of the ridge (Fig. 2; Appendix I). The following beads were found associated with the burial: Styles 3, 4 and 5--85 specimens; Style 9--30 specimens; Style 10--16 specimens; Styles 15 and 16--9 specimens. A few beads of each type were found imbedded in sandy soil adhering to the bones--unquestionably associated. About two dozen Style 2 beads were found on the access road leading to the site and were probably deposited there in fill from the site. The remainder of the bead sample was screened by the landowner from loose fill on the sides and bottom of the borrow pit in the center of the site. Most of these beads probably came from other burials which were destroyed by the borrow pit.

Glass beads are found in great quantities on Indian village sites and in Indian burials which date in the historic period. The Spanish apparently used these beads only as gifts or trade items for the Indians and consequently beads are rare at purely Spanish sites (missions and presidios) except in Indian burials or on the floors of Indian huts.

Contemporaneity of the glass beads and Presidio Ahumada cannot be demonstrated--Indians could have been buried here before, during, or after the presidio occupation--but in view of the fact that the only burial recovered was probably not a Texas Indian, it is likely that they were deposited at the site during the period of its occupation. These beads could have been of Spanish or French origin at this particular outpost because of its intermediate location (see discussion of ceramics).

Comparisons

Several archeological reports have described samples of glass beads recovered from archeological sites in sufficient detail so that the following brief comparisons can be made with reasonable confidence.

Watt (1937) describes a sample of about 30,000 beads from historic Indian campsites in Central Texas. Presidio Ahumada bead styles compare to his bead types as follows: Style 3--No. 32; Styles 2 and 5--No. 62; Style 7--No. 141; Style 10--No. 126; Style 13--No. 82; Styles 15 and 16--No. 2; Style 17--No. 22.

Duffield and Jelks (1961) describe a sample of about 2,000 beads from a historic Indian village, which they believe was possibly visited by the Spanish around 1760, in Northeast Texas. Bead styles from Presidio Ahumada compare with their types as follows: Style 1--large, dark blue, doughnut-shaped; Style 2--medium, robin's egg blue, subcylindrical; Style 3--small, dark blue, subcylindrical; Style 5--small, robin's egg blue, subcylindrical; Styles 8 and 9--small and medium, light blue, doughnut-shaped; Style 10--small and medium, purple-black, doughnut-shaped; Style 13--small, clear/red/green, doughnut-shaped; Styles 15 and 16--small, clear/white, subcylindrical; Style 17--small, translucent, colorless, doughnut-shaped (except they state that the ends are heavily pitted with air holes).

Harris et al. (1965) describe a sample of about 2,000 glass beads from a historic Indian village in Northeast Texas which they feel dates to the early eighteenth century. Presidio Ahumada glass bead styles compare to their bead types as follows: Style 2--type 11; Style 3--type 47; Style 5--type 46; Style 6--type 48; Style 10--possibly type 50; Style 13--type 51; Styles 15 and 16--type 45; Style 17--type 49. Harris and Harris (1966) describe additional types of trade beads from historic Wichita sites. The following bead styles from Presidio Ahumada are comparable to their types: Style 1--type 164; Style 7--type 115; Style 9--type 79; Styles 11 and 12--type 82; Style 14--type 87. R. K. Harris

generously furnished the following comments concerning his bead types mentioned above: "Type 47 occurs commonly in sites dated from 1700 to 1740 and to a lesser extent in sites dated from 1740 to 1767. It disappears altogether from the trade around 1767. Types 79, 82 and 164 appear in the trade during the period 1740 to 1767 and continue into the early nineteenth century. Type 87 occurs in only one site on my charts--the Gilbert Site, a mid-eighteenth century site in Raines County, Texas. Type 115 occurs in small numbers in sites occupied between 1767 and 1820. Types 11, 45, 46, 48, 49, 50 and 51 are not very definitive as they occur in sites dating from 1700 through 1836.

Gregory and Webb (1965) describe glass trade beads from six sites in northwestern Louisiana including Presidio Los Adaes. Most of their sites date between the early eighteenth and early nineteenth centuries and the beads were presumably supplied by French traders during much of that time. The Presidio Ahumada beads compare with their types as follows: (1) Southern Compress Site. Style 2--no. 15; Style 13--no. 13; Style 15--no. 5. (2) Fish Hatchery Site. Style 15--no. 6. (3) Lawton Site. Style 2--nos. 16 or 19; Style 5--no. 20; Style 13--no. 10; Style 15--no. 6. (4) Wilkinson Site. Style 4--no. 7. (5) Presidio Los Adaes. Style 1--no. 5; Styles 2 and 5--no. 4; Style 3--no. 15; Style 4--no. 13; Style 6--no. 16; Style 7--no. 8; Style 10--nos. 9 and 12; Style 13--no. 6; Style 16--no. 27; Style 17--no. 23. (6) Colfax Ferry Site. Styles 3 and 4--

no. 31; Style 9--no. 30; Style 10--no. 25; Style 13--no. 28; Styles 15 and 16--no. 26; Style 17--no. 29. All of the collections described by Gregory and Webb contain numerous types of large and fancy trade beads--none of which were found at Presidio Ahumada. The beads from Ahumada compare most closely with those from the site of Los Adaes with which Ahumada was affiliated throughout its occupation.

Tunnell (1965) describes a sample of about 130 glass beads from Indian burials at Mission San Lorenzo (Southwestern Texas) occupied in the 1760's. The glass bead styles from Presidio Ahumada compare with those beads as follows: Style 2--medium, simple, blue-green; Style 3--small, simple, blue; Style 10--small, simple, burgundy red; Style 13--small, compound, red; Styles 15 and 16--small, compound, white; Style 17--small, simple, clear.

Two of the bead samples used for comparison (Duffield and Jelks, Tunnell) date to about the same time period as Presidio Ahumada (late eighteenth century) and are probably of Spanish origin. The sample reported by Harris et al. is probably early eighteenth century and of French origin. The Presidio Ahumada beads are probably late eighteenth century and of Spanish or French origin. Based on these comparisons it appears that at least six basic types of beads were in common use by the Spanish and French in this area, during much of the eighteenth century; Style 2--medium size blue beads of simple construction; Styles 3 and 5--

small blue beads of simple construction; Style 10--small burgundy red/black beads of simple construction; Style 13--small bright red beads of compound construction; Styles 15 and 16--small white beads of compound construction; Style 17--small clear beads of simple construction. Glass beads found at Presidio Ahumada in small numbers and which occur rarely in other samples include Styles 7, 8 and 9, 11 and 12, when heavily patinated, could be easily included with either colors of small beads; Style 14 beads closely resemble Style 13 and could be easily lumped with them. In sum, a glass bead sample should be thoroughly cleaned, carefully sorted, and many specimens broken and studied under a microscope if the rarer styles are to be segregated. The rarer styles of beads may prove to be the best indicators of time periods and places of origin.

Copper Artifacts

All of these articles are handmade from copper alloy consisting of copper mixed with smaller quantities of zinc (brass) or tin (bronze). The alloy was probably prepared in Central Mexico and shipped out to the frontier in the form of sheets, bars, and wire to be fashioned into a variety of functional and decorative items. Some of these artifacts were probably made at the site; others may have been brought from Los Adaes or San Antonio. All of these specimens are coated with a very thin and