

TURQUOIS WORK OF HAWIKUH NEW MEXICO

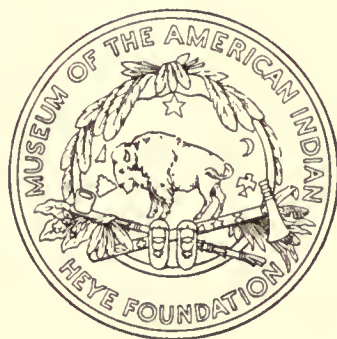


LEAFLETS OF THE
MUSEUM OF THE AMERICAN INDIAN
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TURQUOIS MOSAIC OBJECTS FROM HAWIKUH

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TO
HARMON WASHINGTON HENDRICKS
THROUGH WHOSE KEEN INTEREST AND GENEROUS PATRONAGE
THE EXCAVATION OF THE RUINS OF HAWIKUH, NEW MEXICO,
HAS BEEN MADE POSSIBLE, THIS LEAFLET IS DEDICATED, IN
COMMEMORATION OF HIS SEVENTY-FIFTH ANNIVERSARY, BY THE
DIRECTOR AND STAFF OF THE MUSEUM OF THE AMERICAN
INDIAN, HEYE FOUNDATION

NEW YORK, MARCH 22, 1921

Turquoise Work of Hawikuh, New Mexico

"It [turquoise] has the virtue of soothing the sense of vision and the mind, and of guarding against all external dangers and accidents; it brings happiness and prosperity to the wearer. Suspended in a glass it sounds the hour. When worn by the immodest, it loses all its power and color."—*Mylius*, 1618.¹



TURQUOIS has ever been regarded as one of the most valued possessions of the Pueblo Indians, for ornaments fashioned therefrom have been found in numerous prehistoric dwellings of the Southwest and in the graves of their builders, often in such connection as to indicate the sacred character of the material. Doubtless the source of most of the turquoise in both early and recent times in New Mexico was the Cerrillos mountains, about twenty miles south-southwest of Santa Fe, noted for its extensive pre-Spanish excavations; but other deposits with evidences of ancient working with rude stone tools, as well as the tools themselves, and sherds of corrugated pottery in some cases, have been observed in the Burro and the Little Hachita mountains in Grant county, and in the Jarilla hills in Otero county.² Present Zuñi knowledge points to Los Cerrillos certainly as the chief source of supply from the earliest times, hence we need not consider here the anciently worked deposits of turquoise in Arizona.

Quoting Mrs Stevenson, Pogue (p. 124) refers to the legend of the origin of the sacred Salt lake of the Zuñi, in which the turquoise is personified in the form of Hlíakwa (the native name of turquoise), who journeyed southwestward from the pueblo of Santo Domingo and made his home in a high mountain protected by many angry white and black bears. "Hither the Zuñi make pilgrimages today to collect turquoises, which they are supposed to obtain only after the bears are appeased by sacrifice of plumes and sacred meal, brought for that purpose." Then in a note Pogue adds, "Concerning the whereabouts of this mountain, Mrs Stevenson says she was bound to secrecy."

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It is not known that the Zuñi Indians actually quarried turquoise in ancient times; more likely they obtained it then, as more recently, by trade with Rio Grande Pueblos, notably the Tano,³ and later the Queres of San Felipe and Santo Domingo, until the deposits came under the control of corporations and Indian quarrying practically ceased, since which time distribution has been made through white traders. It is said that the natives of the pueblos mentioned, and also the Tewa, were the chief workers of the turquoise deposits of the Cerrillos, as well as the principal distributors. Indeed, writing of the source of the turquoise used by the ancient Mexicans, Pogue (p. 96) goes so far as to say that "it is almost certain that part of it at least was obtained through trade from the Cerrillos located in New Mexico, which was extensively exploited in pre-Spanish time."

Owing to the labor of obtaining turquoise with the crude means at the disposal of the Indians, together with the difficulty of transporting it for long distances without the aid of animals, this material was not very abundant in the Pueblo region in ancient times, compared with the quantities used today both by the Pueblos and the Navaho, although in this regard we may except Pueblo Bonito, in the Chaco cañon, where Pepper found more than fifty thousand worked pieces, including beads, in a single ceremonial chamber.⁴ In recent years, owing to the demand by white people, large quantities of turquoise have been worked into settings for silver bracelets, rings, and other ornaments, especially by the Navaho, who are the most noted silversmiths and jewelers of the Southwest. Silver was hardly if at all known to the Indians before the coming of the Spaniards, and there is no evidence that our Southwestern tribes gained knowledge of metal-working until comparatively recent years. Dr Matthews,⁵ however, seems to have been of contrary opinion, for he says: "When and how the art of working metals was introduced among them [the Navaho] I have not been able to determine; but there are many reasons for supposing that they have long possessed it; many believe that they are not indebted to the Europeans for it. Doubtless the tools obtained from American and Mexican traders have influenced their art. Old white residents of the Navajo country tell me that the

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art has improved greatly within their recollection; that the ornaments made fifteen years ago do not compare favorably with those made at the present time." Silverware was not studded with turquois to any considerable extent when Matthews wrote, nor for several years later.

The Zuñi say that perfect blue turquois is the male, the off-colored the female, and that the upper world or zenith is symbolized by the sun, eagle, and turquois. The west is the blue world, "not only because of the blue or gray twilight at evening, but also because westward from Zuñiland lies the blue Pacific." The Zuñi reverence as fetishes objects of various materials fashioned to represent different animals; for example, a fetish of the blue coyote of the West is composed of a compact white limestone with traces of blue paint and large turquois eyes, and many other fetishes are provided with eyes and other organs of turquois. This stone is frequently alluded to in the folk-tales of the Zuñi, including that of "The Youth and the Eagle," in which the eagle bore the youth upward into the sky world, where "it alighted with its beloved burden on the summit of the Mountain of Turquoises, so blue that the lights shining on it paint the sky blue." Ornaments of turquois are often alluded to in these tales.^o

However, it is the ancient use of turquois by the Zuñi who inhabited the now-ruined pueblo of Hawikuh that chiefly concerns us here. Not only did the excavations at that site reveal the working and use of this gem for ornamental and sacred purposes, but a number of references to its use at Hawikuh are to be found in the Spanish writings of the sixteenth century.

When Fray Marcos de Niza⁷ made his famous journey to Cibola in the early summer of 1539, he was told by an Indian who had been sent back to the friar by the negro Estevan and who had visited Cibola, "that in the gates of the principall houses there are many Turquestones cunningly wrought, whereof hee sayth they have there great plentie." About the same time other messengers were sent back by Estevan, who verified the previous reports. "I enquired of them," wrote Fray Marcos, who was then a month's journey from Cibola, "wherefore they travelled so farre from their houses? They said

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that they went for Turqueses, and Hides of kine [bison], and other things; and that of all these there was great abundance in this Countrey. Likewise I enquired how, and by what means they obtained these things? They tolde me, by their service, and by the sweat of their browes, and that they went unto the first citie [Hawikuh] of the Province which is called Cevola, and that they served them in tilling their ground, and in other businesses, and that they give them Hydes of oxen, which they have in those places, and turqueses for their service, and that the people of this city weare very fine and excellent turqueses hanging at their eares and at their nostrils. They say also, that of these turqueses they make fine workes upon the principall gates of the houses of this citie. . . . They say, they gyrd themselves with gyrdles of turqueses."

Farther on, the conditions were similar—settlements whose inhabitants were provided with turquois and skins, presumably obtained from Cibola, like the others. In one of the valleys which Fray Marcos entered after leaving Vacupa, probably that of the San Pedro, he found a village whose people "goe in Caconados, that is to say, with Turqueses hanging at their nostrilles and eares: which Turqueses they call Cacona." In describing the costume of the village chief and two of his brethren, he says that they "also were in Caconados, each of them having his collar of Turqueses about his neck: and they . . . offered mee many Turqueses, . . . whereof I would receive no whit."

Crossing the desert in four days' travel, Fray Marcos entered a valley, evidently the Gila, "very well inhabited with people. At the first Village there mette me many men and women with victuals, and all of them had Turqueses hanging at their nostrils and eares, and some had collars of turqueses like those which the Lord of the Village before I came to the Desert, and his two brethren wore: saving that they ware them but single about their neckes, and these people weare them three or foure times double . . . and the women weare of the sayd Turqueses at their nostrils and eares. . . . Heere there was as great knowledge of Cevola, as in Nueva Espanna of Temisti-

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tan, and in Peru of Cuzco. . . .” Fray Marcos traveled for five days in this valley, “and in all these villages, I found very ample report of Cevola, whereof they made such particular relation unto me, as people which go yeerely thither to earne their living. Here I found a man borne in Cevola, who told me that he came thither, having escaped from the governour or Lieutenant of the towne; for the Lord of these seven Cities liveth and abideth in one of those townes called Ahacus [Hawikuh]. . . . He sayeth that . . . the gates, and small pillars of the principall houses are of Turqueses, and all the vessels wherein they are served, and the other ornaments of their houses were of golde: and that the other six Cities are built like unto this, whereof some are bigger: and that Ahacus is the chiefest of them. . . . In this valley I saw . . . farre greater store of Turqueses and chaines made thereof, then in all places which I had passed; and they say, that all commeth from the city of Cevola, whereof they have great knowledge. . . .”

After receiving word of the killing of Estevan, the Barbary negro, Fray Marcos continued his journey. “I followed my way, till I came within sight of Cevola, which is situate on a plaine at the foote of a round hill. . . . The people . . . have Emralds and other jewels, although they esteeme none so much as turqueses, wherewith they adorn the walles of the porches of their houses, and their apparell and vessels, and they use them in stead of money through all the Countrey. . . . They use vessels of gold and silver, for they have no other mettall, whereof there is greater use and more abundance then in Peru, and they buy the same for turqueses in the province of the Pintados, where there are sayd to be mines of great abundance.” Of course, all allusion to precious metals was due to misinterpretation of his Indian informants.

From personal observation and from the reports received by Fray Marcos from the natives en route, there is every evidence that the Zuñi of Hawikuh conducted a considerable trade in turquois with the Indians of southern Arizona and of Sonora at the opening of the historic period.⁸ One need not question the elaborate necklaces obtained in trade from Cibola by these Piman tribes, but with respect

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to the use of turquois to "adorn the walles of the porches of their houses," it is quite evident, from the contradictory accounts of the chroniclers of the Coronado expedition to Cibola in the following year, that Fray Marcos was misinformed by or had misunderstood his native informants. According to Cushing⁹ it was the traditional custom of the Zuñi to ornament their houses in the manner described, but had this been the case, it is strange that it should have been denied by Coronado. Possibly Cushing had in mind the Zuñi tale of "The Maiden of Mátsaki, or the Red Feather," in which it is related that "the priest-chief of Salt City owned many buckskins, and his portholes were covered with turquoises and precious shells."¹⁰

More direct testimony regarding the use of turquois by the Zuñi is given by eye-witnesses who were members of the Coronado expedition which in 1540 followed the trail of Fray Marcos to Cibola. Castañeda, for example, writing of Cibola, says, "There are very fine turquoises, although not so many as were reported [by Fray Marcos]."¹¹

The Viceroy Mendoza, in his letter to the King, April 17, 1540, in which he relates what he had learned about Cibola from various Indians who had been there, says: "They [the women] wear their hair on each side done up in a sort of twist, which leaves the ears outside, in which they hang many turquoises, as well as on their necks and on the wrists of their arms. . . . They were also unable to tell me of any metal, nor did they say that they had it. They have turquoises in quantity, although not so many as the Father Provincial [Fray Marcos] said."¹²

The next direct evidence comes from Coronado himself, in his letter to the Viceroy, written at Granada [Hawikuh], August 3, 1540.¹³ Speaking of the houses of that pueblo, he says, "They are not decorated with turquoises." Later in the letter (p. 558) he writes, "I think that they have a quantity of turquoises, which they had removed with the rest of their goods, except the corn. . . ." Again (p. 561): "Three days after I captured this city, some of the Indians who lived here came to offer to make peace. They brought me some tur-

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quoises and poor mantles, and I received them in His Majesty's name. . . . Afterward, an old man, who said he was their lord [chief], came with a mantle of many pieces, with whom I argued as long as he stayed with me. He said that he would come to see me with the rest of the chiefs of the country, three days later, in order to arrange the relations which should exist between us. He did so, and they brought me some little ragged mantles and some turquoises."

Then follows an important part of the letter (p. 562), in which Coronado announces the sending to the Viceroy of "a cow [bison] skin, some turquoises, and two earrings of the same, and fifteen of the Indian combs, and some plates decorated with these turquoises. As far as I can judge, it does not appear to me that there is any hope of getting gold or silver, but I trust in God that, if there is any, we shall get our share of it, and it shall not escape us through any lack of diligence in the search. . . . Some gold and silver have been found in this place, which those who know about minerals say is not bad. I have not yet been able to learn from these people where they got it."

Touching on the offerings of turquois for religious purposes by the people of Cibola, the anonymous *Relación del Suceso* says: "Their rites and sacrifices are somewhat idolatrous, but water is what they worship most, to which they offer small painted sticks and feathers and yellow powder [pollen?] made of flowers, and usually this offering is made to springs. Sometimes, also, they offer such turquoises as they have, though poor ones."¹⁴ Crudely stated, this describes the present Zuñi custom. The images of the war gods at the shrine on Towayalone (Corn mountain), placed thereon each winter, are adorned with turquois beads, and indeed turquois enters into the decoration of many sacred objects.

With this array of historical testimony respecting the use of turquois by the Hawikuh people when first seen by white men, it was to be expected that excavation of the ruins of their settlement by the Hendricks-Hodge expedition in 1917-1920 would reveal examples of their handiwork in this valued material. We were not disappointed in these expectations, for while there were found no such quantities of worked turquois as the stories of the native informants

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of Fray Marcos de Niza would indicate, we were fortunate enough to recover various examples of beads and small pendants of the solid stone, as well as several hair-combs and ear-tablets, and a breast ornament, all incusted with turquoise on bases of wood. A fragment of a shell, partly covered with mosaic, is exceptional, and will be referred to later.

Aside from a few beads found in the refuse at Hawikuh (as well as at the nearby ruins of Kechipauan, at which limited excavation was conducted in 1919), all the turquoise ornaments were recovered from graves or from sacrificial deposits, usually in such position or under such circumstances as to indicate, in the case of the beads, that they had been strung as ear-loops, necklaces, and bracelets; but in no instance were the beads that had formed necklaces of considerable number, in contrast with the many strands referred to by Fray Marcos in the southern country as having come from Cibola, and which, often interspersed with beads of shell, compose the necklaces of Zuñi men today. In some respects the most curious necklace found was composed of beads of seeds, shell, bone, turquoise, and glass, representing practically all the materials employed at Hawikuh for such purpose.

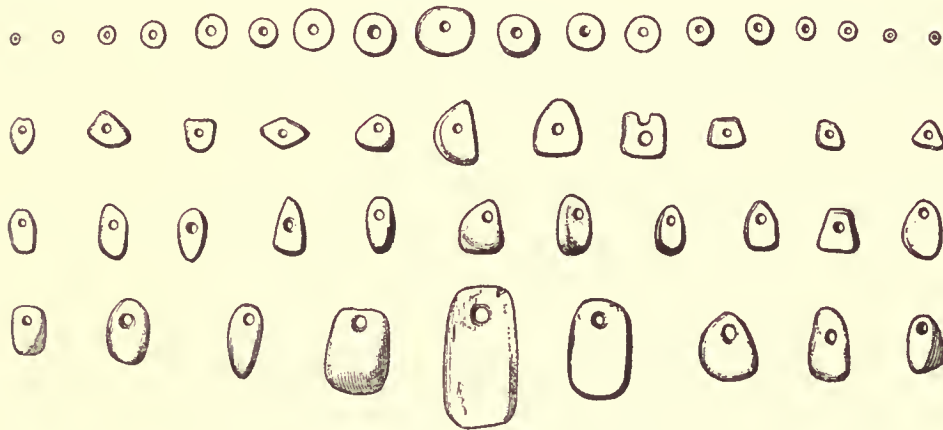


FIG. 1—Beads and pendants. (Actual size.)

The Hawikuh turquoise disc-beads (fig. 1) were doubtless made in much the same manner as at present, except that now a few metal

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tools are employed,—pincers, files, drill-points, and sometimes a length of wire for stringing the tiny discs after drilling, preparatory to grinding to shape. Doubtless in early times the roughing-out was done by chipping with an implement of antler or of bone (instead of with pincers, as at present), the sides flattened by rubbing each bead held in a slight depression cut in a small block of wood, drilled centrally, and then rounded by grinding after stringing. One may readily imagine that the numerous artificially smoothed, flat-topped sandstone masses that protrude above the surface beyond the houses of Hawikuh were utilized in part for this purpose, while certain coping-stones found among the house débris, similarly smoothed by rubbing, were evidently likewise employed.

The turquoise disc-beads of Hawikuh range in diameter from about one-sixteenth to one-fourth of an inch, and in thickness from less than a thirty-second to nearly an eighth of an inch, while the diameter of the drilled holes varies from that so small as to receive merely the point of an ordinary pin, to a sixteenth of an inch.

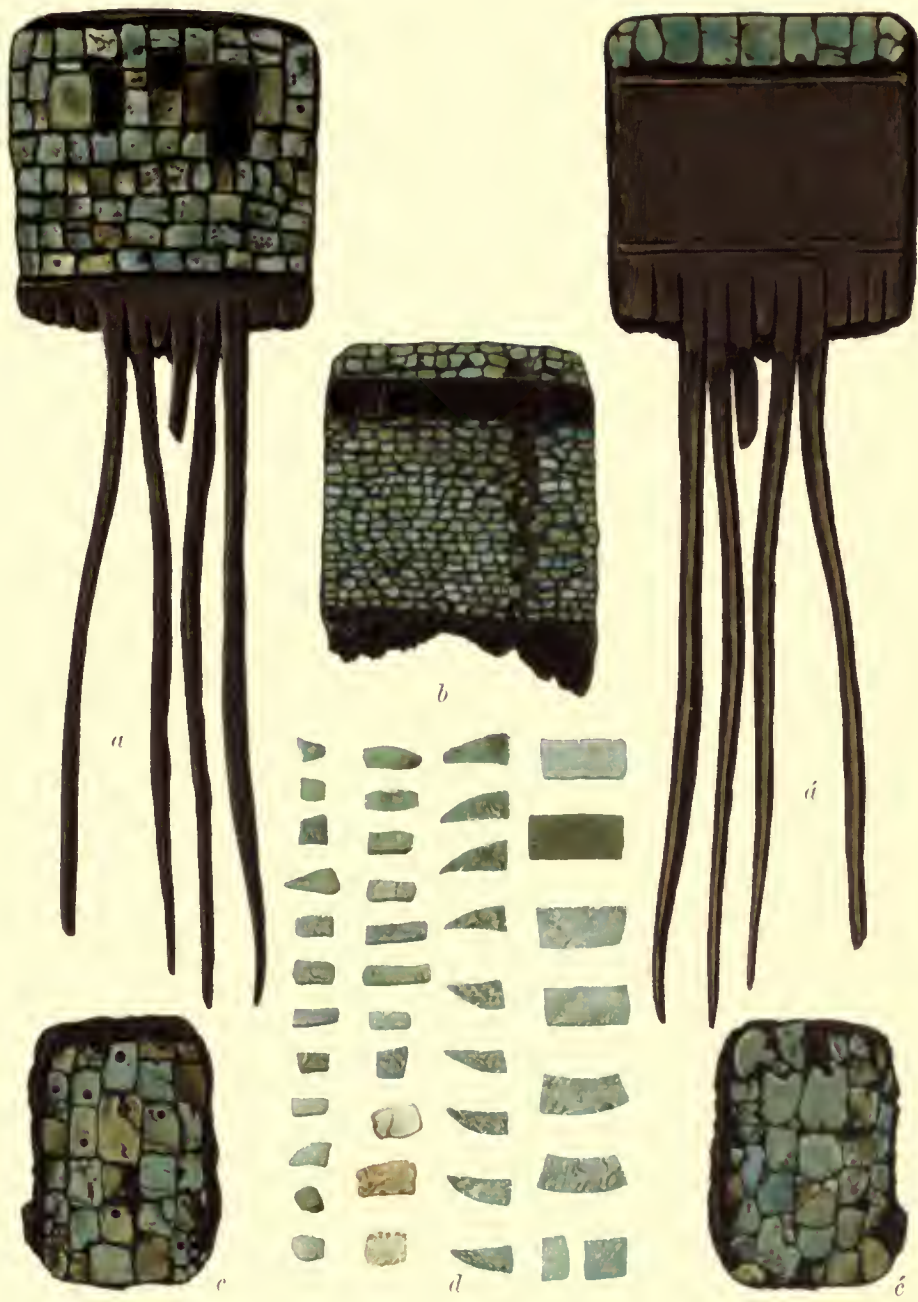
At Kechipauan, however, in one grave there were found about two hundred and fifty beads that had formed a necklace, the smallest of which is less than a sixteenth of an inch, of which diameter the drilled hole covers about a third, or, say, a fiftieth of an inch. How, in primitive times, such diminutive holes were drilled in a stone that is about 6 in the scale of hardness¹⁵ is a mystery, unless one may conjecture that a tiny sliver of obsidian was employed as a drill-point. The use of a thorn, a stem of grass, or a splinter of wood, in connection with fine grit, for such purpose, seems less plausible. Of course, after the advent of the Spaniards and the introduction of iron, drilling of the finest holes should have been and doubtless was done without great difficulty, but many of the smallest disc-beads from both Hawikuh and Kechipauan date from pre-Spanish time, having been found in some of the oldest graves. Doubtless as a rule, if not always, the drilling was done with a pump-drill from both sides, as at Zuñi today, where a file, ground to a suitably fine point, is used. The drilling is made in one face until the point barely penetrates the opposite side, when the bead is reversed and carefully and gently drilled until

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the aperture is sufficiently enlarged. The writer has seen stone drill-points in use at San Felipe for turquoise drilling by means of a pump-drill, but the apertures made were not very small. Fine indeed must have been the medium of drilling employed at Hawikuh and Kechipauan, for in numerous instances the hole is quite cylindrical, while in the case of those doubly conical in cross-section, it is not always possible to say whether this is due to boring from both sides or more or less to abrasion of the string on which the beads were worn.

Small turquoise pendants (fig. 1) also were found with the dead, usually in such position as to indicate that they had been suspended from necklaces. There is no evidence of the wearing of turquoises attached to the nasal septum, as mentioned by the natives through whose country Fray Marcos passed, and there is no likelihood that such a custom was in vogue among the ancient Cibolans, since it is not mentioned by any of the Spanish chroniclers who were actually among them. As at present, little effort was made to give such pendants a conventional form, the main object being to preserve as much as possible of the turquoise; yet for convenience in stringing or suspending them, they were sometimes made more or less triangular, but with rounded corners and edges.

We have alluded to the statements made by the early Spaniards respecting the custom of wearing turquoises suspended from the ears and attached to the wrists, statements verified by our excavations, for in a number of cases remains of ear-loops and wristlets that had been formed of turquoise beads were found, as nearly in position as decay of the supporting strings allowed. There were four instances of the finding of turquoise beads that had formed ear-loops (Burials 35 ♂, 188 ♂, 199 ♂, 1003), and of these all but one (188) were at the position of the left ear. All these skeletons were males, except in the case of No. 1003, the sex of which, owing to the condition of the bones, is unknown; but presumably it was a male also. The exceptional case, where thirty-nine beads were at the right ear, was that of the only skeleton that had been interred in a kneeling posture with numerous other accompaniments, including five white shell beads under the body. A single small turquoise pendant was found near the



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position of the right ear of another skeleton (952, of unknown sex), but this may possibly have slipped from the neck.

In the case of one of the skeletons accompanied with the remains of beaded ear-loops at the left ear, one of them (Burial 35 ♂) had no other articles in association. Another (199 ♂) had been provided with a similar loop, and also a small turquoise pendant at the lower part of the chest, which therefore had probably been suspended from the neck, perhaps attached to a necklace of white shell beads, black stone barrel-shaped beads, and a large number of juniper-seed beads. This man had also been provided with a wristlet or bow-guard for the right hand; it was made of fabric, to which had been attached seven rows of the same kind of barrel-shaped stone beads as those mentioned, interspersed with some shell disc-beads, and some small animal bones, perforated; but bow-guards of various materials, on the right wrist, were not uncommon. Incidentally, it may be mentioned that with Burial 199 ♂ there was an iron hook, probably used as a belt fastener. Burial 1003 had at the left ear fifty-two tiny turquoise beads and also a glass bead, indicating, as in the case of Burial 199 ♂, that the body had been interred during the historic period.

Why the left ear was thus apparently favored is not definitely known, but one is reminded of an analogous Asiatic custom, the men in most parts of Tibet wearing an earring in the left ear only, in the northern part of that country a large gold or silver loop, about two inches in diameter, set with a coral or a turquoise bead.¹⁶ Possibly the preference for ornamenting the left side with turquoise by Pueblos and their ancestors may have had some association with the heart, for even in recent times the Zuñi sometimes embedded a turquoise, symbolizing the heart, in their cradle-boards; and in ancient time stones, presumably turquoise, formed the "heart" of a ceremonial atlatl from the Grand Gulch region of Utah.¹⁷

Not alone was the left ear thus adorned, for the left wrist was similarly favored, almost to the exclusion of the right, so far as turquoise is concerned. With Burial 928 ♂, for example, there were fourteen turquoise beads and a glass trade bead on the left wrist, while,

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strangely enough, with Skeleton 931, of unknown sex, evidently buried at the same time, were the same number of turquoise beads and two glass beads on the right wrist. Burial 234 ♀ had two turquoise beads at the left hand; while in the case of Burial 84 the particular hand was not determinable, as both members were together over the pelvis, and the small disc-beads of turquoise, thirty-one in number, were mingled with their bones.

It is not germane to the present article to enter into a discussion of the occurrence of articles of adornment other than those made wholly or partly of turquoise.

We may mention at this point the appearance in certain graves, and among ceremonial deposits of objects in the cemeteries but not in relation with burials, of various pieces of turquoise, sometimes unworked but usually shaped, indicating the sacred character of the stone. In one instance (Burial 816 ♂ ?) several turquoise settings, as if designed for inlaying, were found grouped closely with three quartz crystals, a small black polished stone, and white paint, surrounded with traces of a skin bag, evidently the "medicine" paraphernalia of the person with whose skeleton it was found. With another burial (865 ♂ ?), in the angle of the right elbow and lying compactly together, were five eagle-claws, five concretions, two projectile points, red hematite paint, several pieces of turquoise, with traces of what appeared to be prayer-meal—a typical outfit of a Zuñi medicine-man. With the remains of a fringed skin bag that accompanied another skeleton (Burial 84 ♂ ?) were thirty-one small turquoise disc-beads; with the remains of another bag, accompanying Burial 30 ♂ ?, there were red paint, a quartz crystal, a piece of turquoise, and the end of a prayer-stick.

Sacrificial deposits in the cemeteries also included turquoises, as for example one (No. 277), comparatively recent, found a foot below the surface, whose component objects, which had been placed in a woven bag, comprised six projectile points, a piece of iron, red and white paint, six pieces of turquoise, a quartz crystal, a concretion, a polished banded jasper pebble, a polished "charm stone" of agate, and some medicine plants. Another such deposit (No. 940), five

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feet four inches beneath the surface, included green and red paint, thirteen turquoise beads that had been strung, a swallow-stick of the Hléwekwe society, a drill-point, and some flint chips. Both of these deposits contained the remains of a considerable quantity of corn-meal, presumably prayer-meal. In none of these instances was it possible to preserve the skeletal remains, by reason of their decayed condition. Still another deposit (1017) possessed all the characteristics of a grave without the human remains—the usual quantity of pottery (in this case of recent glazed ware) broken in sacrifice, much food, green paint, and several shaped pieces of turquoise and jet that evidently had belonged to or were designed for a mosaic ornament.

It has been seen that turquoise objects were in use from the earliest period of Hawikuh until after the coming of the Spaniards and the introduction of iron and other foreign articles. The prehistoric use is further indicated by the finding, in an ancient grave, of a fragment of a bivalve with jet and turquoise inlaid in alternating bands—the only object of its kind unearthed—and by the occurrence, in two instances (Burials 732, 959), of worked turquoise among cremated human remains deposited in unquestionably ancient jars. That turquoise was used at Hawikuh after the coming of the Spaniards is evident from the historical references already quoted, even if it had not been found in association with burials whose recency was beyond question.

We cannot enter at this time into a discussion of the chronological sequence of the pottery of Hawikuh, but it may be stated briefly that the particular cremations referred to were two among hundreds that had been deposited in vessels of a much earlier period than the bowls and jars with the crude glazed decoration often found in association with Spanish objects; moreover, many of these incinerary vessels were unearthed from pits that had been dug and filled before the later inhabitants of Hawikuh commenced to throw the refuse of the village, largely ashes, beyond its northern walls, where it had accumulated to a depth of nearly ten feet. In no instance was an object of European origin found in connection with cremated remains.

With respect to the incrustated shell, it was found in an undoubtedly

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old grave (No. 802) of a young adult on the eastern slope of the pueblo, three feet seven inches beneath the surface, and directed northwardly. Under the bend of the knees, which were greatly flexed to the right, were parts of three ancient bowls of creamy ware with dark green decoration. The principal part of the ornament (pl. I, *d*) lay on the chest, while other fragments (pl. II, *d*), consisting of shaped pieces of turquoise (triangular, oblong, rounded keystone) and jet, together with a piece of the shell, were scattered at intervals as far as the knees. At the lower part of the chest was a portion of a jet bird ornament, while the other part was found near the pelvis. Evidently the mosaic ornament had been a gorget, as shown by the hole drilled for suspension. Enough of the object remains to warrant conjecture as to the original shape of the shell, but as it had probably once been entirely incusted, the pattern of the complete design can only be surmised. It seems apparent that this ornament, as well as the jet bird, had been destroyed for sacrificial reasons, as was the case with so many of the pottery vessels and other utilitarian objects found in graves. Careful sifting failed to reveal more than a comparatively small portion of the inlays, and only those parts of the shell shown in the illustration, no doubt for the reason that, as often was the case of the mortuary pottery, it had been broken on the surface and only a part cast into the grave. The convex or outer surface of the shell is very slightly ridged, hence to produce a more even surface the elevated portions were somewhat rubbed down by the maker of the mosaic.

This specimen of mosaic-work on shell is unique among the collections of Hawikuh, all the other incusted objects being on wood, as above indicated. In the article on Hawikuh Bonework¹⁸ mention is made of a pendant of burned bone found among the charred refuse surrounding various cremations beneath the northern refuse-heap of the pueblo. It is carved with a raised framelike border and is perforated at the top, and in all probability once held a mosaic, but none of the settings was present. Like the shell mosaic, it is the only specimen of its kind recovered.

Most numerous of all the mosaic ornaments are those with bases of wood and consisting of ornamental hair-combs worn by women, and

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tablets that had been suspended from the ears of the same sex, a brooch or breast ornament, and what had probably been a device for attachment to a belt, if we may judge by the position in which it was found.

The most perfectly preserved of the combs (for all were in a more or less decayed condition when recovered) is $5\frac{3}{8}$ inches long, and originally was provided with twelve teeth, of which four on one side and two on the other had been broken off and the upper ends cut smooth (pl. II, *a, a'*); of the remaining teeth the two central ones are partly missing, while the other four are fairly intact. The mosaic upper or body portion, which is slightly convex, measures $1\frac{5}{8}$ inch in width at the middle and nearly $1\frac{1}{2}$ inch from top to bottom, not including the lower wooden part, flush with the mosaic, from which the teeth project. The upper margin of the wooden base is not and probably was never inlaid, but is slightly lower than the rest of the face of the comb. The settings are rather neatly laid and consist not alone of turquois, as there are three pieces of black material, two of them resembling slate, the other like jet or lignite, which probably it is. No attempt was made by the maker to smooth the face of the mosaic by rubbing. Several of the settings evidently had served previously as beads, as they are drilled. The wooden base on which the mosaic is laid is approximately an eighth of an inch in thickness, while the layer of gum (probably that of the piñon) in which the settings are imbedded is as thick as the settings themselves, namely, nearly a sixteenth of an inch. The rear side of the body is slightly concave, and as on the face, though more definitely, the extension of the lines separating the teeth are neatly scored, almost meeting a double horizontal line half an inch above the remaining teeth. Above this double line the concave body of the comb is seven-eighths of an inch high, ending at another depressed line, adjoining which is a band of inlaid turquois a quarter of an inch wide and extending practically the entire width of the comb, here nearly $1\frac{5}{8}$ inch.

This attractive ornament, no doubt similar to the combs which Coronado despatched to the Viceroy Mendoza with his letter of August 3, 1540, as before mentioned, was found in the western ceme-

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tery with a disintegrated skeleton, presumably of a woman, headed eastwardly, at a depth of four feet six inches (Grave 23). The comb was found under the right side of the skull and protruded slightly beyond. With the bones of the left hand were five rings made from sections of the seed-pod of the unicorn plant or devil claw, such as were found with other skeletons.

We may mention here the interesting circumstance of the finding, in connection with this and with similar ornamented combs at Hawi-kuh, of at least one bezoar (*ä'kesine*), placed at the top of the comb, as if forming a part of it; indeed, when first exposed, it was thought to be a rounded extension of the wooden part of the comb itself. In all these instances the bezoars consist of indurated masses of hair, and they were recognized by the older Zuñi men as being derived from the stomachs of deer, but the reason for their association with combs

was not understood by them. Bezoars were found also at other parts of skeletons, in two cases near the pelvis; but these were exceptional, and in a number of cases they were observed at the back of the head without the presence of combs, as if used alone as hair ornaments. A notable instance of the presence of bezoars in association with an interment was that of Burial 234, an adult, directed northwardly, seven feet down, with the skull lying on the left side. At the back of the skull there were three bezoars, and three others lay under the left side. Touching one of them at the occiput was the mosaic hair-comb shown in plate I, *b*. There were



FIG. 2.—Bezoar found in contact with the mosaic comb accompanying Burial 102 ♀.

other instances in which two or three bezoars projected upward from the skull like horns. A bezoar found in association with the mosaic comb from Burial 102 ♀, next to be described, is shown in the accompanying figure 2.

A smaller inlaid comb, the five teeth of which are all present, is shown in plate I, *a, a'*. Its total length is 4 inches, while the upper or incrustated portion measures $1\frac{3}{8}$ inch wide and $1\frac{1}{8}$ inch high. The third row of the mosaic from the top consists of a single piece of

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lignite, which to the Zuñi is as precious as the turquoise; indeed, they call it *hliakwin*, "black turquoise." Like the other comb described, some of the turquoise settings are used secondarily, five of them having once served as beads, as shown by the drilling. The thickness of the settings, both turquoise and jet, is only about a thirty-second of an inch; they are set on a wooden base averaging about an eighth of an inch in thickness. The reverse of the comb, like that of the other, is ornamented, in this instance with two rows of turquoise made up in the main of rather irregular scraps, including parts of two beads.

This comb was found with a skeleton (102 ♀) in the western cemetery, which was buried extended on its back at a depth of four feet six inches, with the head directed eastwardly. The comb was above the position of the right ear, with its teeth pointed backward; but from observations on the position of combs subsequently found, it is evident that at the time of burial, as during life, such objects were worn upright in the hair-knot at the back of the head. At the position of each ear of the same person was a turquoise mosaic tablet (which will be referred to later), and on the chest a red jasper projectile point that no doubt had been suspended from the neck, as is the custom of some men at Zuñi today. At the pelvis were the remains of a skin bag that had contained green and blue paint.

In connection with this burial it is interesting to note that the skull exhibited distinct evidence of face-painting in black under the left eye, across the nose, and the lips. So sacred (*téhya*) was this skull regarded by the native workmen, and so earnestly did they plead for its reburial, that their wishes were fulfilled, much to their relief. The sex of this personage was not determined, but from the fact that it was accompanied with a mosaic hair-comb, it doubtless was that of a woman.

The smallest mosaic comb, with two or three of the teeth decayed away when found with Burial 920 ♀, measures only $2\frac{3}{4}$ inches in length, the incrustated body portion being fifteen-sixteenths of an inch square (pl. I, c). The turquoise settings are more neatly shaped and regularly laid than in the case of the two combs described, and no

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beads enter into the mosaic. Occupying a considerable part of the area of incrustation is a T-shaped figure made up of three squared pieces of jet and not improbably designed to represent a conventionalized bird. A few of the turquoise settings at the left and top, as well as the wooden part supporting them, had disappeared when the comb was unearthed from the back part of the skull of the woman which it accompanied, in such position as to indicate that it had once stood erect in the rear hair-knot. The reverse of the comb is not ornamented. The skull reposed on its left side, and at the position of each ear was a mosaic ear-pendant, that of the left side having turned face inward, probably when the body was placed in the grave. There were numerous other objects with this burial, but we need here mention only two polychrome bowls—one, resting partly on the skull, with a bear-paw painted within; the other, inverted over the left upper arm and shoulder, with the figure of a bird in flight, recognized by the Zuñi as a goldfinch (*ónahlikya*).

This burial was uncovered in the refuse of the northern cemetery at a depth of six feet six inches, or fifteen inches below the maximum depth at which foreign objects were found here; hence we may reasonably believe the burial to have been made in pre-Spanish time. As in the case of so many of the older burials, the direction of the skull was northwardly, whereas the more recent interments almost invariably were with the head directed toward the east.

The smallest of the approximately complete hair-combs, found with Burial 234 ♀, above referred to, is about $3\frac{1}{4}$ inches in length, while the ornamented oblong portion, consisting of turquoise pieces only, is $1\frac{1}{8}$ inch wide by eleven-sixteenths of an inch high (pl. I, *b*). In this case an attempt was made to ornament the side edges with bits of turquoise. Four beads are among the settings. The reverse of the comb is not incrustated.

This comb was found in the usual position at the back of the woman's skull in association with a small mass of strings that evidently had been a hair-tie, and the six bezoars above described, one of which was in contact with the top of the comb. Incidentally it may be men-

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tioned that among the finger-bones of the left hand were the two turquoise beads of irregular form to which reference has been made.

What must have been an attractive comb, of the teeth of which only a suggestion remains, is that illustrated in plate I, *g*. The incrustated part is $1\frac{1}{2}$ inch wide and $1\frac{3}{8}$ inch high, and is composed of a row of turquoise settings, followed by a band consisting of seven squared pieces of lignite, then nine rows of turquoise. As in the other ornaments of the kind, several beads compose part of the mosaic. The face of the comb is slightly convex, and the reverse, which is without decoration, is correspondingly concave, but this is probably due to warping during the many years the object was buried. The body of the comb is of the same approximate thickness as the others.

During the excavations in the Hawikuh cemeteries our observations were often made difficult by the burrowing of prairie-dogs, which in numerous instances had passed entirely through graves, displacing the burial accompaniments and sometimes destroying the bones. Strangely enough, however, this destructive work was probably more than compensated by the aid these marmots rendered, especially after rains, when they are wont to do much of their digging. It was on several such occasions that prairie-dogs brought to the surface in unexpected places telltale objects that were the means of revealing interesting graves through digging on our part. It was in this way that we discovered some tiny worked settings of turquoise, together with bits of human bone (Burial 257), in sand that had been freshly thrown out of the burrow by a prairie-dog after a rainy spell. By extended digging and much sifting, nearly if not all the pieces of this mosaic were recovered, enabling identification as the fragments of a comb similar to the others described, but perhaps of somewhat finer workmanship, if we may judge by the neatness with which the settings are shaped. There were no pieces of jet with these.

Without special significance, but worthy of record, is another comb, consisting of the incrustated part only, in two pieces, owing to the advanced state of decay when it was found with Burial 915 ♀. This interment in the northern cemetery, six feet five inches beneath

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the surface, was regarded by our Zuñi workmen as that of a priestess, by reason of the character of many of the unusually large number of objects that had been deposited in the grave, including a variety of medicines. In this case the comb rested partly on the vertebræ near the lower end of the sternum, which had become displaced, and indeed the entire skeleton had been crushed by the weight of the earth above. It was apparent that the comb had been deposited in the grave with the other objects, and had not been thrust in the hair-knot as in the other instances described. It may be mentioned that most of the hair was still preserved beneath the skull, and that the skeleton of a fetus was present. The mosaic of the comb referred to includes the usual turquoise beads.

Of the mosaic incrustated hair-combs there remains to be described one, minus the teeth, which, in so far as the diminutive size of the settings is concerned, is the best example recovered (pl. II, *b*). The incrustated portion is almost exactly $1\frac{1}{2}$ inches square, and consists of three rows of tiny bits of turquoise at the top, a band composed of three squared pieces of jet, followed by eighteen rows of turquoise settings similar to the upper ones. All the pieces composing this mosaic are very small, the smallest indeed showing less surface than that of a pinhead. Whether the reverse side is incrustated, as in the case of two of the other combs, is not known, as the condition of the object was such that, to enable its preservation at all, a portion of the occiput of the skull to which it adhered was cut away and the comb is still fastened firmly to it. The largest of the three pieces of jet forming the band near the top is higher than the others, and a fissure extends from top to bottom of the face, owing to the decay of the wooden base; indeed, as soon as the object was exposed to the dry air, disintegration commenced, necessitating immediate treatment with paraffin.

This comb was with Burial 198 ♀, three feet seven inches down, headed eastwardly and extended on its back. Above the right ear lay the comb, and projecting upward from the top of the skull, like horns, were two bezoars.

Indicating either the paucity of turquoise or the poverty of the own-

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ers, was the occurrence of two wooden hair-combs, one of them incomplete and in fragments, similar to the others in all respects excepting that they lack the mosaic, and there is no certainty that they ever had been incrustated. One of these was found with Burial 927 ♀, seven feet four inches beneath the surface in the northern cemetery, which was accompanied with many other objects of truly aboriginal character, including a bezoar at the back of the skull, but not in contact with the comb. This comb was found in the hair, still partly preserved, about six inches from the skull, evidently having been displaced at the time of or after burial.

The other wooden comb (fig. 3), in fairly perfect condition, accompanied Burial 91 ♀, found five feet under the surface in the same cemetery, and likewise had in association many objects used by women; but a foot above the skeleton was a piece of sheet-copper, and at the same level as that of the skeleton, although not with it, other intrusive objects were encountered, showing its probable interment during the historic period. This comb is $4\frac{3}{4}$ inches long, and its upper portion measures seven-sixteenths of an inch wide by seven-eighths of an inch from the grooves between the teeth to the top. Five-eighths of an inch from the top and extending horizontally from edge to edge is a slightly raised band, an eighth of an inch wide, while much narrower bands are visible midway of the length of two of the teeth. Possibly the band on the upper part was designed as a border for the lower edge of a mosaic, but if this were the case there is no sign of incrustation now. With this comb was found a bezoar, rising from its top as if once attached thereto. Indeed the top of the comb is not finished so smoothly that such attachment would be unlikely.

An unexpected turquoise mosaic with Burial 198 ♀ was a tablet



FIG. 3—Wooden comb without mosaic, but having bezoar in association. (Length of comb, $4\frac{3}{4}$ in.)

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similar to the ear-pendants to be described, adhering to the under side of one of the ribs, at the right, as if it had been attached to a belt. This piece of mosaic, therefore, was recoverable only in fragments.

We have already referred to the turquoise "plates" which were among the objects sent by Coronado from Hawikuh to the Viceroy Mendoza in 1540, but it was doubtful what these objects really were until the mosaic ear-pendants and a breast ornament, or brooch, were unearthed. Allusion has been made to the ear-tablets found with Burial 102 ♀, whose skull bore traces of painting. A description of one of these pendants (pl. I, *f*) will serve for both. It is decidedly convex on the face, and correspondingly concave on the reverse side, due probably to warping of the wooden base; it measures nearly seven-eighths of an inch wide by $1\frac{1}{4}$ inch high, and is composed of nine rows of turquoise, evenly set in the gum. The thickness of the settings is only about a thirty-second of an inch, while the entire thickness of the pendant is a sixteenth of an inch. Between the first and second rows, midway between the sides, is a small hole for suspension. As in the case of the combs, beads or parts of beads have been utilized in the inlaying.

The pair of mosaic ear-pendants referred to in the description of the hair-comb found with Burial 920 ♀ are identical in size, being 1 inch wide and $1\frac{3}{16}$ inch high, and are perforated for suspension close to the upper margin. The wooden base of these ornaments is well preserved, and the settings seem as firm as when the pendants were in use. As usual, parts of beads compose some of the settings (pl. I, *e*).

Ear-pendants practically identical in character are sometimes worn by Zuñi women on gala occasions at the present time, although they have been superseded largely by silver earrings, often studded with turquoise. Specimens of such modern ear-pendants, cemented to bases of wood with piñon gum, are in the Museum of the American Indian, Heye Foundation; but the workmanship is decidedly inferior to that of the ancient Zuñi of Hawikuh, the settings being placed without regard to regularity or without attempt to grind them to

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shape, while to meet the paucity of turquoise, small trade beads of blue glass are used in each of the three specimens mentioned.

Unique among the mosaic objects of Hawikuh, and of unquestioned recency in the history of the pueblo, is an interesting though rather clumsily made ornament, 1 inch wide by $1\frac{1}{2}$ inch long, and of a maximum thickness of three-eighths of an inch, without perforation for suspension (pl. II, *c, c'*). Having the appearance of two ear-pendants cemented together back to back, the faces of the object are made up of turquoise settings that evidently had been used primarily for other purposes, included among which is an unusual number of beads or fragments of beads, those showing perforation numbering seven on one side and ten on the other. This ornament was found on the chest of a child buried beneath the floor of the church, no doubt built in 1630, the skeleton (Burial C 40) being notable from the fact that it was one of only three among the many unearthened from under the chapel floor that were accompanied with artifacts of any kind. With the second of these (C 37) there was a wooden cross, held in the right hand on the right side of the chest; and with the third (C 38) were two small copper or brass pins on the chest, but no traces of clothing.

Numerous objects incrustated with turquoise and jet, sometimes with other stones, have been found at ancient pueblo sites in New Mexico and Arizona, especially by Pepper, whose writings on the subject have been cited, and by Fewkes.¹⁹ All of these, however, are on bases of shell, lignite, bone, or pottery, and in a single instance, found by Pepper in Chaco cañon, on basketry. Indeed, there is no known mosaic on wood aside from those from Hawikuh, herein described. Moreover, in none of the other ruins have incrustated hair-combs thus far been found, hence in such objects Hawikuh stands alone. A unique inlaid object from the lower Mimbres valley, New Mexico, now in the Museum of the American Indian, Heye Foundation, consists of a tempered clayey composition, brooch-like in form, at each of the four corners of which are embedded a rudely rounded red stone surrounded with small turquoise settings.

There is good reason for believing that all the ruins referred to, at

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which mosaic objects have been found, are older than Hawikuh, not alone because wood will not withstand the ravages of time so well as shell and bone especially, but because there is substantial evidence that at Hawikuh the use of mosaics on wood was commenced in late prehistoric time and was continued until its abandonment in 1670; whereas all the other pueblos from which incrustated work has been recovered had fallen into ruins before the advent of the Spaniards in the Southwest about the middle of the sixteenth century. In this statement we do not include the occurrence of the fragment of the mosaic-covered shell at Hawikuh, which unquestionably dates from a period earlier than late prehistoric.

F. W. HODGE.

NOTES

¹ Mylius quoted by Pogue, Joseph E., *The Turquoise, Memoirs of the National Academy of Sciences*, vol. XII, pt. ii, 3d memoir, p. 17, Washington, 1915.

² Jones, Fayette Alexander, *New Mexico Mines and Minerals*, pp. 267-277, Santa Fe, 1904. Pogue, *op. cit.*, pp. 52-58, and bibliography.

³ See Bandelier, Final Report, pt. 1, *Papers of the Archaeological Institute of America, American Series*, III, p. 163, Cambridge, 1890: "The Tanos held the veins of turquoise, or kalaite, at the Cerrillos, about twenty miles southwest of Santa Fe." *Ibid.*, pt. 2, *American Series*, IV, p. 93, Cambridge, 1892: "The Tanos of Santo Domingo regard themselves as the owners of the [Cerrillos] site and visit it frequently to procure the stones that are so much esteemed by them." San Marcos, a former Tano pueblo, is known to the Tewa by a name which signifies "Turquoise pueblo." See The Memorial of Fray Alonso Benavides [1630], p. 230, Chicago, 1916; also Harrington, Old Indian Geographical Names around Santa Fe, New Mexico, *American Anthropologist*, vol. XXII, pp. 354, 359, October-December, 1920.

⁴ Pepper, George H., Ceremonial Objects and Ornaments from Pueblo Bonito, New Mexico, *American Anthropologist*, vol. VII, pp. 183-197, Lancaster, 1905; The Exploration of a Burial-room in Pueblo Bonito, New Mexico, *Putnam Anniversary Volume*, pp. 196-252, New York, 1909; also personal information by Mr Pepper.

⁵ Matthews, Washington, Navajo Silversmiths, *Second Annual Report of the Bureau of Ethnology*, p. 171, Washington, 1883.

⁶ Cushing, F. H., Zuñi Fetiches, *Second Annual Report of the Bureau of Ethnology*, p. 26, 1883; Cushing, Outlines of Zuñi Creation Myths, *Thirteenth Annual Report of the Bureau of Ethnology*, p. 369, 1896; Cushing, Zuñi Folk Tales, pp. 1, 40, 140, 288, 384, 388, New York, 1901; Cushing, Zuñi Breadstuff, *Indian Notes and Monographs*, vol. VIII, Museum of the American Indian, Heye Foundation, 1920; Stevenson, M. C., The Zuñi Indians, *Twenty-third Annual Report of the Bureau of American Ethnology*, p. 58, 1904. Pogue (*op. cit.*) has brought together many references to the use of turquoise among the Pueblo tribes and their beliefs respecting it.

⁷ Hakluyt, Richard, *The Principal Navigations, Voyages, Traffiques & Discoveries of the English Nation*, vol. IX, pp. 125-144, Glasgow, 1904.

⁸ "There existed, in 1539, and prior to it, quite an intercourse between Zuñi and the land-tilling aborigines south of the Gila River. That intercourse took the form of journeys made by the Opatas, the Southern and Northern Pimas, and possibly the Eudeves and Jovas, to Cibola-Zuñi, for the purpose of acquiring turquoises and buffalo hides, in exchange for which they gave parrots' feathers, and probably sea-shells, or which they earned by working for the Indians of Zuñi. No mention is made of the people of Cibola visiting those of the south, which is quite natural, since buffalo hides and turquoises were more important to the latter than plumes and shells were to the former."—Bandelier, *Outline of the Documentary History of the Zuñi Tribe, Journal of American Ethnology and Archaeology*, vol. III, pp. 3-4, also p. 43, Boston and New York, 1892. It will be recalled also that, after his wanderings among the tribes of Texas and during his journey to Mexico City,

NOTES

Alvar Nuñez Cabeza de Vaca, while in Sonora, was presented by the natives with "many good turquoises, which they get from the north; they finally gave us all they had; and Dorantes they presented with five emeralds, shaped as arrow-points, which arrows they use in their feasts and dances. As they appeared to be of very good quality, I asked whence they got them from, and they said it was from some very high mountains toward the north, where they traded for them with feather-bushes and parrot-plumes, and they said also that there were villages with many people and very big houses."—*The Journey of Alvar Nuñez Cabeza de Vaca, 1528-1536*, translated by Fanny Bandelier, pp. 156-157, 177, New York, 1905.

⁹ Winship, G. P., the Coronado Expedition, 1540-1542, *Fourteenth Annual Report of the Bureau of Ethnology*, pt. 1, p. 357, Washington, 1896.

¹⁰ Cushing, Zuñi Folk Tales, p. 1, New York, 1901.

¹¹ Castañeda's Narration in Winship, op. cit., p. 518.

¹² Winship, op. cit., p. 549.

¹³ Ibid., p. 558.

¹⁴ Ibid., p. 573.

¹⁵ Pogue, op. cit., p. 24. "Turquoise is about 6 in the scale of hardness. . . . The hardness of turquoise is not absolutely uniform and depends upon its texture, chemical condition (whether silicified, unaltered, or altered), etc. Some vein turquoise is slightly above 6 in hardness, but the average cut-stone is perhaps a trifle under 6."

¹⁶ Laufer quoted by Pogue, op. cit., p. 78.

¹⁷ Culin, Stewart, an Archæological Application of the Röntgen Rays, *Bulletin 4, Free Museum of Science and Art, University of Pennsylvania*, Philadelphia, June, 1898. Pepper, the Throwing-stick of a Prehistoric People of the Southwest, *Transactions International Congress of Americanists, 1902*, pp. 114-115, Easton, Pa., 1905.

¹⁸ Hodge, F. W., Hawikuh Bonework, *Indian Notes and Monographs*, vol. III, no. 2, p. 146, pl. liii, d, New York, 1920.

¹⁹ *American Anthropologist*, vol. IX, no. 11, Washington, 1896; *Seventeenth Annual Report of the Bureau of American Ethnology*, pt. 1, 1898; *Smithsonian Report for 1896*, pp. 517-539, 1898; *Twenty-second Annual Report of the Bureau of American Ethnology*, 1904.

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