

MANAGING CERAMIC CROCKERY FOR BETTER EFFICACY

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Abstract

Pottery crockery are table items for serving meals. They include wares intended for use in ovens, designed to resist cracks that could result from the shock of being placed in or of being taken out of hot ovens to cool quickly at room temperature, stating such advantages of ceramic crockery pottery over other forms of vessels as being serviceable for use in cooking in the oven, inexpensive, heat retaining especially keeping food warm for a long time. However, these pottery wares according to the article do develop cracks either due to improper handling or after several uses and when this happens; there is need for utmost caution particularly when these cracks become noticeable. It hereby advocates ways in which leach and crazed crockery wares including other ceramics can be identified, managed, and deciphering some of the problems associated with improper handling of Crockery so as to avoid complexities in our homes.

Introduction

Ceramics are common articles of glass and pottery found in our homes. They are mainly clay products that had undergone heat treatment ranging from sanitary wares meant for wash up and hygienic purposes, to the wall and floor tiles, the water closet and wash hand basins that adores our toilets and bathrooms to the cements and bricks used in the houses we live. The crockery or table wares which are container items are employed while serving our meals, example is the casserole which Hamer, (1975) opines as a lidded, oven-cooking dish for meat and vegetable stews. It is intended as oven-to-table ware, that is, for cooking in and serving from the oven. Other form of crockery includes the Tea set which consists of a teapot usually with a lid of compact shape, a medium sized spout and handle for infusing and serving tea." Rado, (1969) in defining pottery, states that "they are domestic ceramic ware like tableware, kitchenware and sanitaryware, others are art wares, which are figurines, fancies and ornamental pieces" the flower vases and figurines for decorating our interiors therefore complement the crockery.

These Figurines that complement the crockery according to Primmer, (1974),"are small ceramic figures, sculpture in a domestic scale, mantel-piece decoration". Since ceramic pieces crockery inclusive, serves both functional and emotionally appeal purposes, it requires that good attention, understanding and care be given them. Most ceramic wares are coated with a glass-like structure referred to as glaze. This coat or outer layer according to Otimeyin, (2008)" are vitreous or glassy coverings, fired on to the surface of wares." They are therefore the result of the melting or fusion of silica and other fluxing materials. The fused surface on these articles not only provides a glossy surface but retains a durable, attractive and resilient functionality for its user. It has being observed that after several uses, these wares tends to get worn out, with networks of cracks which most case harbours jams and bacterial. To prevent infections that are common with crack wares, it requires that such ceramic wares including floor and wall tiles be kept clean and that cleaning be done with soft sponge, cloths or mop. Dishes with noticeable cracks should either be done away with or properly treated by immersing in hot water of not less than 80^oc for 30 minutes after every wash.

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Understanding Ceramic Crockery

Crockery is a collective name for eating and serving dishes for both domestic and industrial use. Such dishes are small open containers as cups which are often with a handle meant for drinking liquids, in exception to a smaller container called eggcup used to serve boiled egg. Other forms of crockery are ceramic dishes which often are broad and hollow container plates for holding or serving food, most of which are Oven-wares that are heat resistant dish wares in which food can be cooked as well as served. Glass/ Ceramic Crockery, though quite fragile, remain the most important aspect of food service requiring great care in handling. Those glasses that are too frequently used or left in water for too long ends up having permanent water spot or cloudiness that deface the crystal surface. It is hereby advised that wares should not be left in soapy water for too long a time.

Tea set consist of a large teapot with lid an handle and spout matched with a set of six cups and saucers with a creamer and a sugar bowl are either of high artistic value reservedly for special ceremonies or there are of plain or simple designs for use in everyday life. This two group of crockery are the Industrial and Domestic Crockery, the industrial crockery differs from domestic crockery in the sense that domestic crockery does follow seasonal trends with priority on fashion, style and appeal, while industrial crockery are designed with emphasis on durability and functionality. The frequency with which such crockery can be replaced depends not only on the quality of wares but on the way they are washed and cared for especially the handling. However, crockery needs to be replaced after three to five years of usage even if it is not chipped or broken. Chipped and cracked Crockery should be disposed off immediately as such chips and cracks, encourages the gathering of dirt thereby making such article unhygienic for use in serving food. Apart from the chipping and cracks that causes bacterial is the aspect of glaze reacting with the effect of acids and bases in contact with certain food substances.

In addressing the various mechanisms by which acids and bases can dissolve glass and glazes, Richens, (2003) states that “the corrosion attack mechanisms on glazes and glasses can vary greatly depending in the pH and strength of the attacking medium.” Little did most users know that water is a very aggressive medium on ceramic wares especially when it reaches the critical pH of 9 by dissolution of alkalis from the glass surface thereby attacking the vitreous silica (ibid 2009). When this happens, a very minute quantity of the glass substance is dissolved in the water, this though may be said to be insignificant as to cause harm to the body but the continuous dissolution of this substance over time, may become harmful as the surface quality of the glass continually diminish. On the other hand, it is advisable that the strength of the attacked medium, that is the glass, must be such that can limit any attack. It is therefore really important that the ceramist compound glazes that are highly resistant to leaching by ensuring the glaze contains less of those oxides that are easily leached and ensuring proper fusion of the fired wares. To bring all the constituent oxides in a glaze composition into solution, there must be enough heat to properly melt every material into fusion. For glaze to melt properly, it requires that necessary time and temperature be applied to give a complete build up that gives the glazes a stable look that will not be subject to acid attack. Ceramic articles that are fired at high temperature and are well vitrified, are extremely hard, of low porosity level, and does not absorb nor dissolve in water.

There is the need to check the leaching of harmful compounds into food and drink by first teaching the potters to recognise leach-likely processes and materials or formulations that encourage leaching as well as knows solution to such problems, to reduce the barest minimum, the leaching of glass and glaze wares. All glasses do leach to some extent even when most people think of them as leach-less or as what water cannot infiltrate, glazes still could leach when in contact with food or water especially when such glazes contains metallic colourants other than iron oxide, barium, lead,

lithium etc.,. When the materials applied in production, are not well prepared and fired or properly melted, such glaze should not be expected to resist leaching. It should be noted that the lower the temperature at which a glaze is fired, the more the potential for danger when such ware is used to serve food.

Higher temperature glaze with high silica contents are less prone to leach because the higher the silica content of a glass or glaze coat, the higher the silica hydrate film will protect its surface but when there are more of alkali in the glass/glaze, the more they are prone to attack especially culinary acids that is formed when glaze/glass surface comes in contact with citric as orange, lemon or lime and sugar. <http://digitalfire.com>

Test for Leachable Glazes

To test for leachable glasses or ceramic glazes, a vinegar test could be used by simply filling a glazed container half full with vinegar and leaving it 10-12 days, after which the content is turned out, the container, is then washed and dried. The colour character and or surface texture of the half empty and half filled portions of the container is then compared, that is the above and below portions of the liquid line are matched up to note for any difference. Any noticeable difference in these portions is an indication that the glaze is subject to leaching. Lemon slice could also be placed overnight over a glazed surface or plate to test for leaching. When the lemon slice is removed, one can then look out for changes in surface gloss or colour. Any conspicuous difference in these parts is also a clue that the glaze is likely subject to leaching. Another test for leaching is to leave one of two identical pieces of glazed ceramic ware in a dishwasher for a few months and then compare them for differences in surface quality. When crazing is found, it is often a tip off that the glaze is potentially leachable. These tests ought to be carried out on glaze samples before large scale crockery production can be done.

Ceramic Crockery and Hygiene

The plates and cups that are used in serving food and drinks are though coated with impermeable glaze layers that make them safe for use, but efforts should be geared up at making sure that these wares remain in their safe condition whenever they are still in use. One should occasionally look out for network of cracks which most often develop after several years of usage. such wares become really unsafe for use especially when the underlying ceramic body is porous; it therefore creates micro-environmental damp in the craze or cracks and this most times host bacteria colonies. The use of crazed surface wares in serving meals should be discouraged, for doses of bacteria might just be hiding in such network of cracks in glazes. Elementary hygiene of simply washing food wares or dishes in hot soapy water must be of utmost importance for the most consistent success in personal home hygiene. Although, most infectious agents seem to be able to adapt to common antibiotics but a good, hot wash of ceramic dishes will eliminate bacteria that hide in cracks. Another great risk is in storing wet foods and liquids in crazed containers, it is advised that once glaze cracks are noticed in ceramic dishes, such should never be used for storing food again, they had better be discarded and flawless glaze surface dishes employed.

We have been eating off crazed plates for a very long time, its time such wares are either discarded or used for other purposes than serve meals. There may be no proof to support the fact that some people have become ill from eating off crazed plates and drinking liquid from cracked glaze cups, our understanding of how bacteria works is enough to justify this calm as they do multiply fast under any unhygienic damp condition. Conditions for the development of micro organisms in ceramic products according to Bastarach (2003) “are related to the presence of nutritive elements under the

influence of temperature, moisture and pH of the medium under this condition, the population of Bacteria especially in crockery cracks can double every 20 minutes.” We do hear cases of widespread food poisoning from time to time though without serious investigation on detailed cause most of which when investigated seriously, could be traceable to poor food and table hygiene practice. Hobb and Robert, (1993), postulates that “malpractices take place in food preparation which permits contamination with survival and growth of food poisoning bacteria” the food may not be infected with bacteria but once it’s served in a bacteria infected plate, it definitely would pass on to the food and onward to the consumer.

Crazed glazes with porous wares are known for creating breeding ground for bacteria for the greater part of the porous body, the wider the craze lines on its surface or the lesser the exposition of the ware to heat or damp, the more would be the threat.

Care for Crockery

To enhance the appearance and longevity of crockery, the following must be observed

- a) Leftovers should be wiped off using rubber scraper, soft cloth or paper towel and not with metal utensils that leaves marks on the ware
- b) Wares should be washed as soon as possible especially after each use
- c) Correct applications of detergents should be strictly followed especially when using a dishwasher.
- d) The use of abrasive cleaners or pot scourers should be discouraged as this will damage the glaze as well as the surface decorations.
- e) After every wash, the wares should be racked, ensuring they do not vibrate against each other

The Rinsing and Sterilizing Dish Washing Machine according to Pyke, (1982) are models which after having subjected crockery to a cleaning process, convey it through hot rinsing jets with temperature of final water between 66^oc - 82^oc by a thermostat. When dishes are exposed to this condition, for 30 seconds, the bacteria are eliminated. It is therefore recommended to big time hoteliers and restaurants who are the main users of crockery wares.

Suggestion

If a glaze is prepared from non-toxic materials like silica, dolomite, kaolin, feldspar, whiting, ball clay, etc. leaching is only a functional and aesthetic issue. But according to Hansen, (2003) “if the glaze employs metallic colorants (other than iron) or other minerals containing lithium, barium, lead, chrome, etc. then safety and legal liability becomes a concern.” Practising ceramist or potters therefore should be encouraged to take more time to study, test every glaze composed for leach possibility and have appropriate understanding of the materials they use in glaze preparations as well as ensure that the glazes are properly fired.

Conclusion

In the crockery world, circular plates are more in vogue, as the square shapes are more likely to break due to their protruding corners but in the quest for differentiation and creativity, signature dishes which come in different shapes and sizes are becoming more popular for creating new interest in the food being served. This notwithstanding does not take away the actuality that circular wares are more durable. Plates that are of semicircular edge are best when referring to chipping resistant; for this reason, sharp edges should be circumvented to avoid chipping. While explaining the influence of design on the strength of pottery, Rado, (1969) states that “pottery is susceptible to failure caused by

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local stress concentration due to abrupt changes in geometry (design) or loading”, this implies that design is of great importance in the durability of ceramic wares.

Crazing which are fine surface cracks on glazes on the other hand could cause harm to the body if not appropriately understood and handled. To check glaze surface cracks, it is suggested that the potter understands the materials being applied; the appropriate temperature for glaze maturity and the thermal strength of the ware, usually referred to as resistant to thermal shock are of prime significance for cooking ware. The Porosity which according to Glenn, (1971) is “directly related to the hardness and the vitrification of the clay” should therefore be verified vis-à-vis the partial glassification of a ceramic article when fired; it is the vitrification and proper glassification of clay body and glazes that eliminate leach, results in the characteristic hard, durable and rocklike properties.

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INDIGENOUS HAUSA INDIGO DYEING IN NORTHERN NIGERIA

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Abstract

The article focused on the effect of modern dyeing equipment, materials and methods on indigenous Hausa indigo dyeing. It also briefly looked at its possible origin, practice and problems. Also discussed were the factors that are responsible for its demise. In conclusion it was found that modern dyeing equipment, materials and methods are responsible for the displacement of the indigenous ones. It was also found that modern dyeing equipment, materials and methods are responsible for transforming the indigenous Hausa indigo dyeing to what it is today – a viable modern indigenous Hausa cottage and small scale dyeing industry. Finally recommendation on how the indigenous industry can be assisted financially and technically by all the three levels of governments in Nigeria was made.

Introduction

Textile dyeing according to Dhuinnshleibh (2000), is a process of colouring fibres, yarns or fabrics by using liquid containing colouring matter for imparting a particular hue to a substance. Traditional Hausa indigo dyeing was the only indigenous fibre, yarns, fabric and garment colouring process. It produced only different shades of blue, usually obtained by repeatedly dipping the yarns, fabric or garments into the fermented dye solution in dye pits. A sheen that is highly beautiful is produced from this dyeing process.

Through ancient interregional trading and other activities, exchange of ideas, equipment and materials between the Hausa and other people occurred. As a result, exotic dyeing equipment, materials, techniques and other textile products found their way into Hausa land. The consequence of this development was the displacement of the indigenous Hausa dyeing equipment, materials and techniques. As a result, most of the indigenous Hausa indigo dyeing centres folded up and subsequently replaced by modern ones.

Brief History

The original known dyes for indigenous Hausa dyeing was the local indigenous dyes, which some researchers believed to have oriental origin. Nasir (1984) reports that the indigo dye and the dyeing process were brought into Hausa land by the Berbers and Arabs from North Africa through the Trans-Sahara trade routes. The name of the indigo plant in Hausa is 'baba' (named probably after the people who were believed to have brought it into Hausa land), that is the Berbers, from North Africa, who according to Trimmingham (1962) were attending Western Sudan markets long before the advent of Islam and the Europeans.

Similarly, Heathcote (1976) links the origin of indigenous Hausa indigo dyeing process to the orient. He believes that Hausa indigenous indigo dyeing process was imported into Hausa land from the orient. The report of existence of surplus indigo plant in the oriental countries particularly India, China, Java and Japan by Ponting (1980), accorded some credence to Heathcote (1976) and Nasir (1984), reports on the oriental origin of the Hausa indigenous indigo Europe with large quantity of indigo dyes for decades, Dhuinnshleibh (2000) also believes that development in worldwide shipping and trading network was responsible for transporting dyestuffs from all parts of the world to Europe.

In a country view, Towry-Coker and Towry-Coker (1978) believe that the indigo-dyed hand woven strips and garments found in Egyptian tombs during the period of the Pharaohs was an indication that the indigo plant was present in Africa, even though it might not have been specifically cultivated for dyeing at that time. They concluded that this evidence refuted the usual contention that the indigo plant was introduced to West Africa in the seventeenth century from India.

The successful production of a synthetic indigo dye by a German company "Bayer" in 1897, weakened the position of the natural indigo. According to Ponting (1980), the new synthetic indigo was highly standardized, purer and produced better dyeing results than the natural indigo, as a result it pushed the natural indigo out of the world market. Perkin's accidental discovery of the first synthetic dyes in 1856, led to the successful manufacture of various types of synthetic dyestuff which according to Steele (2002), largely replaced the natural dyes world-wide.

Indigenous Dyeing Materials

Prior to the introduction and subsequent acceptance of synthetic indigo, other imported dyes, chemicals and dyed fabrics, the Hausa traditional dyers were renowned for their skill in indigo dyeing. The techniques, equipment and dyeing materials were indigenous and simple. Indigo dyeing among Hausa people was highly a specialist occupation usually for men. Hausa cities, towns and villages had many deep circular dye – pits usually grouped in clusters, but sometimes arranged in rows with a dyer having a minimum of two or more pits for dyeing and rinsing of the dyed yarns, fabrics or garments. Dahiru (1982), Highet (1984) and Heathcote (1976), reported how the indigenous dyers owned several dye pits, practiced dyeing and produced fine dyed yarns, fabrics and garments.

In their separate studies of Hausa indigenous dyeing, Dahiru (1992) and Nasir (1984) observed that the dyeing techniques, equipment and materials, are similar in Hausa land with some slight differences in the names of certain equipments, materials or techniques. For example, Nasir (1984) study of traditional dyeing in Kano showed no significant difference from Dahiru (1992) study of traditional indigo dyeing in Zaria city. For instance, the name of an indigenous dyeing area in Zaria is 'Karofi' instead of 'Marina' as it is popularly known in Kano or Katsina. This does not mean that Zaria people do not call it 'marina' or Kano people do not call it 'karofi.' The two names are the same, it is only that the name 'karofi' is used more in Zaria, while 'marina' is used more in Kano or Katsina.

Indigenous materials and equipment involved in carrying out indigenous dyeing processes as presented by many researchers, which include Dahiru (1992), Nasir (1984), Adetoro (1980), Heathcote (1976), and Eicher (1976) include dye-pits, indigo, wood ash, sediment from the dye-pit (dead remains of used indigo known as 'katsi' in Hausa), long stick, pail, wood, yellow powder from locust bean pod, dry cow dung and guinea corn husk. Although the process of preparing the dye solution slightly varies from one Hausa community to another as Heathcote (1976) observed, the equipment and ingredients are basically the same. Before the advent of foreign fabrics and yarns, indigenous hand spun yarns, hand woven fabrics, and indigenous ready-made garment were the items being dyed.

Dhunnshleibh (2000) stresses that the eighteenth and nineteenth century colonization and the industrial revolution, ensured large scale production and continuous supply of foreign dyestuffs. Advances in science and technology made the production of good dyes (natural and synthetic) chemicals and variety of fabrics increasingly possible and easier. As a result, variety of dyes, chemicals, fabrics, dyeing equipment and materials spread rapidly to different parts of the world, reducing or completely abandoning the use of the indigenous ones.

Modern dyeing equipment, materials and dyeing techniques influenced and encouraged commercial dyeing and the use of dyed indigenous Hausa men's garments and other article of clothing. Colour fastness has always been a serious problem of the traditional dyers, that was why they used to over-load the yarn, Fabric or garment with dyes. The result of the overloading of the dyes was always the rubbing off the access dyes on the skin of the wearer, or on any white or light coloured clothes that are worn together with the dyed ones at the same time.

Towry – Coker and Towry – Coker (1978) observed that the process of the indigenous dyeing depends on the number of dippings in order to obtain the desired shade of colours. Highet (1984) also confirmed that the required shade of blue is determined by the number of dippings and the lengths of time the cloth stays in the dye pits containing the dye solution.

The many number of dippings and the longer period of time the garments or fabrics stay in the dye are all part of the attempt by dyers to satisfy their customers and maintain their indigenous dyers) good commercial dyeing reputation. The higher the number of dippings and number of hours the item of clothing being dyed stays in the dye solution, the better the dye penetration and levelness of the dyeing. Nkeonye (1987) repots similar process in modern commercial dyeing where, he observed that the achievement of commercially acceptable dyeing requires not only that the dyeing be level, but that there must also be good dye penetration.

Involvement in Indigenous Indigo Dyeing

Traditional dyeing process is difficult and time consuming, in addition to the involvement of large number of equipment and materials. The involvement in the traditional dyeing process includes:

1. The process of constructing the dye pits
2. The production of the indigo cakes
3. The preparation (mixture) of the indigo solution for dyeing
4. The actual dyeing process

Each of these process consumes plenty of time and materials for example, Dahiru (1992) and Nasir (1984) confirmed the use of the following tools and materials in the four stages listed above.

- a. Some of the equipment and materials involved in the process of constructing the dye pit are
 1. Digger and hoe
 2. Pail
 3. Sediments from existing dye pits
 4. Dry cow dung
 5. Animal hairs from tanneries
 6. New leaves of thorn shrubs
 7. Guinea corn husk
 8. Empty locust beans pods
 9. Small thatch cover

- b. Production of the indigo cakes
Some of the equipment and materials involve in the production of the indigo cake are
 1. Machet
 2. Sickle
 3. Indigo leaves
 4. Large pots

5. Fairly long stick

The minimum average time taken for the production of the indigo cakes as given by Nasir (1984) is about three days, excluding drying period.

c. Preparation (mixing) of the indigo solution for dyeing. Some of the equipment and materials involve in the preparation or mixing of the indigo dye solution are:

1. Indigo cake
2. Water
3. Sediment from existing dye pits
4. Wood ash
5. Empty locust beans pods
6. Yellow powder from locust beans pods
7. Long Paul.

The average time taken to mix the indigo solution is seven days

d. The actual dyeing

The amount of time consumed during the actual indigenous Hausa indigo dyeing usually depends on the shade and levelness of colour needed. These are determine by the length of time of the item being dyed stayed in the solution and the number of dipping made.

The amount of involvement in the indigenous process as shown above are enormously and tedious. In comparison with the indigenous dyeing processes above, the modern dyeing processes are superior, especially in terms of working flexibility, speed of production, increased productivity, variety, quality and so forth.

For example modern dyeing equipment- such as plastic, iron or aluminum containers (which can easily be bought) are fast replacing the traditional dye pits (where they are still existing). Assorted modern dyes and chemicals, (including synthetic indigo), highly standardized, varied, purer with high colour fastness, have also replace the indigenous ones. Other additional advantages include the availability of safety equipment such as rainboots, protective hand gloves and mask.

The modern dyeing processes equipment and materials made the traditional dyeing and dyes to diminish both in popularity and practice. However, modern dyed fabrics lack the usual aroma and sheen of the indigenous Hausa dyed fabrics produced by the traditional calendaring process. Nasir (1984), Dahiru (1992) and Heathcote (1976) discussed similar processes and agreed that modern dyes, chemicals and other dyeing equipment and materials as agents of influence are responsible for the demise of indigenous indigo dyeing profession today.

Recommendations

Entrepreneurially, this small scale industry can be further encouraged by developing it to boost the Nigerian economy, through technical and financial support from all level of governments in Nigeria and the private sector.

There is also the need to sensitize the owners and managers of the indigenous small scale industries by organizing workshops on production, marketing and management techniques, for the benefit of both the industry and the Nigerian society.

Conclusion

Availability of these modern dyeing equipment, materials and techniques as well as ease of processing and speed of work, led to the demise of the indigenous ones and opened up many job

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opportunities for young Hausa men. Many of them who have taken up modern dyeing profession, are ignorant of the indigenous Hausa indigo dyeing process completely.

The number of modern small scale dyeing industries found in Hausa cities and towns today is high. Some of them combined dyeing with traditional calendaring. Most of the workers are young secondary and tertiary school leavers, who confirmed, that the simplicity, ease of work and training programmes offered by some governmental and no-governmental organizations made them to take up modern dyeing as a profession.

Some of these small scale dyeing industries are fairly big and organized, with many employees. Hanyoyi Ta Alberi, and Mabuga Dyeing Centre in Zaria, Kaduna State are good example of such small dyeing industries. The dyers only carry out plain dyeing, that is single colour dyeing, only in rare occasions that you come across pattern or multicoloured dyeing.

These contemporary indigenous Hausa small scale dyeing industries play an important role in the social, industrial and economic development of Nigeria. One of their contributions is the provision of productive employment to many Nigerians.

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