Stone Disks in Iroquoia

By William Engelbrecht, Kathleen Allen, Bill Fox, Jim Herbstritt, Joshua Kwoka, Wayne Lenig, and Martha Sempowski

Abstract

Iroquoian speakers played the hoop and pole game, but there are no historic descriptions of Iroquoians playing chunkey, a variant of hoop and pole in which a rolled stone disk is used instead of a hoop. Also, no distinctively shaped Cahokia style chunkey stones have been found on Iroquoian sites. This has led to the belief that chunkey was not played by Iroquoians. However, a symmetrical stone disk that rolled well across a carpeted surface was recovered from the Eaton site, a mid-sixteenth century Erie village. Other researchers provided examples of symmetrical stone disks from Neutral, Erie, Seneca, Cayuga, Mohawk, and Susquehannock sites. These specimens generally resemble the Bradley variant of chunkey stones from the Midwest. We argue that these Iroquoian stone disks were used to play chunkey. In addition to describing the physical characteristics of the specimens, we discuss possible symbolism and functions of the game among Iroquoians and likely reasons for its disappearance.

Chunkey, and “Hoop and Pole”

Chunkey is a game that involves rolling a stone disk known as a chunkey stone or discoidal along a flat surface. The name comes from the Choctaw, chungke (Adair 1775:401). It is a variant of
the hoop and pole game which was played throughout North America (Culin 1907:420-422). Both games could be played by two players or by teams. The Iroquois called hoop and pole the game of javelins (Morgan 1851:298-301; Williamson and Cooper 2017:58) (Figure 1).

In this game a player rolls a hoop or disk and another player throws a pole or throws or shoots an arrow at the hoop or disk. Points are scored by how near to the target the pole or arrow lands. Culin (1907:420) states: “The game is remarkable for the wide diversity in the form of the implements employed, as well as in the method of play.” Hoops could be made of “wood, bark, corn-husk, pottery, or stone” (Culin 1907:420-421; DeBoer 1993:83). Zych (2017:65) notes that some cultures gave different terms to contests using a stone disk versus a hoop. Culin (1907:461) cites an 1811 visitor to the Arikara who said that a version played with a ring (presumably stone) was a more violent game than one using a hoop. However, most accounts suggest that hoop and pole and chunkey are essentially variations of the same game, differing only in whether it was a hoop or stone disk that was rolled. We therefore apply the symbolism attributed to the hoop in historic times to chunkey stones.

Archaeologists have focused on the game of chunkey rather than hoop and pole due to the preservation of chunkey stones. The earliest stone disks appear in western Illinois and

Figure 1. “Iroquois Game of Javelins,” Jesse Cornplanter, 1903.
eastern Missouri around A.D. 600 (Pauketat 2009a:44). These are less finely crafted than the biconcave (discoidal) specimens associated with Cahokia and related Mississippian ceremonial centers. When Mississippian centers disappear, chunkey appears to be to be largely replaced by lacrosse in the Midwest (Pauketat 2009b:25). However, stone disks are occasionally found in later sites where they are typically biconvex in shape, the Bradley type (Perino 1971) (see Figure 2). Chunkey continued to be played in the Southeast into the eighteenth century (Zych 2017:65) and by groups on the Plains into the nineteenth century (Catlin 1989:134).

It is assumed currently that the Iroquois did not play chunkey (George 2001:1). “North of the core Mississippian world no local varieties of chunkey stones have been found” (Pauketat 2009b:24-25). Ethnohistoric accounts of Iroquois chunkey are lacking. However, nineteenth and early twentieth century scholars of the Iroquois suggested that some stone disks recovered from Iroquois sites were gaming stones. Beauchamp (1897:32, figure 62), Parker (1920:421, nos. 3 and 6) and Squier (1849:79, fig.24) illustrate stone disks that appear to be chunkey stones. Squier (1849:79) compares the stone disk he illustrates to those in the Mississippi Valley.

There are two twentieth century references to the Iroquois playing a “rolling stone” game, but the game is not described. In 1926 Arthur Parker (1967:68) noted that the Seneca played a “rolling stone” game as did William Fenton (1933-
1938) in his Seneca field notes (Denis Foley, personal communication). While it seems likely that they were referring to chunkey, the Creeks played a game, “rolling the stone,” which involved rolling a large marble or bullet along a trench and trying to make it land in one of several hollows (Swanton 1942:684). Hudson (1976:425-426) suggests that a small soapstone ball or possibly a small disk was used in this Creek game. Contemporary Cherokee call the game “marbles” and use billiard balls (Cherokee Nation website). A few spherical stone balls have been recovered from Iroquoian sites which could have been used in a game, but documenting these is beyond the scope of this paper.

We classify hoop and pole and chunkey as games, but these activities were more than that to the participants. They were imbued with a sacred quality (Culin 1907:34) and to play them was to engage in a spiritual act. For Native Americans, engaging in many sports was seen as advancing an end such as healing the sick, bringing rain, or bringing success in war or hunting. Success in a game also demonstrated that an individual possessed spiritual power. This spiritual connection enhanced the importance of these activities to the participants (Oxendine 1988:6). Frequently, but not always, gambling was associated with the outcome of the hoop and pole game (Culin 1907:422) and we may assume that this was the case with chunkey. This would have resulted in the redistribution of goods within and between communities, operating over the long term as a leveling mechanism (Aveni 2010; Williamson and Cooper 2017).

Fenton (1936:8-9) noted that at the Seneca Coldspring Longhouse (Allegany Territory), the hoop and pole game was played in the hope of bringing rain as part of the Thunder Rite. It was played by moieties, one representing the sun and one a shaman, though Salter (1971:72) suggests that earlier the moieties may have represented the sun and moon. Fenton (1936:9) states that the game was an appeal to the sun and the moon. Tooker (1970:34) notes that there were once separate
ceremonies for the sun and moon, but as these became obsolete, she suggested that the appeal to the sun and moon was appended to the Thunder rite. The moiety representing the sun had the first roll toward the west (Fenton 1936:9). Fenton (1936:17) also notes that hoop and pole, along with a number of other games, might be played in response to a dream.

It is likely that well-made stone disks were seen as possessing spiritual power. Pauketat (2009a:43) likens the chunkey stone rolling across the playing field to the sun moving across the sky. A chunkey stone can therefore be viewed as representing a celestial object and therefore a microcosm of the cosmos (Pauketat 2009:43). The hoop or chunkey stone thus represented “the upper world.” Like hoop and pole, throwing a pole at a rolling disk can be also interpreted sexually and thus be related to creation, fertility, and rebirth (DeBoer 1993:83, 85; Pauketat 2009a:43).

Stone Disks in Iroquoia

In 1999 a symmetrical stone disk was recovered from the plow zone of the Eaton site, a multi-component site located in West Seneca, New York, just south of Buffalo (Figure 3). As an experiment, the disk was gently rolled along a long sloped carpeted incline designed for wheel chair access. It rolled smoothly and in a straight line for a considerable distance before eventually curving. This led William Engelbrecht to hypothesize that it could have been used in chunkey or a similar game.
For this study, eight archaeologists working with Iroquoian material in different areas were contacted by Engelbrecht and asked if they knew of any circular stone disks that had been found in their area. No attempt was made to survey all Iroquoian territories. Six archaeologists reported back positively and joined the study, providing a total sample of 66 specimens, both whole and broken. These specimens are described in a table uploaded to tDAR. We regard these specimens as likely candidates for chunkey stones, but we cannot prove that all of them were used for that purpose. The authors chose only the most symmetrical stone disks for inclusion in this study. Whole specimens from Erie, Seneca, Cayuga, and Mohawk sites were rolled successfully. See Figure 4 for a location of Iroquoian territories discussed in this paper.

![Map showing Iroquoian territories](image)

*Figure 4.*

This study was undertaken to see if symmetrical stone disks were found on other Iroquoian sites beside Eaton. It should therefore be regarded as preliminary, not an exhaustive listing of all possible chunkey stones in Iroquoia. Recently, Jennifer Birch reported seeing two probable chunkey stones from the Onondaga
sites of Burke and Schoff while examining collections at Syracuse University and Ellie McDowell-Loudan reported possible chunkey stones from sites in Cortland County. However, neither Onondaga nor Oneida collections were systematically examined for possible chunkey stones. There are also published illustrations of probable chunkey stones such as a "grindstone" illustrated by Tremblay (2006:48) from the Lanoraie site (St. Lawrence Iroquoian) in Quebec. Additional data and images pertaining to many of the specimens in this sample may be found on the Digital Archaeological Record (tDAR) under the “Iroquoian Chunkey Stones” collection, I.D. 67177 (https://core.tdar.org/collection/67177/iroquoian-chunkey-stones).

Neutral

William Fox observed a discoidal stone from the Lake Medad Neutral site, ca. 1630 - 1650, north of Hamilton, Ontario in the collections of the Smithsonian National Museum of the American Indian (Figure 5). It exhibits central depressions on either face that are approximately 1.2 cm in depth. There are several more pierced circular stones in the collection from Lake Medad, one of which may have functioned as a small chunkey stone.

Figure 5. Lake Medad site, Neutral.
Erie (western New York)

Both the Eaton and Simmons sites are believed to be Erie villages. The Iroquoian village component at Eaton dates to approximately A.D, 1550. The specimen from Eaton was identified by Elisa Bergslein and Gary Solar of the Earth Sciences Department at SUNY Buffalo State as granitic gneiss. Though described as grayish red in color (see Table 1) it had some black irregular streaks on one face. Aaron Shugar of SUNY Buffalo State’s Art Conservation Department conducted an XRF analysis using a Bruker Artax 400. 20kV 1500uA, 1.5mm collimator with a Helium flush for 120 sec. on both a dark streak and the non-streaked surface. The streak is composed of black iron oxide, likely magnetite. Examination of the surface of the specimen under a microscope indicates that the black iron oxide crystals forming the irregular streaks are found throughout the rock, making it probable that the streaks are formed by compositional banding within the rock, rather than the application of pigment. Both the reddish and black colors are more vibrant when the specimen is wet. The specimen was recovered immediately inside a section of palisade in an area relatively free of debris. It is curated in the Anthropology Department at SUNY/Buffalo State.

Figure 6. Stone disks from the Simmons site (Erie). Top row, from left to right: 4434, 5022, 12542, 12329. Second row, from left to right: 12781, 5126, 5124.
Joshua Kwoka and William Engelbrecht identified a total of eight probable chunkey stones from the Simmons site in the collections of the Marian E. White Museum of Anthropology, State University of New York at Buffalo (Figure 6). The site was excavated under the direction of Marian White in the late 1950’s and early 1960’s. The Iroquoian village component at Simmons dates sometime between A.D. 1550 and 1635. Of seven specimens with provenience, four were found within the village but outside longhouses, two were found near the palisade, and one was found in a hearth inside a longhouse (Figure 7). Engelbrecht and Kwoka experimented with the specimens to document that they successfully rolled along a carpeted floor.

Figure 7. Simmons site (Erie).
Seneca

Martha Sempowski and William Engelbrecht identified a total of 29 possible chunkey stones from Seneca sites in collections on loan from the Rock Foundation and curated by the Rochester Museum & Science Center. One specimen from Adams is represented by two fragments that are not conjoined. Another specimen from the same site (23/94) exhibits an oval formed by small pecked depressions near one edge of the stone (see Figure 8). The sites from which probable chunkey stones were identified were: Richmond Mills, Cameron, Adams, Dutch Hollow, Factory Hollow, Fugle, Warren, Steele, Dann, and Beal, dating from the mid-sixteenth to the late seventeenth century.

Figure 8 Adams site. Specimen 23/94 with pecked oval. Seneca.

Cayuga

Kathleen Allen and William Engelbrecht examined a large number of whole and partial stone disks from the Carman and Parker Farm (sixteenth century village sites) and selected two specimens from Carman as most likely used in chunkey. Both rolled along a floor. They are curated in the Anthropology Department, University of Pittsburgh. (Fig.9.)
Mohawk
Wayne Lenig identified 18 possible chunkey stones from ten different Mohawk sites in the New York State Museum in Albany ranging in time from ca. A.D. 1500 A.D. (Otstungo) to ca. A.D. 1630 (Coleman – Van Duesen). Seventeen of the 18 specimens selected rolled between five and eight feet on a laboratory table covered with 4 mm thick polystyrene sheeting. The specimens were given a gentle push and Lenig reports that with a larger space and a greater push they would doubtless have rolled much farther. Even those that were slightly ovoid rolled well. Lenig was assisted in identifying the stone by Charles Merguerian, emeritus chair of the Hofstra Geology Department. Four specimens from the Martin site contained a coating of red pigment, possibly hematite, and one specimen from Martin bore a thin black stain (manganese?). A sixth specimen from the Danascara Flats West site contained black streaks on both faces and a thin wash of red pigment on one face (Figure 10.). All these specimens were originally collected by avocational
archaeologists from plowed fields on village sites and according to Lenig no provenience information exists beyond that of the site.

Susquehannock

The Susquehannock were speakers of an Iroquoian language located along the Susquehanna River. Morehead (1938) pictures a burial (Grave 22, Plate XVI) in Queen Esther’s Flats cemetery near Athens, Pennsylvania, with a discoidal-like stone placed beneath the knees of a skeleton. The excavation was from the American Indian Heye Foundation’s 1916 Susquehanna River Expedition.

Discoidal stones were found in graves in the Murray garden at Upper Queen Esther’s Flats, on the surface at Spanish Hill and Lower Queen Esther’s Flats and other Andaste sites. None are bi-concave, but all are unmistakable. Several examples are highly polished (Morehead 1938:62).
Cadzow (1936:191,193) pictures stone disks from the Schultz site that he believed were used as chunkey stones. There were a total of 13, ranging in diameter from 4 inches (10.2 cm) to 5½ inches (14 cm). The Schultz site dates to the late sixteenth century (Kent 1984). Jim Herbstritt examined six specimens from the Schultz site and a specimen from the Parker site (ca. A.D. 1475-1525), part of the North Branch tradition (Herbstritt 2018), all in the Pennsylvania State Museum in Harrisburg. Two stone disks from the Schultz site have markings. One has a shallow incised cross on one face (Figure 11). Another specimen from Schultz has cross-hatching on both faces (Figure 12). A third specimen from Schultz has small but well defined notches opposite one another on its edge. While the notches are suggestive of a net sinker, the circular shape would be unusual.

Figure 11. Shallow cross on small specimen from the Schultz site (Susquehannock). Scale is in centimeter.

Figure 12. Three views of Susquehannock specimen with cross-hatching.
Attribute Summary of Iroquoian Stone Disks

Age

The age of the Iroquoian sites discussed here range from the late fifteenth through the mid-seventeenth centuries. It is quite possible that there are both earlier and later specimens than the ones discussed here. Also, some of the sites with stone disks are multi-component precluding firm dating of all specimens to the Iroquoian component.

Dimensions

The mean diameter and mean thickness of the specimens in this study are given below.

<table>
<thead>
<tr>
<th></th>
<th>Mean Diameter</th>
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<tbody>
<tr>
<td></td>
<td>cm.</td>
<td>cm.</td>
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<tr>
<td>Neutral</td>
<td>8.3 (N=1)</td>
<td>4.5 (N=1)</td>
</tr>
<tr>
<td>Erie</td>
<td>7.5 (N=8)</td>
<td>3.7 (N=8)</td>
</tr>
<tr>
<td>Seneca</td>
<td>7.8 (N=24)</td>
<td>3.8 (N=23)</td>
</tr>
<tr>
<td>Cayuga</td>
<td>7.2 (N=2)</td>
<td>3.5 (N=2)</td>
</tr>
<tr>
<td>Mohawk</td>
<td>9.6 (N=18)</td>
<td>4.7 (N=15)</td>
</tr>
<tr>
<td>Susequehannock</td>
<td>5.5 (N=7)</td>
<td>1.1 (N=7)</td>
</tr>
</tbody>
</table>

The mean diameter of 60 specimens is 8.1 cm, while the mean thickness of 56 specimens is 3.7. If just specimens from New York are considered (excluding the Neutral specimen and the seven Susquehannock specimens), the mean diameter is 8.4 and the mean thickness is 4.1. The mean dimension for specimens from Susquehannock sites in Pennsylvania are much less. In particular, the mean of 1.1 cm for thickness of the seven Susquehannock specimens is significantly less. One specimen from the Susquehannock Schultz site had the smallest diameter (2.6 cm.) of any specimen in the sample and another specimen from Schultz was the most thin (.6 cm). A specimen from the
Dann site (Seneca) had the greatest diameter (11.5 cm) while one from Martin (Mohawk) had the greatest thickness (5.6 cm).

Shape

All the whole specimens in this study were symmetrical or nearly so. Four attribute states were recorded: biconcave, flat, biconvex, and asymmetrical. Generally, specimens recorded as biconcave or biconvex were not markedly so. Specimens described as asymmetric generally had one flat side and one side slightly concave or convex.

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<table>
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<tbody>
<tr>
<td>biconcave</td>
<td>7</td>
</tr>
<tr>
<td>biconvex</td>
<td>20</td>
</tr>
<tr>
<td>flat</td>
<td>11</td>
</tr>
<tr>
<td>asymmetrical</td>
<td>21</td>
</tr>
</tbody>
</table>

The edges of 62 of the 66 specimens were examined. Forty-two (68%) were rounded while 18 (29%) were flat or semi-flat (see Figure 12). The edges of two were irregular.

Lithic Material

The composition of 36 of the specimens was identified. Twelve of these were various forms of sandstone including hematic quartz sandstone (N = 5), and one specimen each of arkose sandstone and indurated sandstone. Ten specimens consisted of feldspatic gneiss (N = 5) and granitic gneiss (N = 2). Six specimens were composed of siltstone.

    Hardness (Mohs) is the resistance to scratching and wear, while toughness is the ability to withstand fracture. Sandstone, gneiss, and siltstone tend to be relatively harder and tougher compared with the other rock types in the sample: diabase, dolomite, greywacke, quartzite, schist, and shale.
Identification of individual specimens can be viewed in a table on tDAR, the Digital Archaeological Record.

https://core.tdar.org/document/440583/iroquoian-chunkey-data
Color

Munsell’s *Geological Rock-Color Chart* was used to assign colors to the specimens. It should be noted that except for the specimen from the Eaton site, all color assignments were done using photographs rather than the actual specimens, so shifts in color may have occurred. Six Mohawk specimens bore pigment on one or both surfaces, four having red pigment, one having black pigment, and one having red pigment on one face and black streaks on both.

The Munsell color for 64 specimens was determined (see the tDAR link on the prior page) and are given in descending frequency below.

- pale red (5R 6/2, N = 14) and (10R 6/2, N = 5) = 19
- pale red purple (5RP 6/2) = 11
- grayish red purple (5RP 4/2) = 8
- grayish orange pink (5YR 7/2) = 5
- pale pink (5RP 8/2) = 5
- grayish red (5R 4/2 = 2) and (10R 4/2= 1) = 3
- very light gray (N8) = 3
- moderate red (5R 5/4) = 3
- brownish gray (5YR 4/1) = 2

Finally, one specimen of each of the following colors was recorded: dusty red (5R 3/4), light brownish gray (5YR 6/1), pale brown (5YR 5/2), light olive gray (5Y 6/1), and yellowish gray (5Y 8/1). Of the 64 specimens all but seven had either red or pink in the name. Of these seven, six had gray in the name and one had brown.
Location

Some specimens lacked specific provenience within a site including all those from Mohawk sites and the Neutral site. Seneca specimens not from a burial also lacked specific provenience other than the village surface. The two specimens from the Carman site (Cayuga) were from the village. Six of the seven Susquehannock specimens came from pits while one was found by the palisade. A specimen from the Simmons site (Erie) was found in a pit by the palisade and a second from Simmons was found by the palisade, as was the specimen from Eaton. One specimen from Simmons was found in a longhouse hearth. See Figure 7 for a map of Simmons with the location of stone disks.

The only chunkey specimens from burials came from the Seneca area. The graves of three adult females each contained a chunkey stone, the grave of one adult male contained one, and the graves of 5 children contained chunkey stones. Four child graves from Dutch Hollow each contained one chunkey stone, while a child grave from Steele contained seven specimens (Figure 14). Two burials from the Warren site each contained a chunkey stone, but the age and sex of the individuals were not recorded. Thus, 17 of the 29 Seneca specimens or 59% were from mortuary contexts. All these burials were excavated by avocational archaeologists over a half century ago.
The chunkey stones from the three burials of adult females (Cameron 5271/41, Adams 168/94, and Adams 172/94) had a mean diameter of 9.5 cm. The male burial from Dann contained the greatest diameter in the entire Iroquoian sample (11.5 cm) (Figure 13). The average diameter of chunkey stones in adult burials was 10.0 cm. The average diameter of the 12 chunkey stones from non-mortuary contexts was 7.8 cm.

The seven chunkey stones from the child burial from Steele ranged in diameter from 4.6 cm to 6.2 cm in diameter (Figure 14). The diameter of these specimens was less than the mean diameter for the other Seneca specimens (8.0 cm), fitting...
for the use of a child. The association of large chunkey stones with adults and small specimens with children did not hold for the 4 other child burials, as specimens from these graves had a mean diameter of 7.3 cm. The seven chunkey stones in the Steele child burial is suggestive of both the seven Thunderers (in whose honor hoop and pole was played) and the number of stars in the Pleiades, seen by the Iroquois as representing departed children (Wonderley 2009:2-13).

In the twentieth century favorite gaming implements were sometimes buried with the Iroquois (Abrams 2017: xv; Shimony 1961:242-243; Venum 1994:45) so it should not be surprising to find chunkey stones in earlier Iroquois burials. What is surprising is that three of the burials were those of adult females. Hoop and pole and chunkey are described by Culin (1907:421) and others as male pursuits.
Alternative Functions

Contemporary archaeologists working on Iroquoian sites have not expected to find chunkey stones and we suspect that they have routinely overlooked this possibility. When possible chunkey stones are encountered they are classified as something else. Many of the stone disks described in this article have been interpreted as being hammerstones, anvil stones or pitted stones, abraders, mullers, or polishing stones (Figure 15). It is possible that some specimens we describe were used in this manner and not used as chunkey stones or were used both as chunkey stones and as tools during their use life. Arthur Parker recognized the problem of determining the function of stone disks when he stated nearly 100 years ago: “Hammerstones, mullers, and game disks grade into one another in such easy stages that it is sometimes difficult definitely to give a use name to a specimen” (Parker 1920:420). Of the 18 Mohawk specimens in the New York State Museum, 16 were given the following description: muller = 8, hammerstone = 5, pitted stone = 1, gaming stone = 1, and discoidal stone = 1. Two specimens were not categorized.

Arguing against the sole use of stone disks that roll as tools is that this is an unlikely shape for a stone tool. The function of a hammerstone, muller, etc. do not necessitate a symmetrical shape and it seems unlikely that their use as tools would create such a shape. While the specimen from Eaton is generally smooth, evidence of light battering along the edge and some on one face suggested to one researcher that it was a multi-purpose tool used as a hammerstone and anvil stone. While not denying this possibility, Engelbrecht judges that it is more likely that the
battering along the edge resulted from deliberately shaping the specimen so that it could roll. Finally, the inclusion of stone disks in Seneca burials favors the interpretation that they were spiritually charged objects used in a sacred game.

Discussion

Unlike modern sports, there was a lack of standardization of equipment used in traditional Native American sports (Oxendine 1988:15). This lack of standardization is reflected in the size range of the specimens described in this article. Finely crafted chunkey stones associated with Cahokia range from approximately 5 to 13 cm in diameter and are a relatively rare find (DeBoer 1993:83, 89; Zych 2015:71). Zych (2017:81-82) summarizes maximum diameter and thickness of chunkey stones from sites in the American Bottom, Mill Creek (W. Iowa), Monongahela (upper Ohio River Valley), and the western Great Lakes (Wisconsin). Adding New York Iroquoian sites to this we have the following.

<table>
<thead>
<tr>
<th>Area</th>
<th>Mean diameter</th>
<th>Mean thickness</th>
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<tbody>
<tr>
<td>American Bottom</td>
<td>6.4 cm (N = 109)</td>
<td>2.9 cm (N = 100)</td>
</tr>
<tr>
<td>Mill Creek</td>
<td>5.7 cm (N = 9)</td>
<td>2.8 cm (N = 100)</td>
</tr>
<tr>
<td>Monongahela</td>
<td>8.0 cm (N = 54)</td>
<td>3.1 cm (N = 51)</td>
</tr>
<tr>
<td>W. Great Lakes</td>
<td>7.6 cm (N = 54)</td>
<td>3.2 cm (N = 62)</td>
</tr>
<tr>
<td>NY Iroquoian</td>
<td>8.4 cm (N = 52)</td>
<td>4.1 cm (N = 48)</td>
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George (2001) separated what he felt were local Monongahela sandstone disks from imported Mississippian discoids on Late Monongahela sites. If what George considered local Monongahela chunkey stones are considered (N = 38) they have an average diameter of 6.9 cm and a thickness of 2.5 cm. On average, the New York Iroquoian specimens have a greater diameter and greater thickness than the specimens from other areas, though there is considerable overlap. The mean diameter
of 5.5 cm for the Susquehannock specimens is similar to the 5.7 mean diameter of the “door knob discoidals” (Baerreis 1968:187) from Mill Creek sites.

DeBoer (1993:89) calculated the average diameter of chunkey stones from midden contexts (approx. 4.5 cm) and from mortuary contexts (approx. 8 cm) for the period of time during Cahokia’s height and found a statistically significant difference. The mortuary sample for this time period was all from adult male burials (DeBoer 1993:88) and includes 14 chunkey stones from Mound 72. While the Seneca sample is less robust with only four chunkey stones from adult burials, the stone disks from adult burials are larger than those from non-mortuary contexts (10 cm versus 7.8 cm) showing a similar pattern to that of Cahokia. The large (11.5 cm) disk from the adult male burial at the Dann site is larger than the largest chunkey stone from Mound 72 (10 cm).

None of the specimens in this study replicated the classic biconcave (discoidal) shape of Cahokia style chunkey stones. Most of the Iroquoian specimens are either biconvex or slightly asymmetrical. Many of the biconvex specimens appear similar to the Bradley variant described by Perino (1971:114,116) in use in Arkansas and Illinois after A.D. 1350. DeBoer’s (1993:87-88) seriation of chunkey stone styles indicates the Bradley variety became popular in the post-Cahokia period and Perino (1971:116) states that this type was used into early Historic times. Specimens with rounded edges likely curved to the left or right toward the end of their roll introducing additional uncertainty to their final resting place. The lack of recognition of chunkey stones on Iroquoian sites may be due in part to the fact that the shape of Iroquoian stone disks differs from the more familiar discoidal shape characteristic of Cahokia-style chunkey stones.

George (2001:1) observes that biconcave discoidals are always made of hard stone and this appears to be true of Iroquois stone disks. Locally made Monongahela biconcave discoidals
were all made of sandstone while what he believed to be imported Mississippian discoidals were also of hard rock, mostly sandstone (George 2001). Zych (2017:74-78) lists the composition of 79 specimens from the western Great Lakes and American Bottom. The most frequent material used was basalt (N=19), followed by sandstone (N=13), granite (N=12) and quartzite (N=10).

In discussing the hoop and pole game across North America, Culin (1907:420-527) frequently notes that the hoop was colored. The most frequent color mentioned is red, but hoops were also colored blue and black and colored beads were sometimes affixed to the hoop. Culin (1907:433) equates the Oglala Dakota’s wooden “conjurer’s hoop” with the hoop used in hoop and pole. The conjurer’s hoop represented the ecliptic and was painted four colors: yellow for the eastern horizon to the sun’s zenith, red from the zenith to the western horizon, blue for the first half of night and black for the second half (Culin 1907:433-434). The color symbolism associated with hoops suggests that there might also be color symbolism associated with chunkey stones.

Gray or white stone disks may have represented the moon. Association of chunkey stones with the sun may have encouraged selection within the red – orange – yellow spectrum. Culin (1907:510-511) notes a biconcave disk of quartzite from North Carolina that is stained yellow. The Winslow site along the Potomac River is remarkable for having 115 chunkey stones in various stages of manufacture (Marshall 1992:170; Slattery and Woodward 1992:60). A Triassic red sandstone that outcrops about a mile away from the site was used as the raw material. Red flintclay was selected for a number of stone sculptures from Cahokia including the famous pipe of the Chunkey Player (Pauketat 2009a:49). Vennum (1994:215) notes in his book on lacrosse that players and equipment were often painted red. For Native Americans red was associated with a variety of attributes including success and winning. The reddish/pinkish hues of the
overwhelming majority of specimens in this study likely reflects this symbolism.

Colored beads or marks on hoops were sometimes used in scoring (Culin 1907:420-527) and it is possible that bands on chunkey stones were as well. Pauketat (2009a:45-46) notes that some Cahokia style chunkey stones are red banded. While XRF analysis indicates the irregular black streaks on one face of the Eaton specimen are not added pigment but rather part of the rock fabric, it is possible that the presence of these streaks on one face was a factor in selecting this material. It is also possible that the notches on the specimen from the Schultz site could have functioned like the colored beads or marks on hoops for scoring.

While engraved chunkey stones are relatively rare, especially at Cahokia, those that are engraved have images that may be equated with the “upper world,” including crosses indicating the four directions and sun circles (Yancey and Koldehoff 2010). The shallow cross on the Susquehannock Schultz site specimen appears to fall into this category (Figure 11). The pecked oval on the Seneca Adams site specimen (Figure 8) resembles but is not identical to the ellipsoid or diamond shaped “ogee,” a Mississippian motif possibly representing the sun or a falcon (upper world) or a diamond back rattlesnake (lower world) (Yancey and Koldehoff 2010:497). Jim Herbstritt notes that the cross-hatched lines on the Schultz site specimen (Susquehannock, Figure 12) resemble Anishinaabe depictions of the Grand Medicine Lodge of the Midewiwin (Hoffman 1888).

Between A.D. 850 and 1150 chunkey stones are associated with male burials in the greater Cahokia area including the 14 finely made discoidals included with other offerings in Mound 72 at Cahokia (DeBoer 1993:87-88; Fowler et al. 1999). Before and after this period, chunkey stones sometimes occur in child burials. In Seneca mortuary contexts, chunkey stones most commonly occur in child graves, though three adult females and one adult male burial contain a chunkey
stone. Early literature refers to chunkey stones in Susquehannock graves. However, outside the Seneca and Susquehannock regions, Iroquoian specimens of known provenience occur in the village area or in pits. This appears similar to their distribution in other areas where chunkey stones more commonly occur in middens than graves (DeBoer 1993:88).

At Cahokia and other Mississippian centers chunkey was played in specially prepared plazas or courts. In the Southeast: “Playing surfaces were leveled, smoothed, covered with fine sand, and swept daily” (Zych 2015:71). The chunkey stones were carefully curated and used over generations (Adair 1775:402). In Mississippian sites, chunkey stones are often found near open plazas or public buildings (Zych 2015:72). Culin (1907:463) noted that the Pawnee played hoop and pole on a smooth, beaten path and this may have been true of Iroquois chunkey. It is not known if chunkey was played within or outside Iroquois villages, but the recovery of these disks within villages suggests the former. One could speculate that chunkey stones were rolled along an area parallel to and inside the palisade. Spectators could have found vantage points on the palisade or even on houses. In 1661 a Jesuit entering an Onondaga village stated that there were people in trees, on houses, and on the palisade watching him (Thwaites 1896-1901, 47:75).

Chunkey, Hoop and Pole, and Lacrosse

The incidence of Iroquois stonework declines during the seventeenth century, so it is not surprising that no stone disks have been identified from eighteenth century Iroquoian sites. Historically, lacrosse plays a more prominent role than hoop and pole among the Iroquois. In the Southeast chunkey was played in early historic times but is supplanted by lacrosse. Why did hoop and pole/chunkey become less prominent?

Unlike the egalitarian Iroquoians, Mississipians lived in a ranked society. It was the elite who had the plazas constructed in which chunkey was played. DeBoer (1993) has suggested that
the game was regulated by the elite who wished to profit from the associated gambling. Both DeBoer (1993:90) and Paukett (2009b:23) note the likelihood that the power of Cahokia’s elite was related to the control of chunkey and its religious symbolism. If a chunkey stone represented the cosmos, then the game became a means whereby the elite associated themselves with divine powers. Scheduling and control of chunkey by the elite would have served to validate their role in maintaining the world order. Brown (2007:85,89) compared images of the “Birdman” design on Mississippian shell gorgets in which the central figure held either a severed head or a chunkey stone, suggesting that losers of chunkey games in Mississippian centers were sometimes decapitated. In the post-Mississippian world, the symbolic association of chunkey stones with the cosmos was likely remembered, though the role of chunkey in supporting the hierarchical social order was gone.

As Mississippian centers declined, scattered Iroquoian populations to the Northeast were beginning to coalesce. After the fourteenth century a typical Iroquois village could have fielded one or more sports teams, something that was not possible when Iroquoian population was more dispersed. Both chunkey/hoop and pole and lacrosse could be played as team sports and so these games could have been played between village moieties, communities, or between Iroquois nations. Team sports promote group solidarity and cohesion and so both chunkey and lacrosse could have played a role in consolidating newly formed Iroquoian polities, just as earlier chunkey probably fostered the development and cohesion of Mississippian centers.

Both chunkey/hoop and pole and lacrosse call for skill, stamina, and strength. However, lacrosse also called for speed and teamwork similar to that needed in warfare. Lacrosse, sometimes known as “The Little Brother of War,” offers a closer parallel to war than chunkey. Successful warriors gained prestige in Iroquoian society. As warfare declined between eastern Native
Nations after the American Revolution, lacrosse provided males with an alternative pathway to validate their manhood and enhance their status (Fogelson 1962:232-233). As a contact sport, lacrosse afforded spectators greater excitement, just as in modern society football and soccer draw bigger crowds than bowling or curling.

Fenton’s (1936) account of Iroquois hoop and pole in the 1930’s ties its performance to the Iroquois ritual cycle among followers of the Longhouse religion. Fenton suggests that winning or losing was less important than the fact that hoop and pole was performed for a reason, such as bringing rain or curing the sick. In Witze (2013:18) Pauketat suggests that playing chunkey was associated with a particular world view. If the playing of hoop and pole and chunkey were closely linked to indigenous ideology, then the spread of Christianity would have discouraged its practice. It is perhaps significant that hoop and pole continued to be played at Allegheny where there were followers of the native belief system.

Summary

Chunkey was played in many Native American cultures and the authors argue that Iroquoians played chunkey as well. Consequently, we argue that the geographical distribution of the game is greater than was previously realized. In the past, discussions of Iroquoian development have been dominated by a choice of two models, migration versus in situ development (Engelbrecht 2003:111-112). More recently, a model of ethnogenensis has gained popularity (Engelbrecht 2003:112-114) in which Iroquoian development is seen as taking place within a wide network of social and political interaction, incorporating people, ideas and material culture from adjacent regions. The spread of chunkey to Iroquoia best fits this latter model.

Iroquoian stone disks differ in shape from the discoidal stones found at Cahokia and related Mississippian sites in that they are generally biconvex or slightly asymmetrical rather than
biconcave. They are similar to the later Bradley variety described for the Midwest. The average of Iroquoian specimens have a mean diameter of 8.4 cm, a mean thickness of 4.1 cm, have rounded edges, are shades of pale red or pale pink in color, and tend to be of both hard and tough stone like sandstone or gneiss. They can be easily rolled, having both the requisite shape and balance.

More stone disks that could have been used in this game remain to be identified from Iroquoian and pre-Iroquoian sites. Archaeologists need to re-evaluate ground stone collections for the existence of stone disks that can be rolled. Such stones may have been identified as mullers, pitted stones or nutting stones, anvil stones, hammerstones, or simply natural objects. Use of a specimen as a ground stone tool at some point in its use life does not preclude its use as a chunkey stone. Further investigation of color symbolism associated with chunkey stones also needs to be undertaken.

Pauketat and others have suggested that the game of chunkey was a critical component in the rise of Cahokia and the spread of its influence. Since it was not thought that Iroquoians played chunkey, there has been no consideration of its possible role in Iroquoian development. We suggest it promoted group identification and solidarity during the process of settlement coalescence in contests against teams from other villages or groups. Additional functions associated with inter-community games could have involved mediating relationships as well as redistributing goods through gambling. Such games would also have brought individuals from different groups together to exchange information (Weiner 2018) and possibly find mates. These activities are commonly associated with Native American games, but it is not known if any or all of these were associated with Iroquoian chunkey. What is probable is that Iroquoians used chunkey for their own needs which were different from those of the Mississippian elite. However, some of the associated Mississippian symbolism appears to have persisted such as the
association of chunkey stones with the sun. Chunkey in Iroquoia may be seen as a distant echo of the big bang that was Cahokia half a millennium earlier.

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