Working Tools

by

W. Bro. **B.H. Siddle**, P.G.S., Chaplain

From a study of the written histories of the development of the world, it would be safe, surely, to conclude that the greatest contributing factor to its progress, would have been brought about by the ability of Man to make, and to use, with his extremely dexterous fingers, Working Tools.

These range from the crude early types, which will be referred to later, to verge on the ultimate in sophistication. It would seem therefore, that it was a most fitting thing that in the first Book of Constitutions, those of Dr. Anderson, published in 1723, Working Tools received mention as being of quite some importance to Speculative Masonry.

We all know that Speculative Masonry emerged from the Operative, and so Working Tools are basic to Masonic philosophy, and accordingly should ever hold a revered place in its ceremonies. It would be difficult indeed, ever to imagine a member of the Craft forgetting his instruction in their moral values.

It can be very faithfully said, that the world's peoples could never assess the debt they owe to Working Tools, from the period of the flints to the Space-age.

To a zoological student there are two important categories into which Man enters. Firstly, Homo Sapiens, or ":thinking man", and secondly that he belongs to the order of Primates, or that he possesses a gift of outstanding proficiency in the use of his fingers as well as his brains. The dexterity of his fingers is simply marvellous. There are other categories as well to which he belongs, such as Homo Erectus -- or that he walks erectly – that he belongs to the vertebrates, or in other words he possess an internal skeleton, and also that he belongs to the class known as the Mammal -- all vertebrates who suckle their young. The Mammal class is extremely extensive, reaching as it does from the platypus and whale, right through to Man. For the purpose of this Paper, however, I would restrict my comments to the confines of Homo Sapiens, Primates and to Man's religious inclinations.

It seems that the first working tools were made of flint, and were of the order of knives, scrapers for the removal of flesh from animal furs and hides, and axe varieties, and included arrow and spear points. Here, then, we have the beginnings of Homo Habilis (or man the tool-maker).

After man's mastery of fire and his discovery of metals, tools soon became one of the keys to the door of knowledge. With the blending of the knowledge of the use of these two came metallurgy, and its co-partner clay tablet and brick baking. We know from the history of the very first civilisation – that of the Sumerians -- that these people knew how to alloy copper and tin to produce bronze, and it was here too, where golden objects are recorded as having first appeared. I think too, that for the purpose of the record, it should be noted that the Sumerians were the inventors (or discoverers) of the wheel.

Authority states that the first was the potter's wheel with which they made fine pottery, which they baked in ovens and glazed most beautifully. It may be of interest to note also, that from the clay tablets found in excavations at Sumer, it was here that writing was first invented -- in cuneiform -- a wedge-shaped lettering written on a pad of soft clay and placed in a clay envelope and baked after both had been dusted with brick dust to stop adhesion. Some 500 to 600 of these have been unearthed at Sumer.

The lettering is thought to have been done by means of a stylus, which we may term an office type working tool.

Is it too much, Brethren, to suggest that the above may have been the early seed of our mailing system? (The written message contained in the envelope?).

Here then we have the first ingredients of writing -- the stylus, a type of pen, and cuneiform to supply the message. Later followed all kinds of advice: "the pen is mightier than the sword" or perhaps as J. Taylor observes, "there's no wound deeper than a pen can give, it makes men living dead, and dead men live".

It is also known that the Sumerians used the wheel as a means of transport, surely a great contribution to the growing list of working tools, and further to this they also knew the circle contained 360 degrees. A profound discovery indeed, when we see in our lifetimes the vast list not only of working tools, but instruments for geometrical use, for astronomy, for surveying -- why the list is limitless which followed in its wake.

To quote one instrument which is looked at by possibly all of us the world over on numerous occasions each day -- the clock, or wrist watch -- and which are a part of the Sumerian sexigesimal arithmetic, or computation by sixties (i.e.) seconds, minutes, etc. There seems proof also, that these people discovered the square (or the fourth part of a circle), as excavations there have unearthed rectangular buildings of early origin. As the Sumerians irrefutably discovered the wheel, surely it would be logical to conclude that the compasses would also be their discovery (or at least the prototype), as these would be essential to their striking a circle.

It would seem, from the excavations, carried our at Ur in Southern Mesopotamia by Sir Leonard Woolley in 1926, and his discovery of the now famous Royal tombs, that working tools must have very quickly reached quite a high standard, and to have covered a rather large range. From some of the extensive collections of magnificent gold and silver ornaments unearthed here, the advancement in the tool-making and in the skill in their use were rapid indeed.

The chisel seems to have made its appearance at the time of the world's first master stone builders -- the Egyptians --- before the era of the iron age, and were made of bronze. Very reliable evidence has been found to verify this, as several First Dynasty Royal graves have been uncovered shooing workmen who have been buried with their tools of trade, in the Royal tombs with their rulers. The type of hammer which they used to strike the head of the chisel, was a ball of granite-like stone named diorite.

The arrival of the Iron Age was an event which took place at various parts of the world at various times. It is probably of considerable interest to Masonic students, to know that history dates the union of the Hebrew people under Saul, David and Solomon, between the years 1020-922 B.C. and authority dates the Iron Age of Syro-Palestine as 1000 B.C. The Iron Age did not arrive in Egypt until 700 B.C.

It would seem from the development of Egyptian type tools -- the try-square for use on the blocks of stone in the quarries, the chisels, the plumb-bob, as well as their use of rollers and sledges -- we inherited the nucleus of quite a number of present-day working tools.

Until 700 B.C. bronze was their tool metal, which would have been quite satisfactory so far as the Egyptians were concerned, as they worked mainly in limestone (a fairly soft sort of stone), and one which they were able to cut with a type of saw they used which was copper.

The Egyptians put ramps to considerable use, up and down which they dragged the prepared blocks of limestone and marble, on sledges composed of two side runners of timber with short sturdy timbers used crosswise at intervals, somewhat like the rungs of a ladder, and dove-tailed into the runners. Here, then, could have been the birth of the very strong method of timber-jointing known to us all today, dovetailling .

One cannot but wonder at the tremendous difficulties which were met and overcome by these people, during the pyramid building period. Let us just consider a single structure in this group, and the equipment they had and used. The Great Pyramid. It is about 450 feet high, 755 feet each way on the base-line, and covers an area of 12 ½ acres. The average weight per stone is assessed at 2½ tons, and the total weight is estimated at 6¼ million tons. What a blessing the use of iron (or steel) , tools would have been for these wonderful people!

It is considered by authority, that the use of iron in any great quantity and to numerous purposes, was brought about by the Etruscans, so that to these peoples goes the credit of the mass use of iron, the poor man s metal , as it was termed.

It is thought that the Etruscans originated in Lydia, an ancient country in Asia Minor, who migrated to Etruria on the western side of Italy.

Ancient Etruria is roughly in that part of Italy known to us today as Tuscany. Reliable sources state that iron was in use in the area at the time of their arrival, but to no great extent.

This, then, was the beginning of one of the world s greatest stages of development -- the mass use of iron in tool-making, and the natural sequence of events which this complemented -- from tools of trade to war weapons, armour and the commencement of the steel industry as we know it today. This ranges from surgeon s scalpels to space equipment, and just what this encompasses may well be outside even the limits of the computer, as the most modern computer can only answer information fed to it, and how could this ever be supplied or even guessed at?

Whether we care to recognise the fact or not, be they tools of trade, space instruments or implements, surgical or mechanical devices, in the final analysis they all add up to the same thing. A rose is a rose by any other name . They are all tools which have each helped to make the world a greater place to dwell in.

And so the real progression from iron to the superb types of steel as we know them today was about to begin.

There was in Africa from quite olden times a system of low-type steel production which is known to have existed. This was brought about by combining carbon and iron. Finds have been made in the Olduvai Gorge area, and tests place their production away back into antiquity. The region is in Tanganyika.

Of course the V.S.L. is by far the first real authoritative source to mention iron, and this reference is made in the Book of Genesis, Ch. 4 v. 22: and Zillah, she also bare Tubal-Cain, an instructor of every artificer of iron and brass . The iron referred to, is considered to be meteoric iron.

It would be readily conceded, I would think, that when Speculative Masonry was emerging from the Operative, was during a period when Royal power was secondary to Papal authority. The Holy See possessed infinitely greater say in the important issues of the times, than did the Throne. Then, too, we know that the great scholarship was, in the main, with the ecclesiastics, and so it was a very natural follow-on that the communion of the brilliantly minded monks with the masons, during the periods of the construction of the cathedrals, monasteries, abbey, etc. would profoundly affect the thoughts of the masons, because they constantly worked side by side, and were generally in the company of each other. Also many years were occupied in the building of these edifices, so the monks and the masons were, indeed in an enduring partnership. There is little need to wonder then, that the Masonic philosophy was one termed: a system of morality veiled in allegory, and illustrated by symbols . The moralising of the tools is quite easily understood when we remember the many Biblical references to the plummet, plumb-line, compasses, etc. used in parable or allegory.

As an operative mason myself, I well remember the first occasion, as an Entered apprentice, being asked to pass a master mason his Bible, and after a search I asked him where his Bible was. He pointed to his plumb-rule. I asked him why he called it a Bible and he gruffly replied, because it never tells a lie . Actually this is not always strictly true with plumb-rules, as from time to time (as they are made from timber), they wear a little either at the tip or the bottom, in which case, as soon as this is discovered. They are immediately paralleled off the centre line and trued up again. It may be of interest to know that many of the building contractors, world-wide, as well as in this city, actually supplied each mason on his being employed, with a plumb-rule, so as to be sure the plumb-rule was absolutely true.

One of the symbols of Masonry which is used as a Past Master s jewel, the Pythagorean theorem, is used on countless occasions in the building industry every day. We know that the geometrical definition of the theorem of Pythagoras states: the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides . In building parlance, this is known as the 3-4-5 method, or 6-8-10 and so on.

As is readily seen, from the intersection of two given lines, the three feet is marked on one line and the four feet on the other line, and the five feet is measured by steel tape across the hypotenuse, thus establishing a right angle. This is a quick method of determining a square corner.

Strongly highlighted even today, and ever likely to be so in the building industry, is one of the ancient landmarks of the Order -- the survey peg.

In olden days this was a source of constant trouble. The marker used at this time was a pile of stones, which was often shifted, either by flood or by evil design. Today this does not incur any great trouble, and is as surely immovable as the fixed stars. As I make this reference to Astronomy, I am also reminded that it is always advantageous to us to remember well, that although science has given us such great navigational instruments, we still steer our course by the stars.

Contrary to general belief, the plumb-rule is not always used for work on a vertical face. It is and always has been used for construction of work of a tapered or battered face. For instance, if in a wall to be used for retaining purposes, or perhaps an industrial chimney stack, say 96 feet high, the amount of taper of batter is 8 inches, a plumb-rule is made exactly 6 feet in length. The side are then tapered, so that the tip of the rule is a half-inch wider than is the bottom of the rule, off the centre line It will be seen then, that when the plumb-bob swings dead centre down the centre line, the wall at the top of the six feet, is tapered back a half an inch from the vertical. In a height of 96 feet (sixteen lengths of the plumb-rule), the amount of taper is eight inches. Notice, however, that the plumb-line is still vertical, it is the side of the plumb-rule which is tapered and provides the end product. This particular type of plumb-type is referred to in the parlance of Operative Masons as a better-plumb-rule.

A final illustration of this. We all know from the description of the loges , of the olden days, on the construction sites of the cathedrals, abbeys, etc., that hospitality played a most important part, because these works were sometimes great distances apart. If, therefore, there were no jobs available, they were given at least temporary lodgings, and refreshment enough to carry them to the next place of work. It is quite apparent then, that the mason was at times something of an itinerant. The hospitality is reflected quite substantially in today s refectory proceedings in Speculative Masonry. So, too, is there today, the carry-over of the travelling or itinerant mason to be found, because a mason who does not enter the category of a master mason, is referred to as a journey-man .

It would seem logical too, to equate the olden days Entered apprentice with the Indentured apprentice of today, as his indenture papers enter him into a contract with his employer for the term of his apprenticeship.

It may be of interest, too, to note, that the word refectory applied in its beginnings to a building or perhaps an annexe type of hall set aside in the monasteries or abbeys, etc., for the partaking of a frugal meal. This word is considered by some authorities to have come into our language through the Crusader contacts of old.

And so in closing Brethren, I feel it can be truly said, that working tools have not only been the means of shaping this world, and to a very great extent, its destiny, but have now begun with the advent of the Space-age, to have made a start on the moon as well, in the placing on its surface of the working tools of the scientist-scientific instruments.

Who then could possible assess the indebtedness the peoples of this world owe to WORKING TOOLS?

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