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### P A P E R S

#### A BACKGROUND FOR CERAMICS\*

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This is the Seventh Annual Edward Orton, Jr., Memorial Lecture.

The progress in industrial ceramic operations in the United States has been extremely rapid since the turn of the century, and today this country probably leads all others in efficient quantity production of many ceramic products, such as vitreous enameled ware, sanitary porcelain, and hotel chinaware.

It is within only a relatively short time, however, that interest has been aroused in the nonindustrial phases of ceramics, as in the fields of art, decoration, and education. In these latter fields, there is a wealth of unique and interesting background material which will undoubtedly still further attract and hold the interest of those who are acquiring but casual acquaintance with this grand old art.

Ceramics, chiefly in the form of pottery-making, is now offered in many public-school and college courses, Y.W.C.A. classes, art schools, trade schools, and other educational organizations, including even WPA Federal Art projects, schools for the blind, and as a project in occupational therapy.

An informal survey in the public schools of the State of New York in 1936 revealed the fact that ceramics was being taught in forty schools located in thirty cities. This instruction varied from merely incidental instruction of a few students in "interest groups" with the production of a few shapes of dextrine-hardened, unfired clay to major instruction covering all branches of clay working in well-equipped shops, the courses lasting a year or more, involving hundreds of pupils, and resulting in the production of thousands of pieces of which many were salable.

If the conservative average is assumed to be thirty ceramic pupils in each of these schools, there are then twelve hundred public-school pupils in New York State annually receiving instruction in ceramics, which is understood to mean "the art of making things of baked clay, as pottery, tile, etc." There are probably eight

to ten times this number of public-school pupils receiving ceramic instruction throughout the country or, conservatively, ten to twelve thousand.

Within the short space of five years, about fifty to sixty thousand youngsters in our public schools receive some sort of instruction in ceramics, in addition to adults in public-school evening classes and other adult educational groups, and they are thus brought into brief contact with the oldest, most natural, broadest, and most generally useful of all arts.

There are also thousands of amateur and professional designer-craftsmen producing personally designed and fabricated ceramic ware on a small scale, either as a hobby or for private sales.

Such far-flung interest in nonindustrial phases of ceramics is significant.

The wide-spread teaching of ceramics undoubtedly indicates its desirability both as to student interest and educational values. In the opinion of the speaker, this evident belief in the value of ceramics as an educational subject is thoroughly well founded and fully justified.

Man is by nature a potter in that everyone likes the "feel" of soft plastic clay or of clay mixtures. To test this, hand any casual visitor a small lump of soft clay. Is it held listlessly or immediately dropped? No! The fingers invariably start fashioning the clay into some simple form, perhaps only a ball or "pill," but more often into a little saucer or dish-shaped piece. The piece of clay is usually retained and worked into various simple shapes before he departs.

This universal and immediate liking for the feel of clay has proved to be of great practical value in claiming the interest and attention even of the most difficult "problem" pupils.

Mabel C. Brady of the Haaren High School of New York City, in speaking before the Art Division of this Society at Baltimore in October, 1936, said, "It (ceramics) has served not only as a means of creative expression and development of art appreciation in the average student but has been of great value in socializing many problem students otherwise antagonistic

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toward any other form of instruction or guidance." The "problem pupil" is happily in the minority, however, and the interest developed by ceramics finds equal, if not greater, values in normal and even in advanced groups.

Aside from immediate appeal to the fingers and to the desire to "make something," the clay working branch of ceramics has been found to possess definite and important educational values.

Raymond P. Ensign, Executive Director of the National Association for Art Education, in communicating his views upon ceramic instruction to the Art Division of this Society at Baltimore in October, 1936, made these comments:

Some years ago, millions of dollars were spent in the school systems of America in equipping shops with heavy, fixed, and costly machinery for the purpose of teaching woodworking, tinsmithing, and other trade processes. I sometimes question the real educational value to an adolescent youth of his part in throwing a switch or moving a lever back and forth for the sake of seeing a machine turn out a galvanized iron cornice. Such a cornice is a "fake" to begin with, imitating in its form traditional wood or stone construction. Secondly, only a small proportion of the boys would ever meet sheet-iron cornices face to face in after life. Thirdly, how much did the average student's young mind and soul unfold while the machine's inner works labored to give forth the iron molding?

I can not help contrasting such a situation to the stimulating one which confronts a young potter before his wheel. Here his creative imagination is challenged and given scope for productive experimentation. Here his mind, eye, and hand learn coordination and control.

Here he learns about the functioning of line, form, and later of color in the achievement of a product basically sound and aesthetically satisfying. And here his experience and his product may have large implications in relation to his afterlife in home, business, and community.

We hear much in educational circles these days of "integration." I can think of no school activity offering a more fruitful field for the integration of other *subjects* in secondary schools (and hence fruitful in the integration of the expanding *individual*) than ceramics. How aptly his research into the development of pottery ties up with his survey of history. His concern with materials and costs may well enliven his study of economics and mathematics. His investigations into the raw materials of ceramics and their sources may well quicken his interest in the geography of world commerce. His study of clays and glazes may make rich his laboratory experiences both in chemistry and physics.

A subject of such immediate appeal and high educational value offers an unusual opportunity as an exploratory means of ascertaining other pupil interests and of expanding the cultural values of education practically in all directions but, unfortunately, it is only the occasional teacher who possesses the broad knowledge of the ceramic arts to present its highly interesting and stimulating background to classes in ceramics.

Orton's pioneer work at the turn of the century not only created an interest in the technical or engineering branch of ceramics, but it led to the training of chemists and engineers qualified to devise and execute the most effective technique for the industrial production of all types of ceramic ware. In other words, Orton provided a much-needed background for the future commercial production of ceramic products by pointing out

what had been lacking in the technical literature and training of his day, how the situation could be remedied, and how industry could profit from technically trained men. His lifetime was spent in this important work, and today many of our leading colleges and universities offer complete four-year courses in ceramic engineering corresponding with those in other lines of engineering, such as civil, mechanical, mining, and chemical.

Orton made no attempt, however, to include in his work other than the engineering and manufacturing phases of the great ceramic industry.

In view of the widespread and increasing interest in ceramics, of the unusual cultural values inherent in this subject, and of the greater pleasure and zest that a broader knowledge of the art will provide not only for students but for designer-craftsmen, connoisseurs, collectors, and even the discriminating user of ceramic ware as well, it is highly desirable to impart more information concerning this ancient and enticing art to the thousands brought in brief contact with it than has been done heretofore—in other words, to furnish a better background for the ceramic arts as distinguished from ceramic industrial production technique.

In some schools and social service classes, a commendable collateral program is used with ceramic classes; in one senior high school in the State of New York actual pottery-making is supplemented by a survey of the history of ceramics, studies of the influence of climate, temperament, and religion upon the potter's art, and by trips to museums and to large stores to develop appreciation of ancient and modern work and discernment between the excellent and mediocre. Such cases, however, are rare, and the usual class in clay-working learns but little more than the work laid out for it, although it is nearly always intensely interested in such work.

What is to be said of ceramics to all those who are passing by? What is represented by the window dressing of "pottery classes?"

#### I

"The world is so full of a number of things  
I am sure we should all be as happy as kings."

—Robert Louis Stevenson

Even before a historical development of the subject, let us make clear that the term "ceramics" is no longer confined to the very narrow meaning of the original Greek word from which it was derived, but is today generally accepted by those engaged or interested in ceramics as "comprising all products fashioned from silicates or oxides and rendered durable in form and composition by a heat treatment applied at some stage of the process."

Ceramics is thus the art of producing from natural inorganic materials with the aid of heat a bewildering number and variety of articles with an extremely wide range of usefulness and beauty.

The tabulation of ceramic products (Table I) has been prepared to illustrate the wide scope of the field, this form of presentation having been suggested by a somewhat similar tabulation published in Ceramic Catalogs in 1934. (For Table I, see pp. 278-79.)

It is obvious that not more than a very general classification can be presented with a fair degree of completeness and clarity. Anyone interested, however, will be able to fill in specific items in great number under most of the classified groups.

There is something to be told, therefore, about the variety of ceramic products and of their great usefulness to the human race.

## II

"And while he plied his magic art—  
For it was magical to me—  
I stood in silence and apart,  
And wondered more and more to see  
That shapeless, lifeless mass of clay  
Rise up to meet the master's hand,  
And now contract and now expand,  
And even his slightest touch obey."

—"Keramos," *Henry Wadsworth Longfellow*

While indeed fascinating and indispensable as a "first call to ceramics," the formation of articles from soft clay upon the potter's wheel does not constitute the entire art, and there are other branches which may prove of equal interest as to their susceptibility to artistic treatment, technique of production, and variety and beauty of the product.

*Tile*, for instance, require an entirely different method of production and are useful in altogether different ways from vases, cups, bowls, plates, or other articles most conveniently formed upon the potter's wheel.

Tile have a rich, historical background, are highly useful in a variety of decorative applications, can readily be produced upon a small scale, and are susceptible to the whole range of decorative ceramic treatment.

While in Florida recently, the speaker noted particularly the extensive and effective use of decorative tile, most of which were of Spanish origin but with some representation of American tile. In the cloistered courts and patios of the Boca Raton Club at Boca Raton, enameled tile are used effectively for walks, garden edgings, benches, fountain basins and stands, step-risers, and decorative panels in gateway columns. At the John L. Ringling Hotel in Sarasota, one observes immediately the tiled wainscotings, borders, stair-risers, and panels. In the homes at Mountain Lake, one is impressed with the effective use of tile, often in unique ways, such as for baseboards and for lining sideboard niches or recesses. Tile are also used in many of these beautiful homes for fireplace facings and hearths, wainscotings, stair-risers, borders, inserts or panels in cement walls, table tops, and of course in the patios and gardens for many purposes. Upon speaking admiringly of a fireplace faced with large Spanish tile, the speaker was informed by the owner that only one tile was original, the others being copies made by an American woman in her ceramic studio-shop. The copies could not be distinguished from the original, except perhaps by close study upon the part of an expert. At Mountain Lake, richly colored faience tile made by H. Dulles Allen are used effectively for the grilles of the Bok Tower.

Tile may carry a design either cut in (incised) or built up, they may be plain, enameled, or glazed, they may

carry underglaze or overglaze decoration, and they may be large or small and made in a variety of shapes other than square, such as diamond-shaped, octagonal, etc. Large, blue enameled, diamond-shaped tile are used effectively for the bathroom floors of the Boca Raton Club.

In the speaker's opinion, the manufacturers of ornamental tile are too modest in promoting the possibilities of their product. "Pottery teachers" and designer-craftsmen likewise apparently are not giving the attention deserved by this outstanding ceramic product which can be made in a small way even more readily than products of the potter's wheel and for which the uses are probably more varied and permanent.

*Terra cotta*, or *ceramic sculpture*, in some ways not as adaptable to classroom or studio treatment as pottery and tile, has important advantages over other branches of ceramic art.

Clay modeling requires nothing more than the hands and a few simple hand tools. It is the simplest and most fundamental form of ceramic art, or of any art, because it involves no other technique than the eyes, hands, and judgment of the worker. There is nothing else to manipulate, such as wheels, molds, or cutters.

In addition to affording a means of self-expression in form and color, as in pottery and tile, clay sculpture also provides the opportunity of molding the human figure and animals. It thus enters a field in which expression can be given to ideas and to the emotions, such as music, devotion, sorrow, gaiety, and sympathy, or to such types of people as an old man, dancing girl, wrestler, and hunter, or to difference in races as Chinese, Indian, and African. In animals, action, cunning, ferocity, and gentleness may be expressed.

As a matter of fact, clay modeling or ceramic sculpture has formed the principal part of the work in the Haaren High School of New York where Mrs. Brady has so successfully demonstrated the value of ceramics as an educational project.

Ceramic sculpture is quite adaptable to studio treatment as manifested by many artists from very early times.

The figures for the fountain in the grounds of the Roosevelt Hospital, New Brunswick, New Jersey, designed and executed by Waylande Gregory, and the massive terra-cotta statue of Christ, placed 9000 feet high in the mountains overlooking Santa Maria del Monte, Colorado, designed by the T. H. Buell Company and executed by the Denver Terra Cotta Company of Denver, are but two examples of creative art and individual production in terra cotta.

The principles involved in terra-cotta production are identical with those of clay modeling learned in the classroom.

*Vitreous enameling* of metallic surfaces is one of the oldest branches of the ceramic art, enameled objects having been found among the oldest of Egyptian relics. Contemporary craftsmen of many European countries, especially France, Germany, and England, include this medium in the practice of modern decorative art. It is well adapted to school and studio production and to the work of professional designer-craftsmen.

TABLE I  
CLASSIFICATION OF CERAMIC PRODUCTS

| Ware  | Construction material  | Home furnishings  | Industrial equipment   | Public utility products  | Miscellaneous   |
|---|--|---|--|--|---|
| Pottery<br>(porcelain, stoneware, china, earthenware, etc.) | Bathroom equipment (bathtubs, wash bowls, closets, fixtures)                 | Cookingware (baking dishes, casseroles, etc.)<br>Kitchenware (other than for cooking—crockets, bowls, etc.)                           | Acidproof stoneware for manufacture of chemicals   | Insulators for high-tension transmission<br>Street-lighting fixtures | Garden pottery<br>Dental porcelain (dentures, crowns, fillings) |
|   | Laundry tubs<br>Electrical wiring devices<br>Doorknobs<br>Drinking fountains | Tableware<br>Art and novelty ware (vases, jars, boxes, bookends, statuettes, figures, trays, jardinières, lamp bases, tea sets, etc.) | Chemical laboratory porcelain<br>Porcelain parts for textile machinery<br>Linings and balls for grinding mills<br>Spark plugs<br>Radio equipment | Telephone and telegraph insulators                                   |   |
| Tile<br>(plain, mosaic, faience, etc.)                      | Floor tile   | Framed medallions   | Linings for coal bunkers, acid tanks, ice boxes  | Swimming pools<br>Public baths                                       | Garden and cloister adornments:                                 |
|   | Wall tile  | Table tops  | Dairy floors   | School corridors and wainscotings                                    | benches, edgers, walks, fountains, pools                        |
|   | Roofing tile   | Hot-plate stands  | Air-conditioning units   | Street and traffic signs   | Bell-tower grilles  |
|   | Fireplace tile (facings and hearths)   | Bookends  | Grills for electric heaters  | House numbers  |   |
|   | Store fronts   |   | Switch plates  | Nonslip stairs and ramps   |   |
|   | Vaulted ceilings   |   |  | Subway and tunnel linings  |   |
|   | Bath- and sun-room tile  |   |  |  |   |
|   | Stair-treads and risers  |   |  |  |   |
|   | Wainscotings   |   |  |  |   |
|   | Grilles  |   |  |  |   |
| Baseboards  |  |   |  |  |   |
| Built-in medallions   |  |   |  |  |   |
| Terra cotta   | Exterior building walls and decoration                                       | Figures<br>Bookends<br>Ornaments  |  |  | Garden pottery (urns, sundials, etc.)                           |
|   | Interior walls and decoration  | Doorstops<br>Lamp bases   |  |  | Memorials and commemorative monuments                           |
|   | Statues  |   |  |  |   |
|   | Fountains  |   |  |  |   |
| Brick and other heavy clay products                         | Walls  | Fireplace fronts  | Acid-proof brick   | Street and road paving   | Farm drain tile, silo tile, septic tanks                        |
|   | Enameled brick facings   |   |  | Wire and cable conduits  |   |
|   | Salt-glazed brick  |   |  | Sewer pipe   |   |
|   | Structural hollow tile   |   |  |  |   |
|   | Chimney tops<br>Copings  |   |  |  |   |
| Glass   | Building block   | Cookingware   | Automobile windshields   | Street-lighting globes and fixtures                                  | Glass eyes<br>Eyeglasses  |
|   | Windows  | Kitchenware   | Chemical glassware   | Road traffic signals   | Optical glass   |
|   | Skylights  | Tableware   | Insulators   | Railroad signals   | Fibrous glass products  |
|   | Outdoor flooring   | Mirrors   | Bottles  |  |   |
|   | Bathroom fixtures  | Table tops  | Battery jars   |  |   |
|   | Doorknobs  | Art and novelty ware  | Lamp bulbs   |  |   |
|   | Stained-glass windows  |   | Radio and X-ray tubes  |  |   |

Classification of Ceramic Products (<continued)

| Ware                           | Construction material          | Home furnishings            | Industrial equipment  | Public utility products             | Miscellaneous                      |
|--------------------------------|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|
| Vitreous enamels               | Exterior wall facings          | Cookingware                 | Finish for refrigerators, stoves, washing - machines, scales, etc.  | Street signs and traffic semaphores | Jewelry                            |
|                                | Roofing tile                   | Kitchenware                 |   |                                     | Illuminated signs                  |
|                                | Bathroom and kitchen equipment | Tableware                   |   | Street-lighting reflectors          | Signs and numbers for all purposes |
|                                | Art ornaments and novelties    |                             |   | Advertising signs                   |                                    |
|                                | Interior panels                | Art ornaments and novelties |   |                                     |                                    |
|                                | Fireplace facings              | Mosaics                     | Store fixtures  |                                     |                                    |
|                                | Mural decoration               | Panels                      | Linings for tanks and processing units  |                                     |                                    |
| Refractories (firebrick, etc.) | Flue linings                   | Domestic stove and furnace  | Boiler linings  |                                     | Crematories                        |
|                                | Fireplaces                     |                             | Furnace linings   |                                     |                                    |
|                                | Fire walls                     | parts                       | Kilns; glass pots; crucibles; electric furnace insulation ; arc-resistant insulation; pyrometer accessories |                                     |                                    |
|                                | Incinerators                   |                             |   |                                     |                                    |

A wealth of color and design is available to the worker in vitreous enamels whether the objective is a bit of jewelry or an extensive mural decoration.

H. Edward Winter of Cleveland, Ohio, who has been successful in designing and executing vitreous enameled murals and in using this subject as an educational project, believes that enameling offers an unusually interesting and stimulating subject for inclusion in the artwork of any educational system. Speaking before the Art Division of this Society at Baltimore in October, 1936, he stated:

In designing with the enamel, new techniques prove that to enamel a plate or an object successfully with various colors one does not need to employ the cloisonne wires or champleve cell techniques, as was once believed necessary to keep the enamels from running into one another. An intricate design pattern may be executed in enamel with the graffiti technique, a scratching away process which produces interesting effects with the ease of any graphic medium. This technique, more than any other, will allow students free reign with their spontaneous creative ideas. They may draw in enamel as they would on paper with pencil or charcoal. Designs, both realistic and abstract, portrait and caricature drawings, may be done with this medium, and when the work has been finished by firing, a permanent object of beauty is the result.

Visitors to the New York World's Fair this year may see a hundred or more vitreous enameled murals designed and executed by J. Scott Williams, Daniel Boza, Russell B. Aitken, and other artists. Among these is the largest mural ever produced with vitreous enamels (28 feet high by 72 feet long).

Glassmaking, in general, is not so readily adaptable to laboratory or studio production because of its more difficult technique and the special skill required before the worker can readily execute his original designs.

Upon the other hand, glass offers an unusually excellent medium for individual expression in design, color, and decoration. Seemingly more individual artists and craftsmen participating in the production of the leading glassmaking establishments of the world are known to the lovers of fine glass than the artists in

other ceramic fields are to their buying public. In fact, it has been this individuality in conception and execution that has been largely responsible for the fame of such glassware as Murano, Lobmeyr, Lalique, Orrefors, Leerdam, Steuben, and others.

Glass may be shaped not only by molding and blowing into forms practically without limit, but it may be decorated in many ways of which some are unique. The body of the glass itself may be colored throughout or made with colored laminations or surface coloring applied in the forms of enamels. Various decorative designs may be applied to the surface by cutting, tool-engraving, acid-etching, sandblasting, stippling, and other methods. The effect of transmitted, reflected, or refracted light upon decorated glass offers an entirely unique field of possibilities, especially in securing delicate and changeable color effects not possible with opaque ceramic ware.

The field of glass, therefore, should prove to be of great attraction to all interested in ceramic activities and particularly to prospective designer-craftsmen.

The designing and production of stained-glass windows, panels, and medallions is not only an attractive field for craftsmen but has been used successfully in educational projects, as in the Connick Studios and in Y.W.C.A. and Y.M.C.A. classes in Boston. Although the field for stained glass is relatively not large, there is no branch of ceramic art that requires a greater degree of originality and skill. No two stained glass windows are alike and the designer-craftsman is always confronted with new problems and fresh interests. Designs must harmonize with architectural schemes, ideas must be expressed by skillful symbolism, and the artist must know something of the effect of transmitted light upon color and of colors upon light.

This is an activity which can not be as completely spoiled by industrial production as have some of the other branches of ceramic art, such as Chinese porcelains. The originator of a beautiful stained glass window, furthermore, is far more assured of his work

remaining to please future generations than are the creators of more portable ceramic products.

These remarks are sufficient to indicate that there is something to be said to the prospective worker or student in ceramics as to the comparative possibilities of different branches of the art from the standpoint of individual design and craftsmanship.

Not all ceramic products are susceptible of artistic treatment—one would not expect to do much with a refractory product—but most of them will be found well worth consideration.

### III

It is evident that the creation of some types of ceramic products is not dependent upon the inherent plasticity of clays. Glazed Egyptian tile from a palace of Rameses II at Kantir contain as high as 93% of silica, indicating the use of a high percentage of nonplastic ingredients and fabrication by some other means than plastic molding.

The plasticity or workability of other ceramic products is achieved by heat, as in glass and enamels.

The ceramic arts, therefore, need not be considered as comprising plastic materials only.

Inasmuch as the producers of articles made from modern synthetic resins have appropriated the term "plastics" to indicate their field (although using normally nonplastic materials), it is more necessary today to understand that the ceramic arts are not confined to the manipulation of plastic clays nor are many so-called plastics products of a ceramic nature.

### IV

"I would rather be able to appreciate things I can not have than to have things I am not able to appreciate."

—*Elbert Hubbard*

A desire for the ability to distinguish the good from the mediocre in ceramic ware may be stimulated by reference to outstanding products, supplemented by visits to museums, art galleries, and important private collections. Reliably illustrated books and catalogues may be used to advantage, but actual specimens are preferable.

An interest in ceramics generally will be sharpened and broadened by a background knowledge of the ceramic ware with which everyone is surrounded but which few really observe.

How many guests at a formal dinner know whether the chinaware placed upon the table is porcelain or bone china, whether it is Copenhagen, Wedgwood, Lenox, or of some other celebrated factory? Are those amusing colored glass table decorations Murano? Those crystal-clear water and wine glasses may be Steuben or Orrefors. Should one be careful of the translucent, shell-like ash trays (which may be Royal Worcester) or are they something "from the Five and Ten" for the careless cigarette smoker?

Perhaps some of the ladies may discern these things, but to most of the men they are probably "just the dishes and ornaments."

What about the gleaming tile of interesting design

which form the facing and hearth of the fireplace in the living room? Are they Dutch or Spanish, faience or pressed?

It is inadvisable to become so curious about the tableware of a hostess as to turn the plates over to see whether or not a judgment is correct as to the type and origin, but an interest in these things set out for a guest's pleasure will always be repaid.

Charles Dickens records one occasion upon which he took special note of the chinaware and glassware set before him. The following opening paragraphs are quoted from his article, "A Plated Article," published in *Household Words* in 1852:

Putting up for the night in one of the chiefest towns of Staffordshire, I find it to be by no means a lively town.

I have paced the streets and stared at the houses and am come back to the blank bow window of the Dodo; and the town clocks strike seven. I have my dinner and the waiter clears the table, leaves me by the fire with my pint decanter, and a little thin funnel-shaped wine-glass and a plate of pale biscuits—in themselves engendering desperation.

No book, no newspaper!

What am I to do? To burn the biscuits will be but a fleeting joy; still, it is a temporary relief, and here they go on the fire! Shall I break the plate? First, let me look at the back and see who made it: Spode.

Spode! Stop a moment. Was it yesterday I visited the Spode Works and saw them making plates? In the confusion of travelling about, it might be yesterday or it might be yesterday month; but I think it was yesterday. I appeal to the plate. The plate says, decidedly, yesterday.

Then follows a delightfully fanciful account by the plate itself of the method of its production at the famous Spode factory in the smoky but picturesque town of Stoke.

Charles Lamb, in beginning his charming bit of reminiscence, "Old China," writes:

I have an almost feminine partiality for old china..... I can call to mind the first play and the first exhibition that I was taken to; but I am not conscious of a time when china jars and saucers were introduced into my imagination.

Watching a potter at his wheel inspired Longfellow to the flight of fancy of "Keramos" in which is indicated his broad knowledge of famous potters and their ware. It is interesting to note in his poem that the potter's art is not restricted to "pots" but ranges from "bracelets with blue enamelled links" of the Egyptians to "the fragile forms of clay" created by Lucca della Robbia and "made perfect by the furnace heat."

Porcelain was included among the gifts presented to Saladin by Richard III during the Crusades, as recounted in "The Talisman" of Sir Walter Scott. It was considered one of the choicest gifts that could be made as it may well be today if selected with discrimination.

So one may continue and quote from those who have recorded their interest in ceramic objects about them.

Once the interest in present-day ceramics has been aroused, there will naturally follow an interest in historic ware. Such an interest will lead one to exhibits and to references and thus form an added objective in traveling which will certainly increase the pleasure thereof.

It is a tiresome business when traveling to "do" museums and galleries largely for the sake of being able

to tell of doing so, but the ceramist, be he student, craftsman, collector, or connoisseur will do well to weave a thread of ceramic objectives through his travel plans.

Certainly anyone in New York City will be thrilled with the old Chinese porcelains in the Metropolitan Museum of Art and impressed with the Hispano-Moresque pottery in the museum of The Hispanic Society of America. While in New York, with a day to spare, also run down to Trenton and see the show-room display of that outstanding American china—Lenox. It is a product in which the American ceramist should take great pride.

When in London be sure to see the wonderful collections of Chinese porcelains and Italian majolica in the Victoria and Albert Museum as well as the Chinese porcelains in the British Museum.

Some bright, sunshiny morning in Paris walk over to Saint Chappelle about eleven o'clock and see its lovely stained-glass windows at their best and then go out to Chartres in the afternoon and there drink in the beauties of the stained glass enhanced by the rays of the afternoon sun.

Anyone visiting Germany who fails to visit the Near East Section of the State Museum in Berlin and the section of the Processional Street of Nebuchadnezzar II, transported from ancient Babylon and reset as upon its original site, has certainly missed a ceramic treat. Its walls and gateways of blue enameled brick are decorated above and below with colored rosettes and with alternate reliefs of bulls and dragons in yellow and white enamel, a most striking and beautiful piece of work using enameled brick with relief ornamentation.

This is not only an outstanding work of ceramic art but it stirs the imagination with respect to the antiquity of an art already highly developed five or six centuries before Christ.

While in this Berlin State Museum also see its collection of Greek vases—an unusually good exhibit.

From Dresden, it is but a short motor trip to Meissen, where have been preserved specimens of Dresden porcelain from the polished redware of Bottger, made just before his discovery of materials with which to duplicate the wonderful white translucent porcelain that the Chinese had been making approximately eight hundred years before his time. Dresden porcelain has held its place among the world's best ware.

A sojourn in Florence provides the opportunity to visit the unusual private museum of Societa Ceramica Richard-Ginori at nearby Doccia—a condensed history of the development of modern Italian ceramics.

In this field of interest, items might be added indefinitely.

## V

Now, if one has established a background of interest in things ceramic, he is likely to explore the greatest and most interesting field of all, the origin and historical development of the ceramic arts, veritably the history of the human race, for much of our knowledge concerning prehistoric peoples has been gotten through the inscriptions and various subjects depicted upon tablets, brick, tile, vases, and other forms of fired clay.

(1939)

As Goldman stated in a paper presented before this Society<sup>1</sup> in 1934,

For the civilization of classical Greece, pottery is but one and a minor source of evidence, but as soon as we try to deal with the periods preceding the time of great buildings and of written records, pottery is always of major importance and often through its stratified layers in the earth our only means of defining successive cultural phases. "By their works shall ye know them" has a very special and a very literal meaning for the prehistorian.

E. A. Speiser, Professor of Oriental Studies in the Graduate School at the University of Pennsylvania, was quoted as follows in the Paris edition of the *New York Herald-Tribune* of April 15, 1937:

Because we have no trace of languages further back than 3000 B.C., we knew practically nothing about this people. To our astonishment, we found they were the builders of remarkable modern architecture. Magnificent temples, built in clay, decorated in red brick, were unearthed. The style, believe it or not, was "Renaissance." And, mind you, people were thought incapable of building anything in those times.

Dr. Speiser further states in a recent personal communication,

The most probable date for the beginnings of pottery is the sixth millennium B.C. My own excavations at Tepe Gawra have helped in carrying back our knowledge of the earliest settlements in Mesopotamia to about 5000 B.C. This is the absolute bottom of that part of the world (that is, in central Mesopotamia; southern Mesopotamia is approximately one thousand years later). But even Neolithic occupations known to us were not of local origin. They had been imported from elsewhere. The knowledge of pottery had come in with that importation. Its source remains to be determined. But internal indications make it extremely likely that those elusive beginnings were not many centuries older.

While the most beautiful pottery of antiquity is that from earliest Susa (in southwestern Persia, about 3000 B.C.), the most perfect technically belongs to the so-called Halaf period (represented in several sites, including Tepe Gawra; date about 4000 B.C.).

Jotham Johnson, formerly of University Museum, Philadelphia, speaks in a lighter vein<sup>2</sup> of a neolithic villager having discovered the usefulness of clay in cooking utensils "about nine thousand years ago." In a recent personal communication he states,

The manufacture of pottery begins in the neolithic ("new stone") period, and it is in fact far more typical of the archaeology of that period than the improved technique of stone-working for which the period is named. It has been suggested that the term "ceramic" period be substituted and I am in favor of this.

Very primitive pottery from the neolithic or "ceramic" period has been found widely in Egypt, western Asia, China, and southeastern Europe. The laboratory comparison of these local fabrics has lagged far behind their discovery, and it may be a decade or a generation before anyone can authoritatively state which is the oldest. It is highly probable that the discovery of the process was made independently in several different centres of culture diffusion at different times. In that case we will have no way of deciding between their rival claims.

As for a date: since these primitive wares go far back of the invention of writing, it will not be possible to set an absolute date for the earliest. The earliest date in history is probably 3251 B.C. and nothing older will be found. The earliest pottery types have been referred to about 5500

<sup>1</sup> Hetty Goldman, "The Bronze Age Pottery of Greece," *Bull. Amer. Ceram. Soc.*, 13 [11] 301-308 (1934).

<sup>2</sup> Jotham Johnson, *Scientific American*, December, 1936.

B.C. Assuming that more ancient fabrics still await discovery, conservative investigators date the hypothetical origin about 6000, others back to 7000 or 8000. I favor a very conservative date between 6000 and 5500 B.C., but that is only my opinion.

Delougaz<sup>3</sup> describes ceramic objects found during exploration in Mesopotamia as "dating from the Early Dynastic period at the end of the fourth and beginning of the third millenium B.C."

Just when and where the first articles of clay were made will never be known. One may be as fanciful with respect to the origin of pottery as Charles Lamb concerning the origin of roast pig and probably be much nearer the truth.

Through the kindness of Charles H. Harder of the New York State College of Ceramics, Table II is given to show, in a general way, the historical progress of ceramic production. This is given as a suggestion for presenting a historical background in a very much condensed form. With further suggestions from others, such a tabulation might be shaped into a useful general reference or basis for a more detailed study of the pottery of any particular nation or of some definite type.

According to N. C. Debevoise of the Oriental Institute, University of Chicago, and other archaeologists, the chronological records of ancient culture, including ceramics, are practically complete so that an account of the historical development of ceramic ware may now be given with a fair degree of continuity.

A study of ancient ceramic products will stimulate interest not only in forms of ceramic art but in history, archaeology, geology, and other subjects. As an aid to conceptions of form and color for specific purposes, the study of old ceramic ware is invaluable. There is today nothing more graceful than the Greek vase; nothing as highly and as harmoniously colored as Ming porcelains; and nothing to compare with the soft beauty of Persian or Spanish luster tile. One can even obtain constructive ideas from a study of redware decorated by Zuni Indian squaws.

## VI

In leading one along the paths of creative ceramics, a historical sequence is most logical and almost automatically carries with it collateral interests so desirable to develop.

For instance, the first steps in clayworking or forming should involve nothing but the hands and a lump of soft clay. This reproduces the conditions under which the first pottery was made by primitive man. Some simple form is made, probably dish-shaped or bowl-shaped. As Dr. Goldman,<sup>1</sup> in speaking of early Greek pottery, states, "The early type of bowl is so simple and so adapted to the hand which fashioned and held it that it may well be thought of as an extension of the human hand itself."

The method of shaping which is simplest, most engaging, and most adaptable to self-expression is that of hand-forming or sculpture.

From this beginning, the worker may proceed along the historical path of clay-forming methods, such as

<sup>3</sup> P. Delougaz, *The Illustrated London News*, December 3, 1938.

coiling, molding, throwing (introducing the potter's wheel—centuries after hand-fashioned neolithic pottery), turning, casting, and machine molding.

The important possibilities of clay will be learned at the outset, and as the work proceeds through the various methods used for forming, a realization will develop as to the greater suitability of each method over others for specific design classifications.

## VII

Decoration likewise may most advantageously be studied by following its historical sequence.

After the discovery that plastic clay could be shaped into useful articles, the decoration of such articles naturally followed; this decoration at first consisted of a simple finish secured by polishing, but it gradually developed through a great variety of elaborate and highly colored ornamental designs.

As with forming, the development of skill, good taste, and ambition in decorating will be helped by reference to classical examples of the past.

The earliest potters probably first resorted to scratched or incised designs of great simplicity. This no doubt was followed quickly by attaching pieces to form raised designs or useful components, such as handles and legs.

With an abundance of common clays of which some were red and others gray or buff, slip coating was begun at a very early period. This permitted cutting designs through a slip coat, thus originating the polychromatic decoration of simple clay ware, which later was applied in principle to all other branches of the art, as shown today in the application of this method to the production of decorative paneling of vitreous enameled metals.

The technical ceramist ordinarily speaks of a glaze as a glass, rather suggesting the prior discovery of glass and its later adaptation to the glazing of ceramic ware. Among Egyptian antiquities, however, there is evidence of glazed stones and frits or siliceous tile, such as those of Kantir previously mentioned, which date back as far as 5000 to 4000 B.C., whereas glass does not commonly appear before approximately 1500 B.C.<sup>4</sup>

In Egypt, glazing was not used upon pottery or argillaceous ceramic ware until Ptolemaic times, some 4000 years after glazing had been applied to non-argillaceous or siliceous ceramic products. In Mesopotamia, however, glaze was used on pottery as early as 1500 B.C.

The discovery that ceramic ware could be glazed led to a greatly expanded field of decorative possibilities. At first, simple alkaline glazes were used in limited colors, chiefly blue, but the opportunities for extension soon became apparent.

If the chronological development of ceramic decoration were tabulated, it would probably follow the order suggested in Table III.

The order in which ceramic decoration has progressed since its beginning is suggested as the most natural and most effective sequence for teaching the art today.

<sup>4</sup> N. C. Debevoise, "The History of Glaze and Its Place in the Ceramic Technique of ancient Seleucia on the Tigris," *Bull. Amer. Ceram. Soc.*, **13** [11] 293-300 (1934).



TABLE III  
CHRONOLOGICAL DEVELOPMENT OF CERAMIC DECORATION

|  |
|--|
| Polishing  |
| Incising   |
| Impressing or stamping   |
| Glazing of nonargillaceous ware  |
| Painting   |
| Relief   |
| Slip coating   |
| Graffito (cutting through slip coating to produce design<br>in the color of the underlying ware) |
| Glazing of all types of ceramic ware   |
| Clear glazes    \ With under glaze and   |
| Colored glazes / overglaze designs   |
| Enameling  |
| Designs over enamel  |
| Luster ware  |
| Salt glazing (the first of vapor glazes)   |
| Specialty glazes   |
| Crackled   |
| Crystalline  |
| Cloisonne and champleve (in tile and vitreous enamels)   |
| Metallic banding   |

### VIII

"Art is not a thing separate and apart. Art is simply the best way of doing things."

—*Elbert Hubbard*

With some knowledge of the ways in which clays and allied materials may be shaped and decorated and of the field of usefulness of the finished articles, the young worker is ready for original design and execution.

In designing and in the selection of materials, there should be a definite purpose and, of course, the highest possible degree of suitability in shape and material for the use which is to be made of the article, *i.e.*, high functional value.

Recently at an afternoon tea the speaker was handed a square cup and saucer of foreign production. The tea readily ran from the corners of the cup upon one's collar if great care was not exercised, the cup handle was a square, cross-barred affair through which a finger could not fit but could only be squeezed tightly between the thumb and finger for holding, and the cup would not stay centered upon the square saucer. In addition to being a liability to the user, this unique affair was probably as great a trial to the maid whose duty it was to restore cleanliness to the tea service.

Upon another occasion, there appeared a water pitcher glazed in imitation of wood, with grain, knots, "and everything." Why should a ceramic product be made to look like a wooden article, especially for holding water?

In designing, one should make pitchers that pour easily, coffee pots from which the tops do not fall off and splash into one's cup just as it is filled, teacups that may be held firmly and gracefully, table and kitchen articles that may be cleaned readily and thoroughly, and in all cases articles that serve their purpose well.

Choice and arrangement of colored decoration is an important part of designing. In these days of color consciousness and color experts, designer-craftsmen will find it advisable to use pleasing and suitable colors and may readily secure professional advice in color selection for special applications.

In the speaker's opinion, the predominance of red in salad plate decoration would detract from the desired

(1939)



Fig. 1.—Athenian girl weaving. Lekythos vase, about 500 B.C. (British Museum, London).

effect of refreshing coolness and daintiness. If green is selected as the predominating color, a great difference in greens will be found, the light shades having a fresh, clean look and the very dark shades, a cheap, unhealthful look.

Pansies used as under glaze decoration for a meat platter do not help very much—to be extreme in statement. If the meat being served were beef, the hostess might be suspected of carrying unnecessarily far the weakness of Ferdinand the Bull.

Multicolored majolica used for luncheon in the open air along the shores of Lake Como upon a bright sunny day in May harmonizes beautifully with the reflected colors of the flower gardens along the water's edge and gives one a sense of serenity and satisfaction. The same ware used for a formal dinner at the Savoy in London would have an entirely different effect.

Howard Ketcham concludes an article in *Harper's Bazaar* of February, 1937, as follows:

The world of color is large, complex, and unexplored, but at the same time, familiar and intricate. For, as Grant Allen pointed out in his essay on comparative psychology, "There is no element in our sensuous nature which yields us greater or more varied pleasure than the perception of color. The pleasure of color is one which raises itself above the common level of monopolistic gratification and attains to the higher plane of aesthetic delight."

Thus an understanding of color forms an essential part of our general culture.

Likewise Franklin Brill has this to say in an article appearing in *Modern Plastics* for October, 1938:

As any designer instinctively knows, color has the property of conveying emotional reactions to the observer. Thus, reds, oranges, and variations of these colors convey a feeling of warmth; blues and greens are cool. (Laundries and bakeries have repeatedly reduced complaints of heat by painting walls in light ice-blues; and it is an old rule of the theatre never to play a comedy scene under anything but yellow light.) In fact, various colors can make a product look larger, smaller, heavier, or lighter; rich, soothing, expensive, hot, cool, clean, strong, or stimulating. Such color reactions should be studied before approaching any color selection job, for while they are by no means infallible they cannot be ignored without leading to the selection of colors which are unsuited to a product's function. These connotations are listed below.

Here is what colors mean in the opinion of some color authorities. But individuals, market peculiarities, competition, or other associations can sometimes knock any one of them into a cocked hat, as can the use of certain shades, tints, or modifications of each color.

*Red:* Fire, heat, excitement, strength  
*Rose:* Daintiness, softness, fragrance, freshness  
*Orange:* Warmth, action, power, tastiness  
*Maroon:* Richness, solidity, luxury, quietness  
*Yellow:* Brightness, airiness, refreshment  
*Dark blue:* Coldness, formality, haughtiness  
*Light blue:* Coolness, fragility, daintiness, youthfulness  
*Dark green:* Unhealthfulness, cheapness, coldness  
*Light green:* Freshness, crispness, coolness  
*Purple:* Royalty, stateliness, opulence  
*Lavender:* Fragrance, richness, refinement  
*Brown:* Wholesome and mellowness; utility  
*Gray:* Mildness, softness, reserve, primness  
*White:* Purity, professionalism, cleanliness, chastity  
*Black:* Strength, mystery, heaviness, coldness

The designer must give some consideration to the body material used in articles for specific uses. Mexican water jars made of a vitrified or nonporous material would prove entirely useless in comparison with the highly porous pottery purposely used to provide slow leakage, surface evaporation, and a resultant maintenance of coolness. When using clay compositions, porous structures are usually best for heat resistance.

Objects to be used outdoors should be weather-resistant and therefore impervious. Obviously floor or porch tile should be tough and abrasion-resistant. Articles with a purely ornamental purpose may cover a wide range of physical properties but should be suited to carry the scheme of decoration proposed.

Purpose in designing is always essential but need not be a single purpose. Ware may be made to satisfy

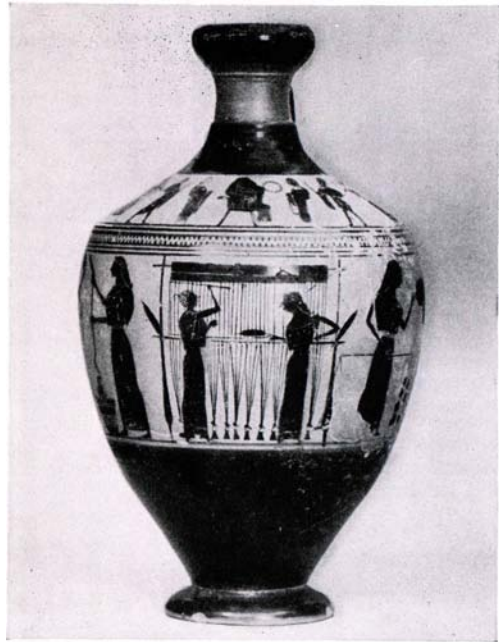


Fig. 2.—Greek women weaving and spinning, on a black-figure vase, 6th Century B.C. The weights attached to the bundles of warp-threads are plainly seen (Metropolitan Museum of Art, New York).

simultaneously definitely useful functions, please the eye, withstand hard usage, and even provide enduring records of current life and events.

When the Assyrians and Babylonians wrote on clay, they permanently recorded the life of the times in the very best way.<sup>5</sup>

<sup>5</sup> Edward Chiera, *They Wrote on Clay*. G. G. Cameron, Editor, University of Chicago Press, Chicago, 111., September, 1938.



Fig. 3.—Penelope and Telemachos before a high-warp loom, showing an unfinished tapestry; so-called Penelope vase from Chiusi, dated about 400 B.C. Red figures on black ground.

As a simple instance of recording another industry or art by means of the ceramic art, the accompanying illustrations, which appeared in *Ciba Review*, No. 16, December, 1938, are reproduced here through the courtesy of the Society of Chemical Industry in Basle, Switzerland, and Ciba Company, Inc., of New York.

This recording of persons, processes, and events has not been confined to the ancients but has been practiced in quite modern times. In an article entitled "Railway History in Pottery," John Phillimore<sup>6</sup> describes English pottery made in the forms of mugs, jugs, and bowls of varying shapes and sizes decorated with scenes of the early railway equipment during the years when railways were the wonder of the world, that is, the early part of the nineteenth century. Various early types of engines and cars are shown as used over a period of fifteen or twenty years when railway equipment was changing rapidly. It is the speaker's impression that the New York Central and Pennsylvania Railroads (or the Pullman Company) have done something along this line in getting out commemorative plates with railway scenes for dining-car service, these being mostly in blue and white or brown and white.

"The art preservative of all arts" surely may be applied to ceramics with full justification.

Symbolism may also form part of the designer's objective as well as direct portrayal.

This, of course, is especially predominant in the decorations of crude Indian pottery, and also in the decoration of classical Chinese porcelain—the aristocrat of all ceramic ware—every detail has its significance. An understanding of these symbolisms adds substantially to an appreciation of the ware.

## IX

It is hardly probable that a worker in ceramic materials can proceed far without evincing some interest in the occurrence and properties of the raw materials which he uses.

Why are some clays red after firing and others buff, gray, and white?

Why is a white-firing clay usually much less plastic and more refractory than a very dark-colored clay?

Where are workable clays most likely to be found?

Metallic oxides each produce some characteristic color in glazes, but with a certain few oxides a range of widely different colors may be produced. With only copper oxide, how did the Chinese potters secure such beautiful red as their "sang-de-boeuf" or the delicate shade of their famous "peach bloom," as well as a variety of colors ranging from blue to green?

How are crystalline glazes formed?

Correct answers to such questions carry one into the realms of geology, mineralogy, chemistry, and physics.

<sup>6</sup> *The Connoisseur*, May, 1938.

<sup>7</sup> A. L. Hetherington, *Chinese Ceramic Glazes*. Cambridge University Press, 1937.

## X

There is certainly much to be told concerning ceramics as an art or to supplement its presentation as a cultural subject.

Orton's work provided a better educational and inspirational background for the engineering and industrial phases of ceramics. There is a great opportunity and need today for a broader educational and inspirational background in the art phase of ceramics which Orton made no attempt to cover.

Ceramics is a great art, an art of which the members of this Society may well be proud. Extending back beyond the dawn of history, it has been practiced by all branches of the human race and its products have been used for the service and pleasure of mankind in innumerable ways. Pottery-making has a fascination for old and young, and the simplest creation of the fingers may be at once pleasing in appearance and of practical usefulness.

In the speaker's opinion, the ceramic art would benefit in direct practice, utilization, appreciation, and in serving better as an educational subject if there were better coordination and dissemination of information concerning it.

In any scheme of coordination, there should be a major center in which information is collected, edited, and distributed, in which outstanding exhibits both of ancient and modern classical ware are available (as in museums, galleries, and private collections), in which well-qualified teachers for the practice of each branch of ceramic art are procurable, and in which there are opportunities for reaching a large number of people by exhibits, lectures, and sales of the products of designer-craftsmen. It should be a place also where the product of beginners may be fired or where they may obtain small supplies of necessary raw materials. Many lesser features could well be included.

A great interest is shown by present-day educators in ceramic art, as manifested by the large and increasing number of classes. Its unique and readily developed educational values are generally recognized. The ease with which some branches of the art may be initially practiced provides an early indication of pupil ability in originality, concentration, and coordination. The great variety, wide distribution, and universal usefulness of ceramic products quite probably exceed that of any other art or craft. There is a wealth of historic and romantic interest in every branch of ceramics. Ceramics, which involves drawing, painting, and sculpture to a greater extent than these arts involve ceramics, is therefore more comprehensive.

For these reasons, those of us directly interested in ceramics should, upon all appropriate occasions, point out its unique and interesting features as an art, an educational project, and as a source of innumerable, decorative, and widely useful products. In time, this will result in a more general recognition of ceramics as perhaps not the least of the major arts.

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