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AUTHOR Matejovsky-Nikoltsos, Catherine
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ABSTRACT

This paper first gives a historical overview of mosaics, discussing mosaic masks made by the Aztecs and floor mosaics made by the Greeks, as well as the Roman mosaics at Pompeii and the Byzantine decorative mosaics exemplified by those at Ravenna. The paper then elaborates on children's mosaic making observed during research conducted between 1986 and 1992. Research was done both in small groups of 3 or 4 children in natural seaside settings and in class groups of 18 to 22 children in Greek kindergartens. The paper concludes that the children's work with mosaics, which demonstrated the use of images, symbols, and design, parallels the development of the art of mosaics over its history. (Contains a 38 references.) (BT)

Art with Stones: From the Cave Age until Today with Parallels Seen in the Artistic, Symbolic and Creative Development of Young Children's Mosaic Making.

Matejovsky-Nikoltsos, Catherine

Dr. Catherine Matejovsky-Nikoltsos

ART WITH STONES:

From the cave age until today with parallels seen in the artistic, symbolic and creative development of young children's mosaic making.

Introduction

One could say that the first mosaics were made by nature. It is in nature that we find "mosaics" of beautifully colored pebbles, stones, and shells, along the seaside or the riverbanks. The designs of nature, however, are of chance and not made through organized planning or thought of composition. It is man who takes the materials of nature, such as stones and pebbles, and creates art; the art of mosaics.

In the cave age, and throughout the prehistoric period, art grew out of necessity. Chopping away to create tools and weapons out of stone, the cave man accumulated chips and pieces of big rock. Other prehistoric ancestors may have found slabs of marble, limestone in the mountains or pebbles along the sea coasts or along the trails near their caves. Because of moisture, mud, sand and dust, early man realized that if he placed a slap of stone at the entrance of his home-hut-cave,or if he collected pebbles and spread them across the mud, he would have a stable surface under his feet, and would have less mud or dust within his habitat (Hoffman and LeBrun,1994).

The modern-day "cave man" of the campsites uses this exact method in front of tents to drain off moisture and mud in case there is a rain storm, and also,when the weather is sunny and dry, to clean off sand and dust before entering the tent. It was for a practical, functional necessity that man began to make mosaics. But man, even the man of the prehistoric age, did not settle for just the simple functional aspect of the material. With his creative spirit, he made some embellishment, added some decoration to his work. Thus, even young children at a campsite will collect stones and pebbles and begin to add a decorative touch around the tents,etc.

Stones and pebbles and gravel are ordinary materials. often overlooked for their artistic or aesthetic value; but when the material is highlighted in a Japanese garden or in an exhibit, or even in an artistic "environment", stones can reach the height of Fine Art. Nelson Goodman describes such an idea:

"...a stone lying in a driveway is not a work of art, nor is it a symbol of any kind. The same stone in a geological museum is also not a work of art, but because it is a sample of some of the properties of stones of a given period, it functions as a symbol. Put this same stone in an art museum, and it may begin to function as a work of art."
"The stone in the art museum exemplifies a certain shape, color and texture. It may even metaphorically exemplify a 'mood' . It functions as an aesthetic symbol."

(in Winner,1982,p.6).

Historical Development of Mosaics

Some of the first "mosaics" such as the mask or the snake of the Aztecs, were made to decorate liturgical items. They were small in size and precious stones such as turquoise,lapis lazuli,etc. were used(Lommel,1966,p.115) . We know from early Mesopotamian times that large columns of great hallways were decorated in a mosaic manner using small ceramic colored cones set into a sticky black tar-like material (Lloyd,1965,p.46). But the earliest mosaics of monumental size, using the natural materials of stones and pebbles are the mosaics that have been found in the Mediteranean area, especially in Greece.

Traces of pebble flooring, or crushed shell flooring have been found at the Bronze Age site of Akrotiri on the island of Santorini (Doumas,1983,p.52) and in the remains of a Neolithic house at Knossos (Evans,1964; Hood,1971). These various floor coverings dating back to the Minoan period (1600 B.C.) might not necessarily be considered "mosaics" by art historians. Man was still using the materials of pebbles or shells without any artistic or aesthetic design. He was "manipulating" or experimenting with these materials out of necessity, trying to understand their physical characteristics and creative possiblities.

A section of a floor covered with white pebbles, having some sort of a "woven" pattern was uncovered at the excavation at Tiryns, near Nauplion, dated to the 14th c. B.C., Myceneanean times (Podzuweit and Salzmann, 1984). It is the earliest example of a floor mosaic known, and it is interesting to see how man substituted a woven rug with a more durable material of small stones. We know that the Ancient mosaicists often considered themselves "weavers" or "embroiderers" from several of the mosaics that have been signed in the Greco-Roman and Early Christian periods (Asimakopoulos-Atzaka,1987, p.28).It also attests to another characteristic of mosaics: that of durability. The materials used and the mortar base that was developed over the centuries allowed the art and decoration of mosaics to survive for centuries.

An early floor mosaic that has been uncovered in Asia Minor at the ancient Phrygian site of Gordion dates to about 800-700 B.C.(Young,1968). There are many attempts at circular and geometrical symbols and patterns but the overall composition is scattered and shows no compositional plan. It appears as though the pebble patterns were copied from a pre-existing woven rug, and as the rug deteriorated, pebble designs replaced it for durability.This same phenomenon is seen some three hundred years later in a floor mosaic, also made of small white pebbles, that was found in Northern Greece at the site of Olynthos, dating to the 4th c.B.C. (Robinson,1933,Vol.V). In the early examples of mosaics that we have at Gordion and at Olynthos, we see the simple circle, spiral, cross, star-burst or "mandala" symbols that are basic liturgical and expressive symbols of man (Jung,1964). We shall encounter these same basic symbols when we examine the early mosaic designs of young children.

At the 4th c.B.C. site of Olynthos as well as other sites throughout Greece, such as at Eretria, we see that the floor mosaics made of only light and dark pebbles develop into images and figures that express mythology and heroic events. But it is during the Hellenistic period, during the Age of Alexander the Great at Pella, and at Vergina, that we see the height of artistic and technical quality in pebble mosaics (Andronikos,1975). The mosaic artists at Pella were able to use a larger array of natural colored pebbles and stones to create subtle tones and shading and in turn to develop the simple dark-light silouette images of the past into the finest "painted" images of the Hellenistic period. It became the fashion to have the floor of the symposium room and/ or the courtyard of one´s villa decorated with artistic designs made of stones.The mosaics of Pella raised the "craft" of mosaic making to a Fine Art. Making mosaics with sea pebbles for courtyard and floor decorations is a tradition that is still carried out on many Greek islands today.

When the Hellenistic period ended, and the Roman Empire began to expand itself to include Greece and Asia minor, the demand for interior and courtyard moasics became even stronger. Now the mosaicists had other patrons and even richer commissions. But to develop even finer images, with more details and subtleties of a painting, the craftsman cut the pebbles and stones into small cubes. Marble, limestone and even onyx and more precious stones were used to enhance the color range and beauty of the mosaic "paintings". The cubed stones and marble peices became known as "lessera", that is " four-sided" (Hetherington,1967).

The second century B.C. witnessed a fully developed "opus tessellatum" technique, using cubed "tesserae" and creating floor mosaics as rich and luxurious as fine oriental carpets.The Greek island of Delos was illuminated by some of the greatest examples of these mosaics (Webster,1966,p.149-157). Besides the many natural colors of stones and marble, faience and colored glass was also incorporated. Inevitably, with the increasing desire of the Romans to emulate the luxurious life of the Hellenistic princes, and their exposure to the exotic influence of the East, there were innumrable commissions for mosaic creations.

In the Roman mosaics at Pompeii,from the 1st c. B.C. to the 1st c. A.D,, such as the well-known Alexander-Darius battle scene, we see a development of a new mosaic technique for construction. It is the indirect, or "emblemata" technique that was used (Chrysopoulos,1982, p.79), allowing the artist to construct detailed images in the mosaic workshop and then transport them to the site. This indirect method of mosiac making is often done today and it is an easy technique for grade school children. But because the image is made in reverse, and because the tesserae are then smooth on the surface, the mosaics are not as "sparkly" nor as "tactile" as in the traditional direct-method.

Roman baths, with their alcoves and fountains, had mosaic decoration made up not only of natural colored tessarae, but beautiful colored glass was produced and used to highlight areas. Glass tesserae could not be used too extensively on floors because is was not durable enough, but as wall surface decoration, it withstood the moisture and dampness in the baths, and added a highly exotic and "tesselating" effect.

Then an event happened that would allow the art of stones: mosaics, to blossom and flourish: Christianity, 330 A.D. When the Holy Roman Empire took up residence in Byzantium,that is to say Constantinople, a whole new era began for the art of mosaics. Used as decoration for walls, arches, squinches pendentives, surfaces of the interior of the church's architectural whole, mosaics took on another meaning. The art of "tesselation", of tilting each and every tessarae to catch light and reflect and refract it throughout the monument, was the main attribute of mosaics.

Placing gold or silver leaf on top of the small glass cubes, the artist made the Byzantine mosaics shimmer. Amongst the blue or royal purple of a robe, there would glitter a red or a pale green tesserae. Portraits came alive with colors of green shadows,milky whites,dashes of pinks and ochre yellows. This chromatic separation, not too unlike the theory of color in Impressionist painting, beame a symphony of color! " The changing color

schemes were conceived in terms of rhythm," states Gervase Mathew, "and in some fashion the mosaics were apprehened as music,and color combinations were musical harmony."(Mathew,1963,p.5).

A famous Byzantinologist,Andre Grabar, has tried to describe the visual effect and the well thought out, planned arrangement by the mosaicists:

> "...the pitch of a cube in relation to the wall surface, color next to color, pattern next to pattern in the folds of drapery...all contribute to an effect aesthetically different from painting... each cube: colored, opaque, translucent, catches and reflects light...active ingredients of light."(Grabar,1964,p.6).

Unfortunately, space does not allow for a detailed survey of the master-pieces of mosaics in the Byzantine Era. Those found in Ravena,Italy, in Constantinople and in the northern city of Greece,Thessaloniki, attest to the beauty and the Fine Art of the craft of mosaic making (Chatzidakis,1994). In this report,emphasis has been placed on the man's first attempts to create art from pebbles and stones, his first attempts with natural materials to create mosaic designs of lasting importance, because the young child's first attempts to make designs and patterns in mosaics are very similar.

It should be noted that the mosaics that were made by young children follow as close as possible to the traditional materials and techniques of historical mosaics. We do not consider the use of plastic buttons, tacks, rice, macaroni,beans,etc., as proper materials for such an art. Pebbles,small stones and shells are used and they are placed in the traditional way, directly, into a liquid mortar, such as white cement. We know that man first placed pebbles and stones in the wet sand or earth, developed a mixture of sand, crumbled ceramic dust and lime to make a mortar.Then, adding marble dust or even the fine ash of Santorini, arrived at a very durable and pliable mortar base,cement (Haswell,1973,pp.53-62). This progression of natural materials, with natural materials for the tessarae, contributes to the young child's progression of creative and artistic expression when making mosaics.

Development of Young Children's Mosaics

Many of the following observations are based on research that was conducted during a six-year period (1986-1992) at the Department of Early Childhood Education of Aristotle University of Thessaloniki,Greece.

Children range in age from 3 years to 6 years of age and the art activities of mosaic making were done both in small groups of three or four children in natural sea-side settings, as well as class groups of 18 to 22 children in Greek kindergartens (Matejovsky-Nikoltsos,1992). Other research is continuing, and the work of preschool children and older children is being recorded. The parallels in construction, design, artistic and creative development of the children's work with the historic development of mosaics over the centuries is emphasized in this report.

Just as early man "played" with the materials of nature, pebbles and sea shells in the sand, so too do very young children enjoy making their first "mosaics" in the sand. Other materials that are "found" for young children's mosaics are pieces of marble and gravel stones in the school yards or at the construction sites. Even the humblest handfuls of gravel stones are painted to imitate the rich tesserae of Byzantine mosaics.Gold spray,used with caution and not in the presence of young children,make golden nuggets out of gravel stones. A variety of containers, small in size at the outset, were used to hold the mortar base, and allow the children space to experiment with the unusual materials.

From an adult point of view, the children's first attempts appear to be helter-skelter, a "scribble" of stones similar to their drawing scribbles of action and motion (Kellogg,1969,and Gardner,1980,p.45). It seems that the young children have simply taken a handful of stones and tossed them into the cement mortar base. Many have even sunk into the cement. In fact, the young child of three and four years has very carefully placed each and every piece. He or she has also spent a great deal of time handling the stone, turning it around and examining its every facet. The placement of the stone, in the very first mosiacs, seem to have no set composition, this is because the child is more interested in the material aspects: the weight,the color and the texture.Like scientists, they are experimenting with the effects of the stones into the liquid cement and they are trying to understand the physical phenomenon that they are "playing" with (Piaget,1973, Bruner,1985).This parallels the early caveman's wonder and curiosity in using materials and experimenting with them out of necessity.

Within a classroom or a group of 10 to 20 children, there were often one or two of the older children, age 5.5 to 6 years, who in their second mosaic design had already begun to make a "picture" such as a face or a sun,etc.Here it is important to note that the adult should not persist in "seeing" an image or a symbol in the young child's mosaic, if the child had no intention of making it (Winner,1982,p.8-9). Most often,even within the second week of mosaic

work, the majority of the class continued to experiment only with the physical aspects of the materials.Time was allowed so that this first phase of mosaic making was ample for the young children to discover the potential of the materials that they are using (Getzels and Czikszentmihali,1970). Unlike drawing,the children were not using so much "line" and "motion",instead, they were concentrating on "mass" and "space"(Piaget,1983). Once the child was confident with the materials and the space that he or she was working with, then the small mosaics began to take on an "image" or symbol.

A series of colored stones, sorted on top of the table, encouraged arrangement in the cement mortar and some children decided to make a "rainbow" or the "sun and sea". Through sorting out colors, and also by sorting out the sizes of the stones, the children began to incorporate "units" into an abstract mosaic design. It was observed that even in cases where the children seemed to fill in the space without to much concern for compositon, and made what we call an "abstract" designs,there had been great planning in the area of "balance" and arrangement of each an every stone. We have labeled this phenomenon "balanced,segmented pattern"(Nikoltsos,1996,p. 89).

It seemed that young children naturally created patterns and designs in a very logical way (Winner,Mendelsohn,Garfunkel,181,pp. 198-199) balancing and counterbalancing the stones in their mosaics. It was as if they were crawling or walking or dancing in the small space where they were creating, and they were doing it in an orderly and symmetrical manner. In mosaics, they did not make a full circle in one flowing,uninterrupted motion as they do when they paint or draw (Mazaraki,1987). It seemed more natural not to do so, but instead they construct a circle slowly, filling in a left segment, and then a right segment, a lower segment and then an upper segment. Even the stones that fill-in empty spaces are placed in a balanced manner.

With more control, or with the inspiration of a treasured "found" object as a centerpiece to their mosaic design, the children began to form spirals or even "frames" within their work. This recalls the first patterns that we see in the floor mosaics at Gordion or at Olynthos, where geometric order and symbols were used. The most common geometric symbol made by the young children was the circle, or circular forms.It is the symbol of self, of the cosmos and of "ultimate wholeness" as Karl Jung has noted (1964,p.259).

In most cases, the young children followed the shape of the moulds that were used to hold the cement mortar base. If rectangular metal or plastic pans were used, then the pebbles or stones followed straight lines. When plastic dishes or containers from ice-cream or yogurt were used,then

a more circular pattern was made. Simple designs were made by placing an an economically small amount of stones: one to the left, one to the right,one in the center, and perhaps a few in a row, thus creating one of the most basic symbols for young children: the smiling face (Smith,1979,p.59). A more developed design was made when the child broke away from the given form of the mould and created a new shape within.This is apparent in the example of the "squared circle". Again, the design was made in segments, balancing the upper left area with the lower right,etc.

After many experimental mosaic designs, the children began to make "pictures" with the stones. At first glance one might think that there was an example, a "model", given to the children to copy. On the contrary, it would be depriving childen the use of their own creative and artistic skills to give them ready-made pictures or designs to copy (Vygotsky,1978 ed.,p.86).The simple "flower" design was made from sea pebbles that the children "played with" in the sand and/or arranged on the table, before placing into the cement mortar . This type of "pre-planning" was very helpful and the children were able to visualize what the end result of their mosaic would look like, and they began to form shapes and see the "wholeness" of their designs.

The "flower" design is a very common image in young children's mosaics. It is really a very basic symbol that man has used over the ages similar to a star or a sun or the mandala (Jung.1964,p.240). It is also simple radial symmetry (Beruszka,1977). Preschool children and young grade school children usually only formed the cross and "x" designs, however children twelve years of age and older would continue to fill in the triangular shapes in the background with other stones. This radiating symbol can be seen from the simple cross patterns at Gordion to and through all the starbursts designs found at Olynthos,Eretria and even in the Christian stars and crosses in the mosaics in the churches at Ravenna,Thessaloniki and elsewhere.

More advanced for the preschool child, and more developed in mosaic design is the image of a figure. Here again we see the basic circular and radiating line symbol of early man. Different types of figures were made in mosaics when the children found unusual shaped stones, or a worn piece of tile or glass. A "found" piece acted as the central shape of the figure, a"skirt" or "arms", and the other elements of the body were built up around it. The children "transfered the meaning" from triangle of tile to triangle of skirt (Vygotsky,1978,p.98).From simlpe forms of the stones, the child developed his or her own design,expressing an image in his own language of symbols (Gardner,Wolf,and Phelps,1990,p. 79).The children also had to solve space

problems and make decisions as to which size of stones and which shape of stone is most appropriate for details. Older children made the figure with a series of small stones or pebbles placed very close together. This type of work is similar to the figures made in the Hellenistic mosaics at Pella,

Besides using the stones and pebbles to make mosaics in the cement mortar, we noticed that during the free-play time, the children enjoyed "drawing" on the table with a series a stones. They also constructed games. like the "maze" and played with a stone "mouse". By drawing a picture on paper and then gluing the pebbles or stones along those lines, children made the basis for the indirect mosaic technique. This was the method used often in the Roman times, when the artist did a detailed "emblemata" in the workshop and then transported it to the site. The children spread a layer of quick-drying plaster atop of their stone "drawings". When the plaster dried, the entire piece was turned upside-down and the paper was removed, often using a little water to dissolve the glue. The remaining image is a mosaic in reverse of the drawing.

One of the most common images in young children's drawings is the symbol for "house". This is easily made by the children when using the afore mentioned indirect construction of mosaics. It was interesting to observe that young children who made mosaics in round containers, using the direct method, did not make house designs. However, in more advanced work, when the children pre-arranged their stones into "pictures" on the side of the mould before the cement mortar was poured, then there were several attempts to make "houses", some even resembling the face symbol (Meredieu,1981,p.78).

The theme of the "house" for a mosaic design was very appropriate and very successful, after a visit with the children to a construction site. At the site, the foreman allowed the children to collect gravel stones and broken ceramic brick pieces. These materials were easily translated into mosaic tesserae for house designs: gravel stones became the square outline for the wall of the house and the red ceramic pieces filled in the triangle of the roof. For the children, the materials functioned in their proper symbolic place (Smith,1979).

Conclusions

There are no limits to the types of symbols or images that the children could create. Some chose to make small geometrical and symmetrical designs that are kites, boats or fantastical machines. Other children enjoyed

creating natural forms like the flower, the sun,sea,etc. One could also mention the use of small half-shells that made butterflies and bees, Often, as we have seen, the material used for the tessarae encouraged the child to create an image.

Whatever the image was, young children's mosaic designs remained simply a picture "on top" of a cement background. The designs and symbols are depicted in a linear way rather than with whole shapes or forms. There may be a border of pebbles or stones, somewhat like a frame, but up until about 10 years of age, one does not see the advanced mosaic technique of filling in the background or creating "movement" through the placement of the tessarae in a flowing series of curves,etc. Older children and young adults spend more time in the planning of a mosaic than the more instantaeous method used by very young children. Finer mosaic designs are made by older children who have already developed a larger visual vocabulary of symbols and images, and they also have developed artistic and constructional techniques.

With older children and young adults, the mosaics are also made with a wider variety of materials. We see the sea pebbles used in natural greys and cream tones, similar to the mosaics of Pella. Colored gravel stones recall late Roman and Early Christian mosaics. Broken, shining ceramic kitchen tiles resemble the Italian glass tessarae used at Ravenna. And even more precisely cut tiles, placed in accurate form and arrangement reflects the fine art of the Byzantine period.

It has been said that if one watches the infant grow from the crawling stage to the moment when it stands erect and begins to walk and then talk and then write,etc., one is really watching the entire development and evolution of mankind from its early stage during the cave age up until the technical advancements of the modern era. We can also conclude that through our observatons of the youngest child's first exploration with pebbles and stones, to making images and symbols and then advanced designs in mosaics, we have seen the artistic, symbolic and creative development of mosaic making which also parallels the development of the art of mosaics, the art of stones, over hundreds of centuries.

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