



POLYHEDRON AND CULTURAL VALUE IN THE KALINGA HEIRLOOM BEADS (BONGEY)

Lalin Abbacan-Tuguic, Instructor I, Kalinga State University

Abstract: *Kalinga Heirloom Beads (bongey) are intriguing cultural items of beauty and memory while Kalinga bead weaving is a phenomenally rich medium for creating mathematical art in three dimensions (polyhedron); thus, this paper was primarily conceived to provide better understanding of the characteristics of Kalinga heirloom beads as to its geometrical shape and size employing the descriptive ethnographic approach. The common beads identified are the Adchongan, Carnelian Beads, Paraggi or Chumat, Jar Beads or Buyod, Pilampalay, and Impit. Moreover, the results underscore that Kalinga beads possess different colors in one bead formation though some are simple and plain. The shapes of the beads possess a tri-dimensional figures either polyhedron or non-polyhedron such as round, cylindrical, spherical, and rectangular.*

Keywords: *bongey, beads, polyhedron, value, adchongan, ornament*

INTRODUCTION

The complexity and diversity of the nation depict its own uniqueness and harmonious nature. Its identity is being mirrored through the culture of its certain area, the interaction of the people, traditions, laws, customs, industries, commerce and religion, it is characterized by the presence of various ethnic institutions even as the people share many elements of a common heritage make unity and national development a complex issue (Cayangao, 2013).

One of the common heritage of the Cordillera is the bead (bongey). These are intriguing cultural items of beauty. In the very ancient traditions, the earliest materials used for beads were found in nature like seeds, berries pieces of wood, shells, stones, bones, tusks or modern materials like glass and plastics, formed, polished and pierced to be strung and used as bodily adornments or as decoration for other objects. Glass beads are made then by melting and shaping silica. Bead makers also use silica to imitate stone beads. Wherever they are being made or manufacture, they are still treasured as valuable objects of material culture and play a significant role in some of the most important aspects of our personal and communal life from the proverbial cradle to the grave.



Historians believe that beads travelled to the Philippines by introduction of traders from India, China, Indo-China, Malaysia and some Arab countries. They were traded back then with other commodities such as metals, porcelains, silk and other cloths, teakwood and the like. However, the flooding of the world market from beads had even started way back in the early 15th century.

In most part of Cordillera, beads are held precious and sacred especially for women. They inherit it from their mothers who in turn inherited it from their mothers and grandmothers before them. It connotes in some ways the grandeur and the wealth of the family because these are valuable ornaments.

Kalinga, as one of the highland culture of the Cordillera is commonly known as the peacock of the north due to its rich tradition and culture, one is the possession of heirloom beads (bongey).

From this fact alone, we could say that beads through the eons have become an essential art and durable possessions of humans. The intimate relationship of beads and humans is reflected in the fact that no matter the culture, the time or condition or situation, beads have always been part of those artefacts being unearthed from ancient graves or lost civilizations as may be. And most certainly, in most cultures where “tribes” are an important cluster of identification, beads are often worn as an art and carried by its owner from birth to death, and are often buried with the person too when he dies.

The link between mathematics and art goes back thousands of years ago (American Mathematical Society, 2016). Mathematics has been used in the design of bead making. According to Fisher and Mellor (2007), bead weaving is a phenomenally rich medium for creating mathematical art in three dimensions; indeed, many beaded beads can be viewed as polyhedral and non-polyhedra, where the hole through the middle of each bead corresponds to a polyhedron's edge. A polyhedron is a solid figure consisting of four or more plane faces, pairs of which meet along an edge, three or more edges meeting at a vertex. In a regular polyhedron all the faces are identical regular polygons making equal angles with each other. Specific polyhedrons are named according to the number of faces, such as tetrahedron while a regular polyhedron is a polyhedron whose are all congruent regular polygon. The regular tetrahedron (pyramid), hexahedron (cube), octahedron, dodecahedron, and icosahedrons are the five regular polyhedrons.



Different weaving patterns bring different numbers of these "edges" together to form the vertices of a polyhedron, Fisher says. The holes of beads, for example, can be strung together to form the edges, vertices, and six faces of a cubic bead cluster. In other words, given any polyhedron, it's possible to weave a beaded bead with the same set of symmetries. Such polyhedral beaded beads also have particular symmetries, classified by the three-dimensional finite point groups. He also described weaving techniques that allow the realization of beaded beads with all the possible symmetries of polyhedra. There are several ways to build a polyhedron with beads. One technique that will always work is to align the hole of a bead along each edge of the polyhedron. Then, the thread connects the beads at the vertices of the polyhedron. The most stable polyhedron is the tetrahedron because it is made of all triangles.

Thus, vital to the conservation of the traditional Kalinga beads is the understanding of its intrinsic mathematical art and value. This way, we come to be grateful for our past, improve our present lives, and outline the framework of our future, It hopes to contribute in imparting substantial knowledge and enriching our understanding of Kalinga heritage thereby encouraging the cultivation of a strong local and national pride.

CONCEPTUAL FRAMEWORK

The word bead comes from the word "bidden", an Anglo-Saxon word meaning "to pray" or the word "bede" which also means "prayer" as stated by Flyingpig (2006). Beads were probably one of the earliest ornaments or accessories that humans ever possessed.

The heirloom bead of each family may be different and there are no special rules or laws governing them. They are kept not only out of sentimentality but because of their vital functions within the group. They are part of the Kalinga native social fabric/attire and intimately woven into the lives of the people, they have such beads they call "*farinot*" and "*ong-ong*". In Sadanga, they call their heirloom beads "*finlash*" (D.A, 2009). But whatever each tribe call their beads one thing is true and common. Since the appearance of beads some 40,000 years ago, these tiny morsels have evolved and traveled great distances and histories. In each case, per culture, each one has developed its own unique style and design and the techniques by which they were made vary too. Through trade they spread their values depending on the uniqueness, beauty, history and their use.



Kalinga beads when strung together portray a different aesthetic effect; for, a string of beads is, in itself, also artwork. For those who know how to string beads, stringing beads is practiced as an art form that one can learn. It requires years of practice to develop the compositional skills and aesthetic appreciation to configure beads not only to be beautiful in design and presentation, but also beautiful in evocation of ideas and sentiments. Well assembled string of bead is a piece of visual poetry. It is a statement constructed with mathematical concepts, color cadences, rhythm and rhyme to make aesthetic sense and evoke fine aesthetic sentiments in us. It is this that gives meaning to the traditional saying that when a string of beads breaks in front of the elders none gets lost.

RESEARCH OBJECTIVES

This study primarily aims to identify and describes the characteristics of Kalinga heirloom beads (*bongey*).

Specifically, it seeks answer to as to the:

- a. geometrical shape (polyhedron and non-polyhedron), color and size of Kalinga heirloom beads; and,
- b. Its uses and traditional value.

METHODOLOGY

The locale of the study is in the Municipality of Lubuagan, Kalinga. It made use of qualitative research. It employs primary data gathering through interviews using unstructured list questions and focus on group discussion among indigenous knowledge holders. Moreover, it also made use of ethnographic techniques and methods to study and analyze gathered information such as observation, non-participant observation, field notes keeping and literature review.

RESULTS AND DISCUSSION

Characteristics of Kalinga Heirloom Beads (Bongey) as to:

- A. *Geometrical size*
- B. *Color*
- C. *Size*
- D. *Uses and traditional value*

Adchongan

The eminent and notably priced bead with such massive amount in Kalinga is known as the *adjongan* (universal name). It is dark on one half, and white on the other, with a small layer



of brown referred to as "lipstick" at the tip of the white end. The size of the adjongan ranges from 5cm to 5mm. "Small adjongans are referred to as *impit*, or *pilat* in Lubuagan while the finest adjongans are referred to as *masilap*, average is the *abali* and the least fine is *kinawayan*" (Pocais, 2012). The best adjongan are agates with distinctive color contrasts. One type of glass adjongan even has the lipstick, but the color is dull.

The finest big adjongan (per bead) is worth a big carabao, while the least expensive glass imitation is only worth a large hen. Two medium sized adjongans are worth a carabao while it takes five *impit*.

Two small adjongans are given by the groom's parents to the bride's parents, and returned if legal separation or annulment happens. Adjongan beads symbolize wealth, and are a prerequisite for the *kachangyan* (rich) class thus said that it is much cherished by the IKalingas.

Carnelian Beads

A quartz bead which is popular in Kalinga is the carnelian. Carnelian beads are from South Asia which exist in several shapes, washed with bold maroon.

The Tilaga-an is the most common Kalinga beads and it is popular with older women who sometimes include adjongan with them. It is hexagonal cylindrical and is traditionally worth that of a large sow.

A carnelian bead named Lumyang meanwhile is hexagonal diamond and is given by the grandparents to the eldest son. It is often worn together with adjongan beads. The lumiyang are traditionally worth the equivalent of a large sow while Piniyapiyasis hexagonal barrel and is worth a small pig.

"The ayuvo is used to promote good health and growth for children, and is routinely tied onto the wrist of the newborn by the female shaman (*mandadawak*) in a ritual called *sipat ni anak* to drive away the malevolent spirits (*kakkarading*), and rendering the infant *nasipatan*" (Pocais,2012). The ayuvo is oblong and is equivalent to a large hen while Namut is worth 2 - 3 roosters which comes in octagonal cylindrical shape.

Paraggi/Chumat

The prominent Chumat is a Venician chevron bead. However, the majority of chevron beads in Kalinga are of recent manufacture, and are said to have been brought by a renowned anthropologist who distributed them freely among the IKalingas in an attempt to



obtain popularity. The Chumat is either small or medium in size and cylindrical opaque blue with red and white waves at the end. The largest size used by the IKalingas has an equivalent value of a small pig while the smallest size has a traditional value of a hen.

Agate/Jar Beads/Buyod

The *Buyodor* "Jar" beads are unique and rare which are usually worn as pendants on necklaces. They are shaped like little jars, hence the name. Sung, Ming and Ching porcelain jars, as well as Annamese and other earthenware jars are considered heirlooms in Kalinga thus adding significance to the jar beads. A fairly large and frequent agate is the *burod*. This is very distinctive and elegant with its whitish band around the middle. They are sometimes found in pairs on twin stranded bead arrangements in the same manner with their traditional value equivalent that of a large boar (*gangao*). Various big agates are exceptional but are well known in Kalinga, and are commonly used as center piece for necklaces. A few examples of long strands of agates with several big beads have been documented but these cannot be considered typical.

Pilampalay

Barrel shaped glass beads in several color variations with angled ends are used extensively. These beads are probably of Chinese origin and are known as "Ming" beads in the lowlands because of the resemblance to Ming dynasty ceramics. Most are white with blue design; however, some have red portions instead of blue, and a few are black with white motif. Ming beads have escalated in value due to external demands. This begun with Imelda Marcos who acquired every Ming beads in the market in her days. Thus, the traditional value of a Ming bead from that of a small pig reached a heightened change towards its value.

CONCLUSIONS

1. The Kalinga beads possess different colors in one bead formation but some are simple and plain. The shapes of the beads possess a tri-dimensional figures either polyhedron or non-polyhedron such as round, cylindrical, spherical, and rectangular and mostly patterned from the form of fruits.
2. Beads serve to facilitate growth and good health but they mainly serve as personal adornment and culturally suggests ethnic identity and social status.



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