

To commemorate the death also, since our last meeting, of V.Wor. Bro. Jack Upham, one of our most zealous members of this Lodge in the past, the following paper of his from May 1987 is set down again:

CONSTRUCTION PLANS FOR THE TEMPLE OF APOLLO AT DIDYMA

(An insight into Ancient Tracing Boards)

How did the Greeks design and build their classical monuments, which in the course of time have repeatedly been regarded as exemplary?

What skills did the erection of these imposing marble edifices require?

The answers to these questions were sought by archaeologists for more than 200 years

Although it is known that the Greek architects themselves wrote detailed explanations of the conception and construction of their buildings, none of these written works has survived to the present day. No other sources reveal what kind of construction plans (if any) were followed by the ancient builders. In the absence of any descriptions of temple "blueprints", scholars had no idea of where to look for them.

Actually the blueprints were under the archaeologist's nose all along. An entire archive of construction plans was recently discovered still in place at a site that has been under study since the turn of the century; the famous ruin of the Temple of Apollo at Didyma, south of the present-day Turkish town of Soke.

In October 1979, a German archaeologist, Lothar Haselberger, came across many finely etched lines on some of the Temple walls. It developed that the lines trace out the design of various temple structures. They cover hundreds of square metres and constitute the most extensive and the most complete set of plans that have come to light in all ancient architecture.

The construction of the Temple of Apollo, the Greek God of light, art and prophecy, was begun under the patronage of the powerful trading city of Miletus, in the southernmost part of Ionia. The Temple, which was to house the most famous oracle in the eastern reaches of the Hellenic world, was meant to replace an earlier building (on the site of an even earlier shrine) that had been destroyed by the Persians.

Planning for the Temple began soon after 334 BC, when Alexander the Great arrived in Asia Minor. The Milesian architect Daphnis collaborated with one of the leading architects of Ionia, Paionios of Ephesus to design the ambitious structure. Paionios at the time was completing his work on the renowned Temple of Artemis in his native city-state. This Ephesian temple, which was the largest Greek temple up till then, was numbered among the Seven Wonders of the ancient world.

The new Temple of Apollo was foreseen as equalling the Temple of Artemis in size and splendour.

Work, however, was slow and ceased after 600 years, remaining unfinished until an earthquake in the Middle Ages demolished most of it.

Even as a ruin the great marble edifice is impressive. Three columns only still stand, 19.7 metres high on a platform 120 x 60 metres. One is unfinished in rough-hewn stone and two were completed.

A double ring of these tall columns (108 in all) was intended to encircle the walls of the temple's inner sanctum. Twelve additional curved columns in three groups of four, stood in the portico, which faced roughly eastward. Most of the columns were in position at the time construction was halted.

Within the temple, an inner courtyard, below the main platform or podium of the temple, forms the adytum or Sanctum Sanctorum, forbidden to all but a select few.

This contained a bronze statue of Apollo, who was supposed to have been conceived under a laurel tree there, where a sacred spring arose from the ground.

On the podium walls surrounding the adytum were a large number of finely etched parallel lines. 1.8 to 1.9 cm apart, other straight lines and a number of curves. Traces of a reddish pigment have been preserved on the walls, evidence that a red chalk had been applied to the marble surface, enabling the incised lines to

stand out against the dark background. Also if corrections were needed, additional chalk was applied to cover the incorrect lines. Sufficient of the lines remained to enable drawing in on copies made of the lines.

It was found that various parts of the temple had been drawn to actual size. This included the 18 metre high columns. The walls of the adytum of course were too low to permit drawing these vertically and in fact they do appear horizontally. These lines curve out in a slight arc along their length to a maximum variation of 4.65 cm from the straight.

As these columns are built up in blocks about one metre high, on top of, and keyed into one another, each had to be individually sized to accommodate the 4.65 cm curve and placed in their respective positions. From records preserved, it is known that several of these columns were only partly erected.

Fluting of the columns was not done until they were erected. This is evident as one of the three existing columns is uncompleted, without fluting, while the others are fluted.

Another drawing on the walls shows the plan of the fluting, 24 flutes to the column. Yet another drawing consisting of various semi-circles and lines, shows the formation of the bases for the columns, less the horizontal fluting, which was incorporated later. Many other drawings were found for other parts of the temple.

As well as using the walls for drawings, floors were used, being covered over by other layers as the building progressed.

Necessary parts of the drawings were transferred to the new layers. Apparently early drawings before commencement were done on papyrus, wood tablets or flat stones. These latter have since been found in other temple ruins.

They are apparently incorporated into the building when finished and covered over. Those on the adytum walls would in due course have been polished off with the final completion of the work.

Some idea of the cost of the temple may be obtained from the book-keeping records which exist, which show that each column, of which 120 were required, cost roughly 40,000 drachmas, or on today's figures over a million dollars.

Apparently their techniques were similar to those used by the early Egyptians 2000 years earlier and in Gothic churches 1500 years later. Evidence of similar lines have been found in various places.

By inference, the same methods must have been used in the construction of King Solomon's Temple.

It is hoped that this treatise may give some insight into the origin, form and use of Tracing Boards.

Acknowledgments to "The Scientific American" and an article by Dr. Lothar Haselberger

ILLUSTRATIONS

In the course of his address, V. VV. Bro. Upham displayed a set of illustrations of the temple in various stages of construction and of details of particular sections of the work.

These pictures served to greatly enlighten the brethren present and gave a much clearer understanding of the speaker's explanations.

Unfortunately it is not within our resources to reproduce such pictures in our journal but copies will be supplied to any members on request.

(Ed. Bro. Jack Upham must have kept the illustrations. He wrote for this paper after he moved to Bundaberg and probably delivered it to his adopted Lodge Tynan, there.)