ENGINEER DEPARTMENT, U. S. ARMY.

REPORT

UPON

UNITED STATES GEOGRAPHICAL SURVEYS

WEST OF THE ONE HUNDREDTH MERIDIAN,

IN CHARGE OF

FIRST LIEUT. GEO. M. WHEELER,
CORPS OF ENGINEERS, U. S. ARMY,

UNDER THE DIRECTION OF

BRIG. GEN. A. A. HUMPHREYS,
CHIEF OF ENGINEERS, U. S. ARMY.

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BEADS.

By S. S. Haldeman.

Beads have been extensively used in ancient and modern times by savage and civilized nations, which gives them a value in ethnology. Upon the western or Vesperian continent certain forms are spread from ocean to ocean, particularly such as are made of molluscous shells, and constitute wampum. Among the materials used are seeds, nuts, and other vegetable productions; fossils with natural perforations, such as encrinites; worked stone, burnt clay, metal, bone, claws of beasts and birds (the latter sometimes made into rings by inserting the points successively into the open bases until the ring is closed); teeth of men, deer, bears, wildcats, peccaries, monkeys, alligators, sharks, &c.;* wing-cases of beetles, and the shells of mollusca, univalves of various sizes being strung entire,† the larger, together with bivalves, being shaped into disks, cylinders, and irregular pieces used as gorgets. Besides these, during the last three centuries, Venetian glass beads have been widely spread, their varieties of color, form, and size making them attractive. Even when these occur in mounds and graves, they are not to be regarded as older on this continent than the Columbic discovery, notwithstanding several of the patterns are ancient Egyptian, Assyrian, and Phenician, whence the manufacture was somehow inherited by modern Venice, perhaps in connection with Rhodes, where Græco-phenician

*The Caribs of Guiana "decorate themselves with beads made of fishes teeth." . . . Henry Bolingbroke, A Voyage to Demerary, 1807, p. 145. "Women [of the Indians] wear a little apron of glass beads," p. 153.

The Fingoes of S. Africa use wolf teeth as ornaments. Mrs. Harriet Ward, Five Years in Kaffirland, 1848, vol. i, p. 251.

An Abyssinian necklace in my collection is composed of European beads, cowries (Cyprea shells), a triangular plate of brass, two small copper coins, small spheric brass buttons, carnelian, date seeds, numerous cloves pierced through the side, a fragment of wood, a bit of cane, and an Arab phylactery.

†See Lartet and Christy, Reliquiæ Aquitanicæ, B. plates v and xi. C. C. Jones, Southern Indians, chapter xxii, pl. xxx.

examples occur as early as B. C. 500–850, a period suggested to me by Mr. A. W. Franks, of the British Museum.

The early date of A. D. 1500 is connected with the appearance of beads on the western continent, for in that year Cabral discovered Brazil and purchased supplies with "beads, bells, and such trinkets."

The beads collected at Dos Pueblos and La Patera include some interesting examples.

(1.) The first of these is a stout bead of the rare material copper, probably native,* bent from a beaten strip originally 14 millimetres in width, this forming the length of the bead. The diameter is somewhat less than the length, the form cylindric, with the edge of the terminal angles rounded off. Plate XIII, Fig. 8, actual size. Copper beads formed of curved flakes occur in mounds of the Mississippi region,† and in graves in Eastern Pennsylvania.

(2.) Several dark gray, cylindric, or barrel-shaped specimens of talc slate from $\frac{1}{4}$ to $\frac{7}{8}$ inch long, and from $\frac{1}{2}$ to $\frac{3}{4}$ in diameter; perforation from $\frac{1}{8}$ to $\frac{1}{4}$ inch. Plate XIII, Fig. 3. Dos Pueblos.

(3.) A single specimen of polished stone resembling a pale-green feldspar, $\frac{1}{4}$ of an inch long, shaped like the preceding figure. La Patera.

(4.) Resembling black serpentine with yellowish veins; cylindric, surface polished; length about $\frac{1}{2}$ inch, diameter nearly $\frac{1}{4}$ inch, Plate XIII, Fig. 7. I have a larger ancient Peruvian specimen ($\frac{5}{8}$ inch) of polished, light-blue stone, but with the perforation contracted at the middle. See description of No. 8.

(5.) Blue fluorite, some with pale bands; subcylindric, varying in length from $\frac{3}{16}$ to $\frac{3}{4}$ inch. In some of the shorter examples the hole is countersunk at both ends, Plate XIII, Figs. 1, 2, 4, 5, 6. La Patera and Dos Pueblos. Mr. Lorenzo G. Yates‡ mentions beautiful cylindric beads of what he thinks a magnesian silicate, banded or mottled in white, brown, and

* John R. Jewitt (Adventures, ed. 1824, p. 170) mentions copper arrow-points at Nootka, 1803.

† R. J. Farquharson, Exploration of Mounds near Davenport, Iowa. Proceed. Am. Assoc., vol. 24, 1875, p. 297, pl. 6. Jones (Southern Indians, 1873, pp. 47 and 529) mentions gold beads and copper pendants as occurring in Georgia. In a mound in Ohio a lot of about five hundred copper beads were found and are now in the Peabody Museum (6992), where are also several other lots from mounds in the South and West. See Tenth Report Peabody Museum, pp. 60, 65, 1877. Small beads of copper were used by the ancient Egyptians.

‡ American Naturalist, Jan. 1877, pp. 30–31.

yellowish. With these we may compare allied stone specimens collected by Mr. E. A. Barber in the ancient pueblos of the Pacific slope *

Shell beads for ornament or money have been and are still in use, either unaltered, or ground into shape, varying greatly in length, from short disks to long cylinders, made on the coast from species having the requisite thickness of shell, or from fresh-water mussels (*Unio*) in the interior. Mr. Yates mentions that the disks represented by his figure B (about ½ inch in size) are valued by the Indians at eighty for a dollar.

The most popular Atlantic species of wampum-shell was the clam (*Venus mercenaria*), and on the Pacific the *Tivola crassatelloides*, of which the former has parts where the white is varied with blue, and the latter with blue externally and brown within, giving a pleasing variety to the resulting work. Mr. Yates figures a specimen (C) made of *Haliotis* and shaped like a keystone, resembling a mound example in silver (but without a curved side) figured by Brett.†

(6.) Includes disks about $\frac{3}{16}$ inch thick and 1–1½ in diameter of white shell. In some cases the perforation is out of centre, but not marginal. Plate XII, Fig. 40. Dos Pueblos and La Patera. Mr. Yates figures a Californian bead like the preceding, about ½ inch in diameter, with the hole countersunk on each side, a form which occurs in mounds in Missouri and West Virginia, and Mr. Thomas Masterson (Columbia, Pa.) has it from graves in Tioga County, Pennsylvania.‡ There are also many hundred of these in the Peabody Museum from the burial mounds and caves of Tennessee.

(7.) Disks, short cylinders, and nearly spheric forms of shell, the surface disintegrated by age (Plate XIII, Figs. 34, 35). In one spheric specimen, about ½ an inch (12 millimetres) in size, the hole is bushed at one end with a small (3 millimetres) cylindric bead as if to diminish the size as made by the boring-tool. La Patera.

(8.) Shell cylinders (Plate XIII, Fig. 38) from about an inch to nearly 2 inches long and $\frac{3}{16}$ to $\frac{5}{16}$ in diameter; surface decayed; largest specimen

* American Naturalist, May, 1877, p. 273, fig. 6*a*.

† Indian Tribes of Guiana, London, 1868, p. 440.

‡ See Mr. Stearns on "Aboriginal Shell Money," American Naturalist, June, 1877; and Dr. Rau on the Archæological Collection of the National Museum, Washington, 1876, p. 69.

bushed at one end, but narrowed about the middle by the shape of the boring-tool, the workman being satisfied with any perforation that would permit a string (commonly a sinew) to pass. An irregularity of perforation in which the two parts are not in line is common in perforated stone beads, and often to such an extent as to forbid the passage of a needle. The smallest of the shell cylinders (about $\frac{3}{16}$ inch diameter and $1\frac{1}{4}$ long) has a perforation but little more than a millimetre (or less than $\frac{1}{16}$ inch) in diameter, and the difficulty of making it must have been very great. Cut from *Tivola*. La Patera and Dos Pueblos.

(9.) Several curious subcylindric beads, cut from *Tivola*, and exhibiting the blue and white coloring. The longest is $1\frac{3}{8}$ inches long, about $\frac{1}{4}$ diameter in the middle, and tapering to each end except on one side, which is rectilinear. The perforation (of about 1 millimetre) is so small that it would be difficult to pass a thread, and probably on this account a rounded notch occupies the middle, where more than half the thickness has been cut away as if to free the perforation and permit threads to be passed from each end and knotted separately or together at the middle. In a second specimen the notch nearly reaches the perforation; in the third the notch is quite superficial, and does not reach the centre.* In some cases the notch may be due to the fact that the borings from each end did not meet. Plate XIII, Figs. 42, 43, 44, 45, 46 La Patera.

(10.) Slender blue subcylindric shell beads made of *Tivola*. Plate XIII, Figs. 36, 37. La Patera and Dos Pueblos.

(11.) Small thin wampum disk beads (Plate XII, Figs 3, 4, 5), from about $\frac{1}{8}$ to $\frac{1}{4}$ inch in size; cut from univalve shells, and therefore slightly concave and convex on the opposite sides. One specimen is not completely rounded, and the unfinished perforation has been commenced on one side. A few are flat as if worked from the solid shell. Plate XII, Fig. 6. La Patera and Dos Pueblos.

* Other examples of this form received since the beads were examined by Dr. Haldeman show that the notches were subsequently filled with asphaltum even with the surface of the shell. One specimen with the asphaltum filling removed from the notch, and shown under the figure, is represented by Fig. 42 of the plate; and a second specimen with a bunch of asphaltum in place, the outline of which can be distinctly seen by using a lens, is shown in Fig. 43. Figs. 44, 45, and 46 exhibit the three specimens referred to in particular by Dr. Haldeman, in two of which the notch has been but partly cut to the intended depth.—F. W. P.

(12.) Akin to the preceding, ¼ to ⅜ inch, convexity and concavity greater, giving the appearance of little saucers.* Plate XII, Fig. 7.

(13.) Whitish cup-shaped fragments about ⅝ inch in size. Plate XII, Figs. 28, 29. They are roughly shaped from the univalve shell of *Olivella biplicata*, specimens of which (Plate XIII, Fig. 66) occurred with the beads; hole central, varying in size. Similar beads have been figured by Yates.† The shell itself, with the apex ground off, is strung for ornament by the natives of Oregon.

(14.) Several small univalves (probably *Oliva*), ⅜ inch long, with the apex rubbed off to allow them to be strung lengthwise. Plate XIII, Figs. 39, 40, 41. Dos Pueblos. Small allied specimens treated thus are found upon the string in old Peruvian tombs.

A small *Marginella* (*M. apicina*) of the Atlantic coast occurs in graves in New York and in mounds in Western Virginia, Tennessee, and Missouri, the side of the apex being rubbed off to make an opening. The occurrence of an Atlantic species in Missouri shows an extensive commerce.‡ The popularity of a small white oval Venetian bead among the aborigines may depend upon its general resemblance to such small marine univalves.

(15.) *Dentalium indianorum* and *D. hexagonum* (as labelled by the late Mr. Anthony). Santa Barbara, La Patera, Dos Pueblos. Mr. Yates (already cited) figures a species, and says they are imported from Europe for trade. In the Adventures of John R. Jewitt, we are told that at Nootka the ife-waw "forms a kind of circulating medium among these natives, five fathoms being considered as the price of a slave—their most valuable species of property." He describes the laborious native method of fishing for them. This was in 1803.

(16.) Apparently very small perforated wampum disks (1½ to 2 millimetres diameter) aggregated in little cylinders, but too regular for hand-

* The small shell beads, referred to by Dr. Haldeman as belonging to his groups 11 and 12, have proved to be a very common form in California, and the later explorations have resulted in the collection of many thousands from the graves, particularly on the Santa Barbara Islands. From the graves at the isthmus on Santa Catalina alone Mr. Schumacher has sent to the Peabody Museum (13282) nearly *a bushel* of these small beads.—F. W. P.

† American Naturalist, Jan. 1877, p. 30, fig. G; the shell, fig. F.

‡ See Dr. Rau on Ancient Aboriginal Trade of North America, in the Smithsonian Report, 1872, pp. 372–83.

work. They are probably branches of a recent crinoid or other radiate. Plate XII, Figs. 1, 2. Dos Pueblos.

(17.) Cones of brown asphaltum roughly moulded as if by hand, about ½ inch long, the base about ¼ inch in diameter, the truncate apex ⅛ inch or more, with a small hole down the axis, but not reaching the base. Plate XIII, Figs. 9, 10, 11, 12, 13. They seem to belong to the class of pendants used on fringes, and being probably moulded upon the string which was to suspend them; the decay of this would leave an opening. Abundant in the excavations at La Patera and Dos Pueblos,* but an uncommon form of ornament. Some of these clove-shaped asphalt ornaments were found by Dr. Yarrow's party, in the holes of which were small pieces of what were supposed to be dried grass.

Glass beads from ⅛ to 1 inch in size, of various shapes and colors (transparent, translucent, opake), were found abundantly in the excavations at Dos Pueblos and La Patera. These, with perhaps some exceptions, are Venetian, green and red being the predominant colors.

Among the articles shipped in England for trade on the Northwest coast, Jewitt (already quoted) mentions, as part of a cargo in 1802, "looking-glasses, beads, knives, razors, &c., which were received from Holland"; and when Cabral discovered Brazil in 1500 he mentions using beads in trade with the natives They are found in Indian graves on both sides of the continent and in many interior localities.

(18.) The figure (Plate XIII, Fig. 18) represents an oval bead of white glass or enamel, which occurs in graves at Dos Pueblos and Santa Cruz Island. Another specimen is modern Ute, got in Colorado by E. A. Barber, 1875. Mr. W. H. Holmes, of the Geological Survey of the Territories, found one with the polish nearly removed by time among the *débris* of ruins on the Mancos River, Southwest Colorado, and both Drs. Rothrock and Loew, of the Geographical Surveys West of the 100th Meridian, have found them in ruined pueblos in Colorado—a possible evidence that this deserted locality was occupied since the Columbic discovery, although it must be admitted that the specimens may have been dropped by recent Indians.

* These singular ornaments (?) have also been collected from graves on the island of San Miguel by Mr. Bowers (P. M. 13728).

(19.) Known as the "coralline d'Aleppo"; has a great range over the world It is a spheric or cylindric Venetian bead of many sizes, externally red, with a white, whitish, yellowish, or pink interior; spheric. Length, ⅛ inch diameter, or little more. A single bead, among others, from Dos Pueblos and La Patera. A specimen (¾ inch long, ⅜ diameter) was found by Mr. W. H. Holmes in 1875 near the trail on the Mancos River, Southwest Colorado.

(20.) Akin to the preceding, outside red, inside black. Dos Pueblos and La Patera. Plate XIII, Fig. 22.

(21.) Small yellow; glass fresh looking. Same locality

(22.) Small white; fresh. Same locality.

(23.) Two beads about ⅜ inch long, ½ in diameter, of deep blue glass, one alone retaining its polish, with four pentagonal facets at each end, meeting in a central, transverse zigzag line. Same locality. I have this variety from graves near Columbia, Pa.

(24.) A five-sided dark glass bead, ⅜ inch long and wide, surface somewhat worn. Plate XIII, Fig. 32. Dos Pueblos.

(25.) Fragment of a large deep-blue oval bead somewhat oxidized and the fracture not fresh; medial diameter ¾, length probably 1½ inches. Dos Pueblos.

(26.) Spheric, ¾ inch diameter, of dark-blue glass; polish deteriorated. La Patera. A smaller specimen of the same character is represented on Plate XIII, Fig. 28.

(27.) A trifle smaller than the preceding, surface with more polish, mottled with light brown; these parts oxidized upon one side. Plate XIII, Fig. 33. La Patera.

(28.) A flat bead of bluish translucent opalescent glass, ½ inch diameter. Plate XIII, Fig. 26. La Patera.

(29.) Various specimens from La Patera and Dos Pueblos, exhibiting oxidation of the glass from lying in the soil, perhaps for several centuries. Three of a conical shape are represented on Plate XIII, Figs. 16, 17, 23, and three others of an oval form in Figs. 29, 30, 31.

(30.) A blackish purple cylindric bead about an inch long and ¼ inch diameter. La Patera.

(31.) Small ruby-colored beads of irregular shapes, spheric, oval, and facetted. Plate XIII, Fig. 24.

(32.) Spheric, ruby-colored, ¼ to ⅜ inch in size, marked with white foliate lines. This and the next example are of well-known Venetian patterns. Plate XIII, Fig. 25. Dos Pueblos and La Patera.

(33.) Slender, about ½ inch long, dark blue, hooped with raised lines of white or yellow. Plate XIII, Fig. 27. La Patera.

(34.) Two star-pattern, polychrome, cylindric beads. Plate XIII, Figs. 14, 15. A pattern called "rosetta" at Venice, where spheric and cylindric forms of it are still made. The larger is nearly 1 inch long and ⅜ diameter. They are composed of glass or enamel of several colors, one surrounding another, so that they are visible only at the ends, until these are rounded or ground in sloping facets, when all the colors appear. The inner colors are arranged to form a star or zigzag line in section, the edge of the rays of which often appear through the translucent exterior color in longitudinal lines of a paler blue when the exterior of the bead has this color, and the outer rays of the star are white. The Venetians seem to have inherited the art of making them, for they are known to Egyptian and Phœnician antiquity; they occur in graves in Europe and America. On this continent they have been found in Canada, New York, Pennsylvania, Florida, and California. The Smithsonian Institution has specimens from New York, Santa Barbara, Cal., and one from a mound in Florida, in connection with which I have given various details and bibliographic references.* In the archaic specimens I have seen in Europe and America the outer layer is blue, the modern Venetian examples being blue, red, green, and yellow, the last striped with black.

The Smithsonian Institution has recently secured a collection of about five hundred varieties of modern Venetian beads. That Institution and also the Peabody Museum at Cambridge have many specimens from aboriginal natives and their graves, and collectors would do well to add to those collections from all sources. Interesting examples occur in the Cesnola and Egyptian collections of the Metropolitan Museum, New York, and my own

* Since published in the Smithsonian Report for 1877, p. 203, fig. 1.

cabinet includes specimens illustrating this branch of the ethnology of various ancient and modern nations.

(35.) Numerous glass beads of various shapes and colors from La Patera and Dos Pueblos. Plate XIII, Fig. 19, cylindric, pink color; Fig. 20, round, green; Fig. 21, cylindric, green.