PRE-COLUMBIAN SILVER AND CLAY AS A GUIDE
TO A CONTEMPORARY COMBINATION
OF SILVER AND POTTERY

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CHAPTER I

THE PROBLEM

I. STATEMENT OF THE PROBLEM

This study of pre-Columbian silver and pottery forms was a search to determine how the pre-Columbian artist was influenced by the cultural and historical period in which he lived, and to use the knowledge gained in the research for original aesthetic projects made by uniting clay and silver.

II. SIGNIFICANCE OF THE PROBLEM

The purpose of this study was to point out the difficulties of combining clay and silver, to develop innovations and to produce a functional, decorative project uniting clay and silver. This work was concerned with creation and adaptation of a contemporary theme, influenced by the pre-Columbian motif.

III. PLAN OF DEVELOPMENT

The pre-Columbian culture of South America was studied to determine which cultural and historical influences may be observed in silver and clay as art of this period. The clay and silver art objects of the pre-Columbian culture have
been studied by observing actual pieces at the Des Moines Art Center and in a private collection owned by Dr. Herbert Alberding of Simpson College. Further observations were made by studying pictures at the Drake Library to obtain a feeling for the motif. This research was reviewed in Chapter Two. The development of silver and clay as art media was researched to best determine how these two materials might be united.

After determining how the two media might be combined, thirteen experiments were made using modern equipment. A neoteric silver and clay motif reflecting both the pre-Columbian influence as well as contemporary standards was the aim of this project.
CHAPTER II

REVIEW OF THE RESOURCES

I. HISTORICAL AND CULTURAL BACKGROUND

The pre-Columbian cultures, A.D. 1000 to A.D. 1550, after establishing themselves by migration from Siberia across the Aleutian chain, seemed to follow basic similarities in development that other cultures experienced. The developmental pattern was "An agricultural development and subsequent economic expansion; problems of increasing population, also the rivalry of belligerent neighbors plus the stimulus of trade."¹

The evolvement of the use of clay and silver in pre-Columbian patterns was unique because the culture was isolated from the outside influence of Western civilization as it is now known. Therefore, the motifs of the art works would have a unique beauty all of their own.

The exchange of ideas by the artists from one geographic area to another, as in other areas of learning, was slow in developing. Yet some of the pre-Columbian artists' work in silver far surpassed much that had been accomplished or developed in the more advanced cultures of the world. New

evidence indicates that contacts, some maritime, between the Northern Pacific Coast of South America and the Middle America is now a known fact. ¹

Central Mexico appears to have derived its early metal artifacts from the South; most of the types found in this area also occur in Southern Mexico or in the Maya area. It is likely that trade or stimulus diffusion began quite early between the Southern Maya and areas to the North, extending ultimately to Central Mexico. It is even conceivable that the initial introduction of metals in the Southern Maya area was accompanied by more extensive contacts between Central American groups and Southern and Central Mexican cultures. Whichever was the case, transmission from the South was extremely rapid, resulting in the appearance of metals in Central Mexico by about A.D. 975 or 1000 at the least.

Although Central Mexico was certainly a center of the metal-working industry for some time prior to the Conquest, Archaeological evidence from the area does not indicate such a status in earlier times. ²

The pre-Columbians developed a wealth of ornaments fashioned in gold and silver of highly conventional style and dominated by curving lines and intricate movement. The motifs developed by the craftsmen of pre-Columbian cultures centered around the basic areas of animal and geometrical designs. While most of their work had a congested feeling, it was basically symmetrical with repeat


lines. Motifs were symbolic, vigorous, bold-flowing forms. There was generally a tendency to accommodate the design to a framework of parallel bands like the space on lined paper. There was a consequent replacement of curved lines by straight ones.

The realism which plays an important role in our art was not a primary aim of the pre-Columbian artist whose main purpose was the expression of an idea, often highly complex, in which the imitation of nature may frequently have been irrelevant.

II. THE DEVELOPMENT OF PRE-COLUMBIAN CLAY TECHNIQUES

The development of clay of the pre-Columbian artist was believed to have evolved much by accident in the same way that other cultures developed their clay art, by trial and error.¹

The pre-Columbian lined his basket with clay in an attempt to waterproof it. He learned to fire the clay by accident. After learning about firing, he enlarged upon his clay methods by making pinch pots and by using the coil and slab methods of building. Ecuador has given the world

the earliest pottery so far discovered anywhere in the new world. It dates from 3000 to 2500 B.C.¹

This early craftsman became quite skilled not only in forming his art object but in preparing the clay mixture itself. He knew that clay composition could not be pure and must contain other ingredients. Materials such as mica, quartz crystals, volcanic ash, shell fragments and crushed pottery have been found in pre-Columbian clay work added to strengthen the clay and cut down on shrinkage.

The techniques used most by these cultures were block modeling, coiling, slab, and moulding. Block modeling consists of hollowing out the center of a ball of clay and thinning the sides by hand to shape the pottery form. This method is still done today in Santa Apolonia, Guatemala. Coiling is the most common method used in our hemisphere. This is the process of rolling the clay out into ropes and coiling it around, raising the walls and smoothing them as the bowl raises. Pastillage decoration, in the form of strips or coils of clay pressed on clay forms to represent lips, eyes, necklaces, etc., was applied. The slab method of building is done by working the clay into a sheet. Sections are cut out and assembled into pottery of decorative forms.

Moulding was also employed by the pre-Columbian cultures. They accomplished this by using bisque clay for their mold and pressing semi-moist clay into this negative. Some or part of the pottery forms and decorations were done in this manner.

Water jugs, cooking pots, cups, plates and mugs of many shapes have been found. Besides these many utilitarian forms, there were basic shapes such as ovoid, cylindrical, and truncated pots some of which were footed, tripodal and tetrapodal. There is evidence of the combining of pots into double, triple and quadruple vessels.

Most of the ovoid and cylindrical forms appear in all civilizations, especially globular pots, cups, bowls and plates. The aryballo is a kind of amphora, which is pointed at the bottom, with two handles in the middle of the belly, and a flared neck.¹ (See Figure 1.) The "tear drop" pot, a form of the ovoid pot has been found only in Ecuador. This may be seen in Figure 3.

¹Lehmann, op. cit., p. 22.
Figure 1. Pre-Columbian arybello-styled pottery.
Surface decoration of almost all cultures was made by similar methods. One of these methods was incising. "We mean by this term decorations made by removing clay from a pot while it is still wet, by means of a spatula or pointed tool."¹ The engraved and incised decoration of almost all cultures were made by this method. Pastillage was the adding onto the wet surface area by use of coil strips. The most common covering was a natural slip in liquid form mixed with a ground color. This aided in waterproofing. The pre-Columbian often used a repeated geometric design. (See Figure 2.) Possibly this was related to having first fired his clay as a lining for a basket. Weaving as it imprinted his clay provided a satisfying decorative effect.

Animal or vegetable base paints were applied after slip for decoration. Polishing of clay by rubbing with stone, pieces of leather or cloth was also done as it is today.

Open fire, earthen ovens, and some brick kilns were developed. The pre-Columbian artist primarily used low-firing clay and clay slips—ground color, of mineral composition. These slips were put over the natural color of the clay to decorate and waterproof the object. These early

¹Ibid., p. 29.
artists developed some ceramics with metallic luster.

The lustre peculiar to this ceramic for a long time went unexplained. Only in the last few years have chemical analyses and thermal-reaction tests shed some light on its composition. The slip covering the objects is a clay which possesses unusual properties, both chemical—it contains a high proportion of iron and aluminium and thermal—raised to a certain temperature in a reducing atmosphere, it vitrifies. This slip must therefore be considered as a glaze. Although it is a natural clay to which no flux has been added.¹

As a whole their clay forms were superior: freely expressed yet realistic; copied from nature yet creative; angular yet delicate. Without technical knowledge they became refined in this craft.

¹Ibid., p. 21.
Figure 2. Pre-Columbian pottery form.
Figure 3. Pre-Columbian tear drop shape pottery form.
III. THE DEVELOPMENT OF PRE-COLUMBIAN SILVER TECHNIQUES

The working methods and technique of the pre-Columbian craftsmen are not too well known, but the facts that have been established are listed as follows:

Mining of gold. Mining of gold of this period was not mined but picked up from streams.

Silver mining. Silver mining was done by digging shallow, vertical, open-mine shafts not much deeper than a man's height. Horizontal mines were introduced by the Spaniards.

Smelting of ore. Smelting of ore was done by mixing the gold with crushed charcoal and placing it directly in the fire. The metal was fused by men blowing through reeds into the fire to raise the temperature. There were no bellows for blast furnaces used by pre-Columbian craftsmen.

Hammering. hammering silver ore was carried out by beating the ore between smooth stones. The pre-Columbian artist had no anvil, but flattened and smoothed the silver using one stone against another. Much of his work was done this way, starting with the crude metal and patiently hammering with dice-shaped stones which had rounded corners.
for fitting in the hand. This stretched metal to the utmost. (See Figure 4.)

Soldering. Soldering was performed by placing solder on the edges to be joined, and this would fuse when heated with a blow pipe.

Casting. In using the lost wax casting process, the pre-Columbian silversmiths were masters. With crude equipment such as beeswax, clay, charcoal, and open fire they were able to cast hollow objects. This the Europeans had not done until after the Conquest. (See Figure 5.)

Inlay of metals. Inlaying of metals by hammering of one metal into another was employed. The fusing of metals by heat was also mastered. Silver and gold were decorative and served a utilitarian function but were not used as monetary exchange.
Figure 4. Example of pre-Columbian hammered silver technique.
Figure 5. Example of pre-Columbian hollow lost wax casting technique.
IV. CONTEMPORARY ARTIST CRAFTSMAN

Just as the pre-Columbian artist was influenced by the cultural and historical period in which he lived, so is today's artist influenced by the twentieth century culture in which he lives and works and creates. Today's artist is confronted with his traditional difficulty in earning a living; few contemporary craftsmen may work with a free hand and be original. According to Glenn C. Nelson:

The rise of large factories with mass production methods placed cheaper ware upon the market. But it also took the responsibility for design away from the person best equipped to understand it, the craftsman, and gave it to the factory manager and salesmen whose chief criterion was profit.¹

Like the pre-Columbian who was also faced with "economic expansion", the potter and the silversmith also fell victim to monetary considerations. They are at the mercy of the tourist trade which demands hand-built souvenirs copied from traditional designs. This criterion likewise often controls the contemporary potter and silversmith who find it is easier to work with industry or to teach, which assures them a set income instead of starvation. This is the view of the contemporary jeweler Ronald Pearson.

The contemporary artist has an unprecedented market for his wares. While some artists object to the commercialization

of their art, others feel there is real dignity in creating and designing for mass production and in making things that they know have a place to go. As Krevolin and Constantine, a pottery team, stated:

In our pottery we use the same approach as any designer working for a manufacturer. We assess our available time, materials, equipment. Then go out to discover what we can create with these that people would buy: There's always some new idea and we're spending our energy on things people really want. ¹

This view is shared by a jeweler, Margaret Depatta, who said: "I believe the artist has a responsibility to relate to present society and its methods and I believe there is great validity in designing for production." ²

It is a difficult problem for the contemporary artist to work out—satisfying his artistic morals and at the same time making a supreme effort to combine good design with salability. Often the craftsman can't mature if he pursues the "fashion trend." So he must constantly experiment to be different even to such an extent that the results border on the bizarre. For he knows almost any hand-made object can be duplicated or adapted by industry.

¹Pido Smith, "Krevolin and Constantine," Crafts Horizons, XX, No. 5 (September-October, 1960), 16.
²Yoshiko Uchida, "Jewelry by Margaret Depatta," Crafts Horizons, XXV, No. 2 (March-April, 1965), 22.
Although many artists feel dignity, responsibility and fulfillment in mass design, some feel that today's industrialization tends to stifle artistic creativity. How serious this stifling may be is pointed out by Ed Weiner, a jeweler:

The contemporary craftsman designer who consents to design for industry has ipso facto agreed to dilute his intentions to external factors beyond his control. He agrees to submit his work for aesthetic judgment to persons who are neither his peers nor qualified in any way except financially to make this judgment. Some designers flourish in this atmosphere, but I can recall only once in twenty years when a meaningful revelation in design came from this arrangement. I refer, of course, to Charles Eames and his designs for the Herman Miller Furniture Company.1

A craftsman is more than a designer and a technician. To survive, he has to be a little of many things—he has to know about marketing, contemporary trends, historical traditions, how to organize work and get things done. It is just this variety of activity which appeals to many craftsmen—variety and an independent way of life in which the direction of one's effort can be controlled or altered. No doubt each era had its lures to distract the lonely creator—no doubt even a pre-Columbian "original thinker" met with frustrations, rivalry, and defeat. No doubt only the hardest, the most disciplined survived and passed their art to succeeding generations.

And so today, in spite of crushing commercialization, apathetic attitudes and justifiable rationalizations, the creative artist finds the twentieth century a fertile era and individual expression is flourishing in every artistic medium. Among the patient craftsmen who allow their designs to mature, a contemporary silversmith, Ronald Pearson, who is flexible in his approach to metalwork and yet direct in his approach to design, had these comments about his craft:

I believe that designing must be a continuing, consuming and lifelong process. One that requires considerable self discipline and constant practice. Sometimes I must draw for several days before I get the feel of a new project. However, once thoroughly involved, I can often work directly with the material.\(^1\)

In many crafts today we see a great desire to experiment and also a desire to be different; it is here that the craftsman and industry start to travel different paths. The creative potter or silversmith, who is able to compete with today's commercialization is the one who appeals to the aesthete. As Robert von Neumann stated:

An object need not be ornate or complex to be decorative. It need only to capture the attention, then to stimulate curiosity and allow for leisurely contemplation of its uniqueness. It must, above all, be stimulating enough to bring attention to itself again and again. In this respect, all successful art is decorative; it enriches

\(^1\)Rhodes, loc. cit.
its environment as well as the visual experience and knowledge of the viewer.¹

There are few frontiers left today where an individual can strike out on his own and expect to lead a creative, exciting and free life. Being a craftsman, however, is one of these. These artist craftsmen are now groping for a new aesthetic to meet the needs of our time, or perhaps it is a new anti-aesthetic to break visual patterns that no longer suffice.

The pure craftsman is the one who finds himself unable to conform. Much in evidence today, the pure craftsman becomes a voice in the wilderness of environmental aesthetics, resisting the seductions of object-art. He joins hands with his artistic pre-Columbian ancestors.

This aesthetic search challenges even mass production which can never compete with the urge of the creative artist who is impelled to satisfy his inner self-creativity and self-expression. According to John Frip:

If I have to please one thousand instead of one, it is a slightly different problem. . . . When you have to please fifty thousand you do not try to project yourself, your own image, your own ego.²


It is literally impossible for the original thinker to be thus shackled. He finds irresistible the urge to express himself; there will always be a demand for the soul-products of the artist even in a profit-oriented society. He senses the artist's soul in a crude pre-Columbian bit of pottery or in a Cellini masterpiece. He is a continuing link in the cultural chain. In the twentieth century, the American craftsman reflects his artistic heritage. According to Rose Shrivka, the contemporary American craftsman evolves in this manner:

He is an intellectual, the product of the university workshop or specialized school with study in painting and sculpture as well as design and craft techniques. Having turned to the craft heritage of the rest of the world for lack of an indigenous one, he has had to study. Instead of learning his technique from the peasant craftsmen, he does his research in books, in the workshops of the university and by traveling to those countries with a craft tradition. He is, furthermore, a veritable melting pot of national origins, with the professional artist-craftsman who emigrated from Europe and the Orient making a decisive contribution. As a group, therefore, U. S. craftsmen are most receptive to new ideas, most intent in search of their craft continuity.1

V. THIS ARTIST'S USE OF PRE-COLUMBIAN MOTIFS

The artist of this project, like other Americans, was receptive to art works of merit: unique, decorative, and appealingly novel; and so he utilized the rare combination

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of silver with clay--modern, yet reminiscent of an early culture.

The designs that evolved from the artist's exposure to pre-Columbian motifs developed as follows: Since the bulk of the pre-Columbian clay forms were utilitarian, the forms of this project were developed to serve a useful purpose; he sought simplicity of line, as well as an elegance of detail.

The pre-Columbian potters hand-built all their pieces; but the wheel was used on all but one pottery form of this project.

Some of the silver motifs were inspired by pre-Columbian examples of repeat design, horizontal or vertical parallel line design and part of an animal form. These designs were then united with clay in many different techniques.

The pottery forms and silver shapes were not imitated; they were used only as inspiration and no attempt was made to duplicate the pre-Columbian motifs. Only the feeling of design was utilized.

The clay forms refused to take on an uncontrolled, loose, free feeling that may have been desired. They remained somewhat formal and stiff. Still the texture and color of clay and glazes gave a desired contrast in relation to the silver.
For a craftsman who had been exposed only to a western civilization background, this study of pre-Columbian artistry led to an awareness of past cultures, their restrictions and their accomplishments. Combining these two media seemed to produce a rapport with artists of pre-Columbian culture.
CHAPTER III

STEPS AND WORK OF STUDY

There are 13 works combining clay and silver in this study. Figure 6 is an example of the pre-Columbian pottery which influenced this experiment. This separately constructed pot was also used by Grecians, as well as Phoenicians, of the Western culture. Ring bases may have been added later as cultures developed. (See Figure 6.)

I. BASES AND LIDS

Figure 7 illustrates the angular design after the geometric feeling of the pre-Columbian motif. The silver base was designed and made after the bowl was thrown, bisque fired, glazed and glaze fired.

No difficulty was encountered in this problem.

This jar (Figure 3) was made first in the same fashion as Figure 7. This time, however, a lip was planned to receive a lid. The bowl feeling was obtained from the example shown in Figure 3.

The silver was raised, simulating the hammering technique of pre-Columbian. The handle was cast by the lost-wax technique, using clay and charcoal core with clay pins. The handle and the interior of the lid were attached
to the raised lid which was designed in a repeat feeling of the bowl contour. This design was developed from feline prominent teeth found in many pre-Columbian motifs.
Figure 6. Pre-Columbian pottery form with stand.
Figure 7. Contemporary example of pottery with silver base.
Figure 3. Contemporary pottery form with silver lid.
II. UNSUCCESSFUL PROBLEMS

Attempting to unite the two media by tension resulted in failure because silver lacks resilience and is too soft and pliable. (See Figure 9.)

Soldering through an opening failed when the clay was too thin.

The base (on Figure 10) with interlocking silver and clay was successful because the clay was thick. The interlocking was unsuccessful on the bowl where the clay was thin. Concentrated heat broke the areas that had openings to receive silver.

Suspending silver through apertures in the clay failed because concentrated soldering heat separated the clay which had successfully undergone 2300°F.
Figure 9. Experimental silver tension on clay.
Figure 10. Interlocking silver to clay.
Figure 11. Example of suspending silver through opening.
III. SUCCESSFUL UNITING OF CLAY AND SILVER

Seven vessels were created which can be classified as successful attempts at combining clay and silver.

The two silver banding bowls shown in Figures 12 and 13 were made using the same technique. They were thrown on the wheel with slight incision cut in sides to receive silver bands. The pots were then bisque fired, glazed and glaze-fired.

The silver bands were formed smaller than the incision in the bowl, then soldered and hammered slightly to stretch them to nearly the proper size. The final fitting was accomplished by heating the silver, holding it in place until it cooled, shrank and fitted into the incision.

Parallel bands were developed after learning that much of the pre-Columbian design was held within a framework of parallel bands.

Much clay was left exposed and unglazed because the color and texture would enhance the smooth, shiny surface of the silver, and because the pre-Columbian had developed only slip plus some small number of metallic glazes.

These two experiments were considered successful because the silver united amicably with the clay to produce decorative, pleasing objects.
Figure 12. A successful example of inlay silver in clay.
Figure 13. Successful example of inlay silver in clay.
This (Figure 14) was a successful attempt to interlock silver with clay.

The bowl was thrown on the wheel, the sides were left thicker and holes were cut at the leather-hard stage. Then the bowl was bisque-fired, glazed and glaze-fired. Silver legs were cut and the soldering process started to fasten legs to bowl. Dimensions were altered because the bending of silver in place became a problem. The design was also changed to achieve stability and visual balance.

The silver soldered successfully because the pot was pre-heated with a torch, and the area receiving silver was thick, allowing retention of heat and resistance to strain.

Pre-Columbian designs used two main slip colors, brown and red. The brown was left exposed in this pot.

The idea for this experiment (Figure 15) came from the pre-Columbian pot pictured in Figure 1. An attempt was made to place suspended openings on the exterior when the clay was leather hard. The pot was bisque-fired, glazed and glaze-fired.

Silver was cut and soldered. Soldering became a problem which was resolved when the pot was kept warm by placing sand inside and pre-heating. Holding the silver in place was also a problem during soldering; when the pot
was laid on its side, sand escaped and heat was lost. Asbestos was used throughout, but torch burns showed up on the clay surface in the area of the soldering joints. These scorch burns could no doubt be eradicated by using easy-flow solder and wet asbestos. This type of silver suspension lends itself to artistic experimentation.

The next experiment, Figure 16, was an outgrowth of the attempted soldering through an opening illustrated in Figure 10.

This second attempt used tension to hold the silver in place in pre-cut holes. Proportions and accuracy were difficult to maintain and shims were used to hold the silver tightly within the holes. Inaccuracies in both clay and silver were not completely eradicated.

Angular clay design blends with the modernistic open handle silver design. A later experiment (Figure 13) stemming from this problem was successful.
Figure 14. Successful example of interlocking silver in clay.
Figure 15. Successful example of suspending silver through clay openings.
Figure 16. Example of silver held by tension.
The motif of the pot shown in Figure 17 was suggested by a North Peruvian picture of a stirrup jug head shape with a round silver nose pendant and earrings.

The silver was pre-shaped and the holes pre-cut. Scorching during soldering still presented a problem, unknown to the pre-Columbian who made no attempt to solder, but simply crimped the silver in place. Soldering, a prime challenge to this artist, was attempted in order to produce a permanent union.

The problem in Figure 18 was successful. No heat was needed to come near the glazed handle to attach it to the silver base and bowl, resulting in a functional, decorative, contemporary project with a pre-Columbian influenced motif.

This is a successful contemporary example (see Figure 19) of slab and wheel made pottery form with suspended silver dangling ornaments. This was done without the use of heat, from pre-cut openings, utilizing repeat pattern motifs.
Figure 17. An example of dangle ornaments.
Figure 18. Successful example of combining with a bezel.
Figure 19. A successful example of suspended silver dangling through openings.
CHAPTER IV

CONCLUSION

Combining clay and silver as a decorative media no doubt is not new: the pre-Columbian had clay vessels with silver lids, as well as silver ornaments hanging from openings of clay heads and other materials such as fabrics. There is little technical evidence, however, that clay could be combined with silver. This project successfully united these two media by inlaying silver with clay in a contemporary design influenced by pre-Columbian motifs.

The soldering process presented the greatest problem. Inlaying or interlocking the clay and silver with the soldering process resulted in many failures. As long as the soldering process was not done in connection with a finished clay object, however, the process was usually satisfactory and there was no problem except fitting.

No matter how detailed the planning, the media changed constantly because of the nature of the two materials. After firing, clay becomes hard and rigid; silver, though quite firm, will yet stretch and bend. Because of the incompatible natures of the two materials, the researcher encountered many failures. Failures resulting from this intrinsic incompatibility of the media were overcome somewhat by working on a percentage basis. Building more than
one model allowed for chipping, shrinking, warping and blowing up as well as for accidents in glazing, glaze firing and soldering.

This study demonstrated that it is possible to wedge clay and silver into a unique decorative combination. Because clay and silver are on opposite ends of the scale: low to high cost, from matt to high shine, and porous to non-porous, this combination will appeal only to the aesthete or the individual artist who will be willing to face the challenge of high cost and difficulty of uniting these two media. Commercially, this difficult combination could be done on a limited scale. To an individual artist, the combining of these media presents an interesting challenge, making him aware of the artistic value of 3000 year old art in producing a nectoric motif.
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