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## Design and Fabrication of a Wall Plaque on Some Landmarks in Ghana

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### **Abstract:**

*Design and fabrication of a wall plaque in a form of a metal piece has been in existence for many years that dates back to around the middle of the 16<sup>th</sup> century, the era of the evolution of plaques. A plaque is any flat, thin piece of metal or the like, used for ornament, or for depicting or painting pictures upon hung on a wall. This publication seeks to display design and subsequent fabrication of the wall plaque featuring the relief of some major Landmarks in Ghana to help enlighten the public to appreciate all the available tourism landmarks in the Ghana. The technique for fabrication is embossing, chasing and repoussé. The main materials for production is copper and brass which was efficient and effective in the fabrication. The methodology used in collecting data for this research project is Descriptive Research. The main data collection instrument was face-to-face oral interview and recorded all responses personally, a critical observation was also done.*

**Keywords:** Wall plaque, chasing, repousse, embossing, patina

### **1. Introduction**

Plaque may refer to a Commemorative plaque, Plaquette, or a Memorial Plaque (medallion). This publication is centred on Commemorative plaque, which is a plate of metal, ceramic, stone, wood, or other material, typically attached to a wall, stone, or other vertical surface, and bearing text or an image in relief, or both, in memory of one or more persons, an event, a former use of the place, or some other thing.<sup>1</sup> This will feature some landmarks in Ghana, these landmarks are recognizable natural and man-made features used for navigation, features that stand out from their environments as local or national symbols and are often visible from reasonable distances. They can be monuments or distinctive buildings, relief features, water bodies or vegetative features. They are the features that make up the country's source of tourist attraction. Ghana's rich environment and cultural heritage, coupled with the many landmarks that range from waterfalls, lakes, mansions and memorabilia, position the country as a tourist site for most foreign visitors and locals. Foreigners and even some Ghanaians do not know the locations of the country's cherished landmarks. Some Ghanaians have knowledge of the sites in their locality and little or no idea of the ones in other localities. Site maps are not very common and are often in two-dimensional graphic prints which are not motivating enough. An embossed relief map which can be Tile Mural, Leather Carving, Wood Carving, and Chasing and Repoussé but Chasing and Repoussé will be a comparatively better option. The techniques of chasing and repoussé utilizes the plasticity of metal, forming shapes by degrees. There is no loss of metal in the process, as it is stretched locally and the surface remains continuous. The process is relatively slow, but a maximum of form is achieved, with one continuous surface of sheet metal of essentially the same. Direct contact of the tools used is usually visible in the result, a condition not always apparent in other techniques, where all evidence of the working method is eliminated.<sup>2</sup> In brief, Ghana has a diversity of Landmarks dotted all over the country including historical, ecological and cultural heritage and beaches.

## 2. Materials and Methods

### 2.1. Tools and Materials

Brett (1990) argues that a tool is a device which is used in making items in the studio or workshop.<sup>3</sup> In this vein, the materials used in the fabrication of the wall plaque include a wood block (37 by 26 inches), Copper Sheet (35.9 by 24 inches), an A5 brass sheet, Asphalt, Sulphuric acid, sulphur, caustic soda and nitric acid. Asphalt and nitric acid were used to etch the immediate background designs of the wall plaque. Equipment used included the drilling machine, the flexy shaft, gas blow torch and the annealing table for annealing and soldering, and Sand Bags for support when chasing. Tools necessary for fabrication included chasing tools and hammer (for chasing out intricate parts of the design to stand out well), Jeweller's saw frame and blade –used in cutting out the letters and the Black Star Gate, tweezers, scratch brush, needle files and big files Hammer, Chisel – used for carving the reliefs for embossing, wooden mallet, sticks as punches and rubber mallet were used for embossing the metal sheet.

### 2.2. Methodology

Descriptive research method based on the qualitative research approach was employed. According to Babbie (1989), descriptive research is the accurate and systematic description of data and characteristics about the population or phenomenon being studied.<sup>4</sup> The descriptive research method is necessary because existing wall plaques had to be document, described and analysed before coming out with designs. This research method was used to examine, analyse and describe objects that would be represented, and document all the processes used.

Since the wall plaque will feature some man-made and natural Landmarks in the ten regions of Ghana, most information was collected from the internet, magazines and also from Lecturers and students of the Metal Product Design Section to aide in our research work.

### 2.3. Design and Fabrication Stages

The project was targeted at designing and fabricating a metal plaque depicting some landmarks in Ghana from the information and photographs of the artificial and natural landmarks in Ghana. The project was started by making preliminary sketches and drawings. The first step towards the design was to come up with a graphical map of Ghana indicating the regional boundaries as shown in figure 1 below;

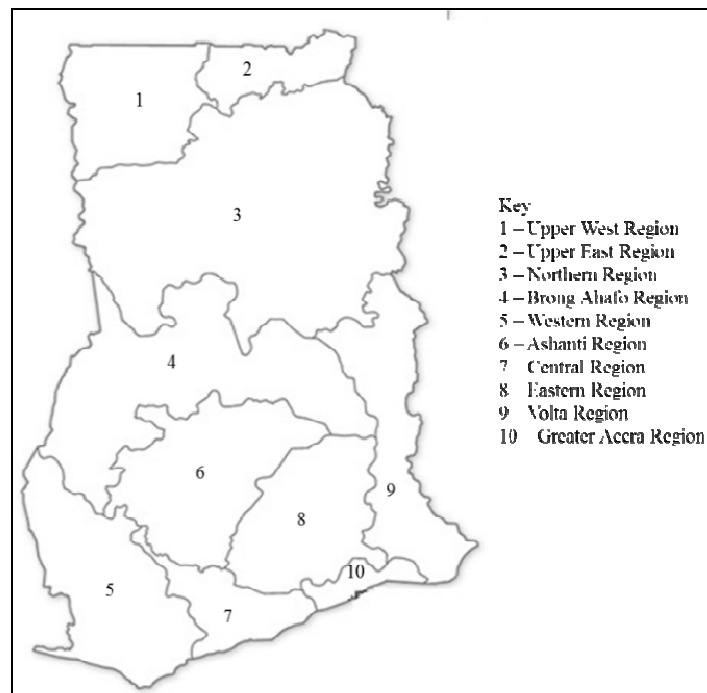


Figure 1: The Regional map of Ghana

The next step was to generate icons to represent the selected landmarks as seen in figures 2 to 7 below;

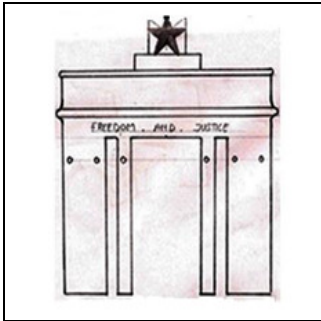


Figure 2: The Black Star Gate



Figure 3: The Light House

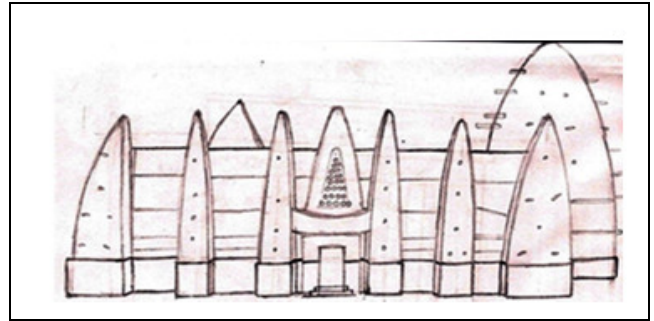


Figure 4: The Larabanga Mosque

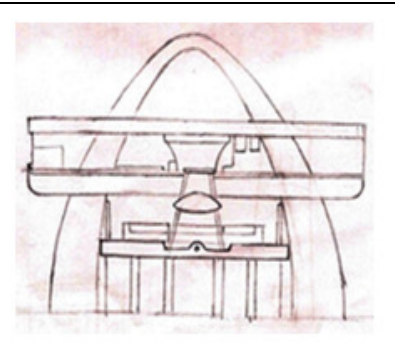


Figure 5: The Independence Arch

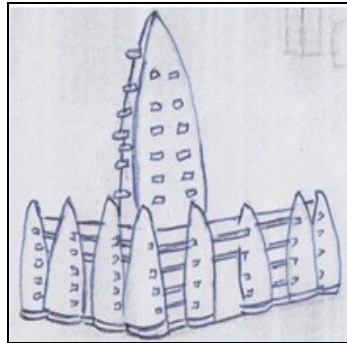


Figure 6: WaNaa's Palace



Figure 7: OkomfoAnokye's Statue

The next step was the superimposition of the icons on the map. The options generated were drawn on sheets of paper with pencil, the design selected is seen in figure 8 below. This was magnified to a dimension of 30 by 20 inches to form the working drawing

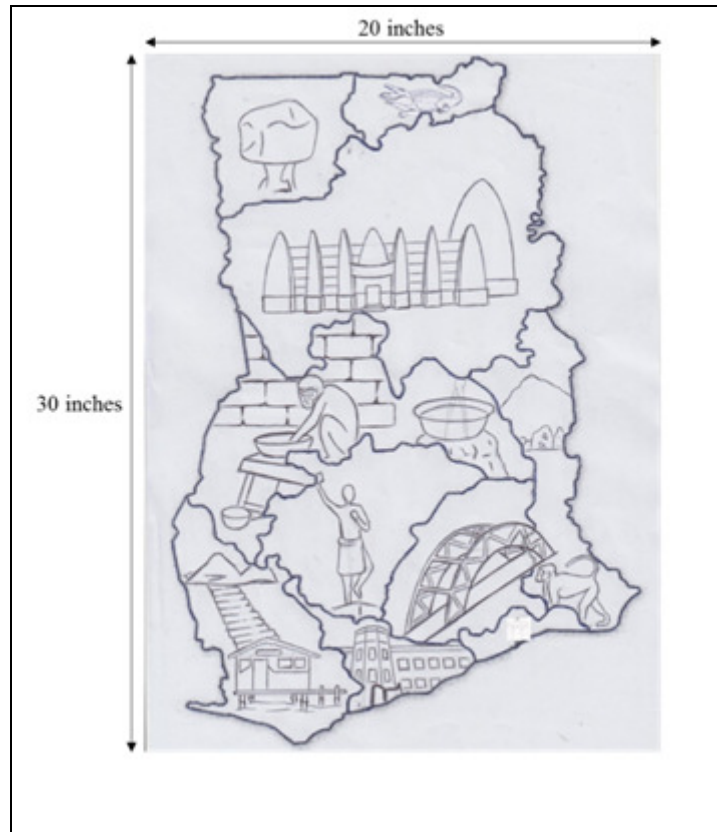


Figure 8: The working drawing

The fabrication techniques employed are embossing, chasing and repoussé in combination with the use of some materials, tools and equipment discussed previously. Some parts of the wall plaque had to be pierced and etched.

A wooden mould was prepared to aid in embossing the regional map of Ghana in sheet metal. A hard wood block measuring 37 by 26 inches was acquired and the surface was planned and smoothed. The working drawing of the regional map of Ghana was printed and pasted onto the wood using a white glue. The mould was carved with the aid of chisels and mallet. The regions were demarcated with the application and alternation of the high, semi and low relief techniques in carving. After carving the mould, it was smoothed with sand paper in readiness for embossing.



*Figure 9: The carving of the wood for embossing*

A 1 mm metal copper sheet measuring 35.9 by 24 inches was acquired and annealed to soften for the embossing process. It was pickled, washed with clean water, and wiped clean in readiness. It was then placed over the mould and fastened with screws at all sides of the mould to prevent shifting while embossing.

The first step was to hammer across the copper surface with a rubber mallet. By so doing, the copper sheet yielded to the carved impressions in the mould below. These were later worked into detail using varied shapes of wooden sticks followed by metal chasing tools for a higher definition of all Regional demarcations on the Ghana map.

The icons or landmarks were pasted on the embossed regional map of Ghana. The outlines were marked out onto the embossed regional map and later worked into a detailed high relief with the aid of assorted chasing tools, a hammer and a sand bag backing.



*Figure 10: The Chasing and Repoussé of the design*

The desired impressions were created by working the sheet copper from the front and backsides. The final result can be seen in figure 15 below.



*Figure 11: After Chasing and Repoussé*

The icons of the Black Star Gate and the inscription, 'SOME LANDMARKS IN GHANA' were pierced out of a brass sheet of thickness 1mm. They were then arranged on the embossed copper work for the soldering process. Flux and easy solder were applied, and with the aid of a blow torch, they were soldered into position.



*Figure 12: Soldering of the letters and Black Star Gate*

Etching is the process of using strong acid to cut into the unprotected parts of a metal surface to create a design of intaglio and relief in the metal. Asphalt was dissolved with thinner into an applicable consistency. With the aid of a sable brush, irregular designs were drawn onto the immediate background of the embossed map and allowed to dry. Areas that needed to be protected from the effect of the acid were also covered with the asphalt solution.

The asphalt designs were thoroughly dried, after which 1 part of nitric acid and 3 part of water was applied to areas that needed to be etched. The process was closely monitored and controlled to avoid accidentals. Satisfied with the depth of etch, excess acid was washed off the work, followed by the washing off of the asphalt with thinner. The final wash was done with warm soapy water and a scratch brush followed by a rinse with clean water. The work was wiped dry as seen in figure 16, ready for the next process which is patination.



Figure 13: After Etching

The patination process gives the work an antique look. The work was first annealed, pickled, scratched brushed and rinsed with clean water to remove any grease on the surface of the metal, and wiped clean. A patina solution of a little drop of sulphuric acid, water, 2 part of sulphur and 1 part of caustic soda was prepared by heating the mixture in a basin. A piece of foam was acquired which was used in dabbing the solution onto the surface of the metal, and scratch brushed in water. The work was allowed to dry under the sun for 30 minutes. The high and low areas of the design were demarcated using steel wool and the end result as shown in figure 14 and 15.

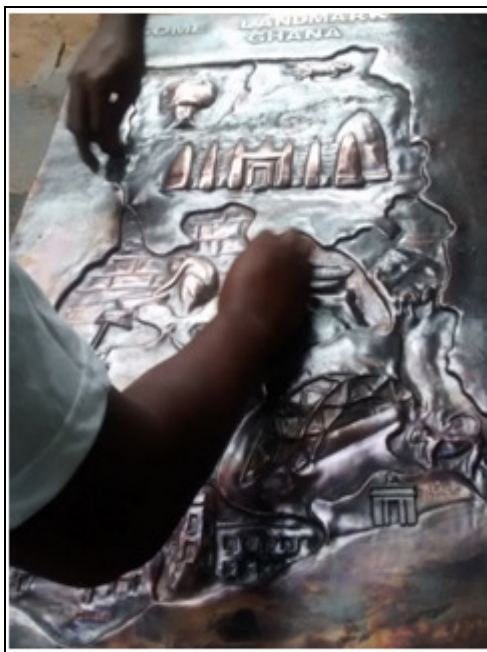


Figure 14: Making of the high and low tones after patination



Figure 15: Making the various tones

The captions of the landmarks were engraved on the plaque beside the representative icon on the map with the aid of an engraver. Lacquer mixed with thinner was sprayed onto the metal work and allowed to dry, forming a hard protective glassy like coating on the metal. This was done to protect the surface from tarnishing and also as an enhancement. A wooden frame measuring 39.5 by 27.5 inches was finally prepared, sprayed with black oil paint, and used in framing the work as seen in figure 16.



Figure 16: Finished Work

### 3. Results and Evaluation

#### 3.1. Tests and Results

The idea of designing and fabricating a decorative wall plaque on some landmarks in Ghana was born out of careful observation of some already existing wall plaques and landmarks found in Ghana and the desire to inform, inspire and guide some Ghanaians and would-be tourists.

On completion, the plaque was placed side by side with a graphical map to ascertain the one which best depicts the reality on the ground and inspires tourism. A total number of forty-five persons were invited and opinions were sought. The respondents were of the opinion that images on the plaque looked more realistic and their contours can even be felt by observers. Majority were of the opinion that the realism associated with the plaque inspired them to visit those areas more than they felt with the graphical maps. They also commended the comparative durability and aesthetic appeal of the plaque.

#### 3.2. Evaluation

The plaque consists of a copper sheet metal, framed with wood. It has a vertical picture area measuring 39.5 inches by 27.5 inches. It bears a pierced and soldered brass inscription titled: "SOME LANDMARKS IN GHANA", which introduces the theme of the composition to the observer. The Artists deployed all the techniques involved in relief art representation to create the desired effects and imagery. Some images were represented in low relief, others medium, and the rest in high relief.

The map of Ghana was represented in sunk relief while the regions were in varied alternating degrees of medium relief, superimposed by high relief of the landmarks for emphasis. The landmarks that were featured included the mushroom rock in the Upper West Region, Paga Crocodile pond in the Upper East Region, the Larabanga Mosque in the Northern Region, the Boabeng-Fiema Monkey Sanctuary and the Heritage of BrongAhafo in the BrongAhafo Region and the Virgin Island and Nzulezo in the Western Region. Others include mountain Afadjato and the Tafi-Atome Monkey Sanctuary in the Volta Region, the Adome Bridge in the Eastern Region, the OkomfoAnokye's Statue in the Ashanti Region, and the Cape Coast Castle in the Central Region and finally, the Black Star Gate in the Greater Accra Region.

The effective harmonization of light and shade was very evident through the use of Oxidizing agents of copper to darken the surface, followed by the fine-sanding of high areas leaving a shaded lower background to project the images formed. The textures around the map of Ghana together with the variety of Landmarks represented, added to the enhancement of the work.

### 4. Conclusion

This project was very challenging and yet, very exciting as it thrilled us into harnessing and applying all the theoretical and practical knowledge acquired over our four years in the Metal Product Design programme. Our experiences were really put to test as we had to take and implement certain decisions on our own. We feel satisfied and excited by the success achieved. The success of this project would give room to all metal design artists and students to explore in this field to help showcase and inspire tourism in Ghana and the world as a whole.

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