The dimensions and stability of Noah's ark

The Stability of the Ark

The book of Genesis in *The Bible* provides us with a straightforward and trustworthy historical account of the profound events of Noah's Flood. Here we find that the fanciful accretions of other Flood traditions are conspicuously lacking. Take, for instance, the dimensions of the Ark given in Genesis chapter 6 verse 15:

> `And this is the fashion which thou shalt make it of: The length of the ark shall be three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits.'

There is some degree of doubt regarding the precise length of the Biblical cubit, although most scholars seem to favour a length of around 1.5 feet (18 inches). Assuming the cubit to have been 1.5 feet, the Biblical Ark would have been 45 feet high, 75 feet in width, and 450 feet in length. Giannone (1975) has shown that the ratios of these dimensions are comparable with those of modern ships. In striking contrast to the cubic ark of the Babylonian Flood legend, the Biblical dimensions describe a structure of exceptional stability in water.

Preliminary calculations regarding the stability of the Ark were performed by Dr Henry Morris (1971). Additional work by a naval architect, David Collins (1977), has built on these calculations by taking into account the adverse weather conditions which the Ark would have encountered.

To estimate the stability of the Ark, one must first determine its draft. The draft is the height that the water comes to along the side of the vessel, measured from its bottom. Dr Morris' calculations assumed a draft of 15 cubits (22.5 feet), which was the depth of the Flood waters over the highest mountains *The Bible* (Genesis chapter 7 verse 20). However, Collins calculated the draft by estimating the weight of the Ark - for which he gives a figure of 7240 long tons [1]. From this, he estimated that the centre of weight would have been approximately 18.5 feet above the bottom of the Ark, and he derived a draft of 7.5 feet. A smaller draft gives a less stable vessel, and Collins points out that in ship design it is standard practice to adopt the lower estimate.

Using these assumptions, Collins looked at four important features of stability, in order to see whether the Ark would have been stable when subjected to upsetting forces such as wind and waves. Since the distance from the waterline to the bottom of the door was quite large in Noah's Ark, and because it had a relatively low centre of gravity, the primary capsizing force would have been the wind. Collins found that even in 210 knot winds - three times hurricane force - the Ark was extremely stable when his four major stability features were examined. These features were as follows:

1. **The angle of steady heel under the influence of the forceacting to overturn the ship**
2. Heel is the action of tipping sideways from an upright position. In this respect, the Ark proved to be better than most modern ships.
3. **The range of positive stability**
4. This demonstrates how far the Ark could roll without capsizing. Again, the Ark proved to be superior to modern shipping.
5. **The residual dynamic stability**
6. This represents the work required, in addition to the effects of the overturning moment2, to capsize the vessel. The Ark proved to be far in excess of the minimum stability requirements.
7. **The relative magnitudes of the maximum moment to right theship and the moment to overturn it**
8. This is essentially a safety factor, taking into account any minor variations in the assumptions, such as weight, draft, or centre of weight. Collins shows that the Ark had a more than sufficient margin between the maximum righting moment and the maximum overturning moment.

Collins concluded from his calculations that `Noah's Ark was extremely stable, more stable, in fact, than modern shipping. This is primarily because in modern shipping the extra margin of stability is sacrificed for attaining higher speed and more maneuverability′ (p.86). These mathematical studies show that the Biblical account of the Flood is a reasonable one, and act to confirm our faith in the veracity of the Scriptural record.

Paul Garner (1994)

FOOTNOTES

1. A long ton is a unit of mass equal to 2240 pounds or 1016 kilogram (approx).
2. Moment is a measure of the tendency to produce rotation, especially about a point or axis.

REFERENCES

Collins, D.H. 1977. Was Noah's Ark stable? *Creation Research Society Quarterly***14**:83-7.
Giannone, R. 1975. A comparison of the Ark with modern ships. *Creation Research Society Quarterly*. **12**:53.
Morris, H.M. 1971. The Ark of Noah. *Creation Research Society Quarterly*. **8**:142-4.

BCS will be pleased to receive your comments on our site.
Please e-mail us at BCS e-mail us at BCS

Most recent modification was on 4 April, 2003