

THE PILLARS

The September 1976 Transactions of the United Masters Lodge No. 167 of New Zealand described the August meeting: "In place of the usual Paper, the August meeting of the Lodge was devoted to Questions and Answers. The Brethren gave prepared answers to the questions and discussion followed."

Question 8:

- (a) Were the two great pillars, B. and J. cast in one mass or in two sections?
- (b) Had they any significance other than as a reminder of the pillars of fire and cloud?

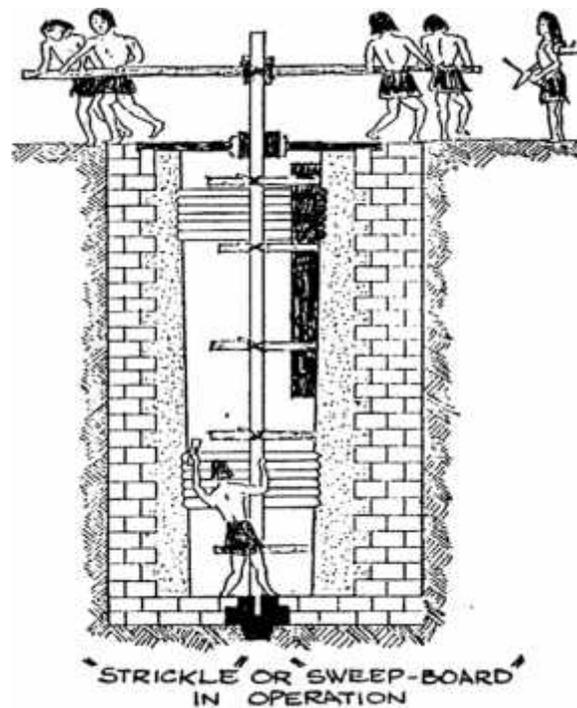
Answer by Bro. R. Adams:

(a) This question is one which has occupied my mind for many years and for which unfortunately, there does not seem to be a universally accepted answer. However, it is my opinion that the Pillars would have been produced as single castings, by moulding them vertically in the ground. The chapters or capitals cast separately and placed on top of the pillars after they had been established were placed over the 'pommels' or dome shape of the chapters, to add the finishing touch. The method of casting the pillars, as proposed herewith is based solely on how I think that the task could have been most easily accomplished, with the technology and labour resources believed available at that period, and which may be divided into four fundamental steps.

1. The Mould
2. The Core
3. Melting and Pouring
4. Cleaning

Details of the processes involved in each of the operations listed above are briefly as follows.

THE MOULD - The easiest and most usual method of producing a mould cavity for large cylindrical castings, such as these two pillars, is by means of a 'Strickle' or Sweep Board. A strickle is the name given to a flat piece of wood used for levelling grain in a measure, and sweep recalls the rubbing action of a brush or broom. In a foundry, these terms are used for pieces of wood, (sometimes metal faced) which remove extra thickness of moulding sand, after it has been built up to the approximate shape. The mould is built up with large bricks; these are then plastered over with a thick layer of moulding sand, and the final shape of the mould cavity being obtained with a strickle or sweep board made to the desired profile and measurements. In setting up strickle tackle, the moulder erects a central vertical post which can be rotated by means of a horizontal beam fastened to its upper end, then with the aid of a wooden profile of the desired shape, attached to the central post, he can then strickle or sweep out a perfectly circular cavity in the moulding sand.



Now moulding sands may contain from two to fifty percent of clay, depending on its use, which with a suitable water content, forms the principle source of strength and plasticity of the moulding sand. Clay is the bond or binder of moulding sands, and without it the sand would not maintain its shape when dried out. In certain parts of the world, deposits of sand and clay occur mixed naturally in proper proportions, and can be mined and used directly for moulding purposes, known as 'naturally bonded sand.' Such deposits are to be found in this country, the main one being at Green Island, just south of Dunedin, and is the principle source of moulding sand for the foundries throughout New Zealand. It is possible then that similar deposits may have existed in the plain of Jordan, between Succoth and Zeredathah, where the pillars were cast, II Chron. c4 v 11, 17 refers. Preparation of the mould and the actual casting must have taken place during the long dry season as water and metal form a very explosive mixture.

Firstly a rough hole would have been dug to the required overall depth, in this case something in excess of twenty seven feet, a footstep bearing or anchor block embedded into the bottom of the hole, and the floor bricked over to form a solid level foundation. The sides of the hole would then be bricked up to ground level. Then the central vertical post would be established in the hole, its lower end located in the foot step bearing, while its upper end is held just free to rotate, within a suitable wooden bracing or system of rope stays . Sweep boards are then attached and set to the desired radius, the sides of the bricked cavity are then plastered over with a thick layer of moulding clay and strickled to a smooth finish, small surface defects corrected by hand. The accompanying illustration gives some idea of the proposed method of operation. Once completed, the mould cavity would have been dried and baked hard to enable it to withstand the heavy rush of molten metal. This same method would have been used to produce the chapiters or capitals.

THE CORE - At the same time as the outer mould cavity was being formed, cylindrical core pieces would have been manufactured, also by means of a strickle. The impossible task of handling a relatively soft core, twenty seven feet long and weighing twenty eight tons, could have been overcome by making it in several pieces. These core pieces would have been of an outside diameter sufficient to give a hand thickness of metal to the finished casting, (about three and one half inches), and of sufficient size and weight, as to be handled without breaking. They would have been designed so as to be capable of being lifted and accurately stacked one upon another when lowered into the mould. After being baked hard by some suitable form of firing, they could then be lowered into the mould cavity to form the central core.

MELTING AND POURING - This would have been the most difficult part of the whole operation, for although copper based alloys had already been produced for upwards of two thousand years at that time, it is the size of the melt, in an apparently remote region, that makes it so awe inspiring. All surviving artifacts of

the Bronze Age are small objects, infinitely easier to cast than these pillars which would have required some thirty tons of bronze apiece, with the chapters weighing an estimated five to six tons each. In 1938 Dr. Nelson Glueck discovered the remains of King Solomon's copper smelter-refinery at Ezion-Geber, the furnaces of which were so well constructed that some of the mud brick walls still stood to their original height, with their double rows of flues, turned green by Sulphurous gases, still clearly visible. This industrial complex, complete with its mines and worker housing estates, was so large that it was only surpassed for size in fairly recent times. Siting the refinery at Ezion-Geber was especially chosen for the way the surrounding hill funnelled the prevailing northwest winds through the rows of flue holes, thus supplying a forced draught to the furnaces without recourse to large bellows. These discoveries by Dr. Glueck point out that the basic principles of furnace design were well understood at the time the pillars were cast. Dr. Glueck is of the opinion that all the copper used in the building of K.S.T. came from the refinery at Ezion-Geber, and was transported 180 miles north to the casting site in the plain of Jordan. The melting point of copper based alloys are well within the range of wood charcoal fires; to reduce the size of the melt to manageable proportions, more than one furnace would be used at the casting site. At the appropriate moment the furnaces could be tapped and the molten metal directed to suitable channels directly into the awaiting mould, which being open at the top, would allow easy escape of the gases and fumes that are generated during the pour. It is also certain that the pillars were cast in bronze. Brass is a mixture of copper and zinc, and zinc was unknown in early times; brass is more difficult to cast than bronze, and a different type of furnace is required, or the zinc would be converted into a gas and driven off.

CLEANING - Once the casting had cooled sufficiently it could be removed by digging away one side of the mould to form a long incline. The casting could then be tipped over onto this sloping surface, the central core cleaned out to reduce weight, and finally moved up the incline to level ground.

CONCLUSION - I believe the pillars were cast in one piece as it appears the easier method; casting in several sections pose some additional problems for the moulder, especially where the joints occur. Squaring the ends of the sections to ensure straight even columns on final assembly would also have been a mammoth task for those times. The plastic nature of bronze may have allowed the ends to have been squared by hammering, without the use of cutting tools, but each end to be so treated would be eighteen feet in circumference and three and one half inches wide. However whether cast in one piece or in sections the proposed method of making the mould by strickling would have been the same as described herein. Against the comparative ease or difficulty of transporting these pillars, we may bear in mind the pair of Obelisk's in front of the Temple at Karnak, erected some centuries before Solomon's Pillars, and which are said to be almost eighty-eight feet in height and weigh three hundred and fifty tons each.

Unlike King Solomon's copper smelter at Ezion-Geber, any theories surrounding these pillars are not supported by archaeological discovery of any kind. No evidence of the actual casting site in the plain of Jordan has ever been found, and comparatively little work has ever been done on the site of the Temple. The generally accepted site where Solomon's Temple once stood, is now occupied by the Mosque of Omar, or Dome of The Rock, as it is sometimes known, and any reluctance to have this holy place excavated and disturbed is quite understandable. Archaeological finds continue to substantiate the details and general background of Biblical accounts; someday fresh evidence may be brought to light and solve this question beyond any doubt, in the meantime we can only speculate and marvel.

(b) There has been a great deal of speculation as to the possible meaning and significance of the Two Pillars, and the suggestedly phallic origin has done little to settle the controversy. To answer the question properly, it is necessary to divide it into two parts. 1. Their original significance to the people of that era, and 2. their adopted significance to us as Freemasons.

First comes the question of why they were given names at all; it appears to have been the custom amongst ancient Mid-Eastern peoples to give names to sacred objects or buildings. It is to be found in the book of Exodus c 17 v 15 that, in celebration of the Israelite's victory over the Amalakites, Moses built an altar and called the name of it Adonai-nissi, (the Lord is my banner). So it is reasonably certain that the two pillars

were not just objects of architectural function, but must have been sacred, because of the peculiar names given to them.

Now as to the second part, it is my intention to deal only with their significance adapted to Freemasonry. Apart from their being a reminder of the pillars of fire and of cloud, another Masonic tradition has evolved over the years in the belief that the pillars were used to store written records, presumably based on a description of the pillars being hollow, as given in Jeremiah c52 v21. This tradition is found in Rituals as far back as the beginning of the nineteenth century, as exemplified in the Finch Masonic Treatise (1802). The relevant portion of the Catechism reads:

Question: Were they cast hollow or solid?

Answer: Hollow.

Question: Why so?

Answer: The better to serve as Archives to Masonry, and to hold the Constitutional Rolls.

This explanation has also been preserved in Emulation, thus further accentuating a long standing belief in the supposedly organized state of Freemasonry at the time of the building of King Solomon's Temple.

This also reflects a tradition, faithfully and quite literally preserved in Lodge La Cesaree, No. 590 - an English Lodge in St. Helier working in French, where it is said that 'when the Warrant is to be shown to the candidate, it is produced from the interior of an ornate pillar,' an obvious reminder of the Legend of The Hollow Pillars.

Special significance is also given to one of the Pillars in the Second Degree, when we speak of K.S.T. and a pillar which was named after an Assistant High Priest ... who officiated at its dedication.

Another relatively recent practice is to top the two pillars with spherical balls on which are delineated maps of the celestial and terrestrial Globes, and thus Masonry Universal, and also perhaps an oblique reference to the Seven Liberal Arts and Sciences, taken from the Legend of the Antediluvian Pillars.

In conclusion I feel obliged to point out that, apart from their undoubted value in portraying the moral and spiritual lessons of the Craft, the foregoing examples of imaginative allegory have no solid basis in fact. The reason the analogies are not considered entirely exact are briefly as follows:

1. In reality there were not two separate pillars (one of Fire and one of Cloud) but one pillar only; a pillar which appeared to be cloud when viewed in the light of day but which turned fiery in the darkness of night, Exodus 14:20.
2. As to the pillars being formed hollow, 'to serve as archives to Freemasonry', for therein were deposited the constitutional rolls. There was not Freemasonry then, and there were no rolls.
3. The pillar Jachin appears in 1 Kings, 7:21 and again in II Chron. 3:17 and it was named, according to custom in Bible lands with a commemorative name, which means 'He (God) will establish.' Neither the pillar nor its name had anything to do with the wrongly styled Assistant High Priest. The two pillars were completed and named before the dedication of the Temple, and each of the names chosen was intended to express Solomon's gratitude to the Almighty. The Masonic use of the name belongs strictly to the pillar alone.
4. Lastly, the celestial and terrestrial globes, now generally found on top of the pillars, are perhaps a mistaken allusion to the 'pommels' referred to in the Chronicles described of the Pillar Chapters, which were believed to have been spherical or at least ovoid in shape. At all events, they could not have been delineated with celestial or terrestrial maps, the spherical shape of the world was unknown at that time. The Jews of Solomon's time, like the Babylonians, believed in the flat shape of the earth.

Bibliography: King Solomon's Temple in the Masonic Tradition: Alex Home; The Freemason At Work: Harry Carr; A.O.O. Vol. XXI; National Geographic Vol. 85, 1944: Dr. Nelson Glueck.