

## APPARENT LEARNING OF A COMPLICATED TASK BY AN ADULT HERMANN'S TORTOISE (*TESTUDO HERMANNI BOETTGERI*)

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ON 4 July 2001 an adult female Hermann's Tortoise was noticed in the *Geochelone sulcata* pen, which abuts on the Hermann's Tortoise pen. This had never happened previously. The tortoise was returned to its original pen and a check was made to try and find out how it had escaped.

Since the tortoises are microchipped, this individual was identifiable. Individual identification was also possible from its carapace colour pattern. Later on the same day it was discovered how the tortoise had escaped. When constructing tortoise pens only a low barrier is necessary but posts should be sited *outside* the pen so they cannot be utilised in escape attempts. As a result of a novel escape method used by one of my *sulcata* females, to be described elsewhere, the number of boards around their pen had been raised, and a new post to secure these placed in the Hermann's pen, which comprises three boards 8.5 cm high.

The method of escape used by the female Hermann's requires several separate actions to be taken sequentially by the tortoise. Having raised itself into a vertical position in this corner, the tortoise uses the slight ledge offered by the top of the first board as a right hind foot rest. There is no corresponding ledge for the left hind foot to use, nor are there ledges on the higher boards. From this position it can place its right front foot on the top board. However, in this position there is no possibility for it to gain enough purchase with its hind limbs to pull itself up and over. Furthermore, in order to do this it has to relinquish its foot support on the protruding edge of the first board. It manages by climbing the space between the right hand boards (green in photo) and the new unpainted post on the left, as a climber would tackle a rock chimney. It uses its limbs to brace its carapace against the post to prevent it falling back as it attempts to climb upwards by pushing with its rear legs. This is a much more complicated task for

a tortoise than it might appear due to its inflexible carapace. A mammal, for instance, would bend its back. In a tortoise, all the movement has to be undertaken by the legs. This situation is illustrated in Plate 1.

However, because of the extra board to the rear (unpainted in the photograph), having reached the position illustrated in Plate 1, it has to change position by rotating to the right to face the lower green boards. As it does this it loses the chimney bracing effect, as it is no longer able to wedge itself in (Plate 2). Nor at this stage does it always have a limb over the top of the green rail, although it does in Plate 2. In the position illustrated, it is still vulnerable to falling backwards as it has no secure hold with any limb. It has to gradually work itself upwards and forwards and only when it reaches the position in Plate 3 is it fairly certain of being able to propel itself forward so that it falls into the adjacent pen (tortoises are not put off by this fall of 26.5 cm).

In Plate 3 it has just managed to secure a toehold with the right rear limb on the top of the pen. It is able to push itself forward with the left rear limb and to some extent with the left forelimb which is now against the edge of the top unpainted board. These are a series of complicated steps all of which have to be carried out sequentially to effect escape. Having successfully escaped via this route and methodology this same female tortoise regularly returns to this spot and is found in various positions of the climb. It usually fails when it comes to the point where it loses the chimney effect and has to swing to the right, but this in no way deters it from further attempts. The large pen has three corners but it is never seen at the other two. It apparently remembers the location from which it made its escape. Due to the intricacy of the climb, it appears that it also remembers what it has to do in order to position itself for a successful escape attempt.



Plate 1.



Plate 2.



Plate 3.

Further back-up for this interpretation comes from the failure of other tortoises of a similar size which share the pen to escape. This is despite tortoises being great escapers, and naturally drawn to corners. Other tortoises are frequently seen erect against areas of the pen. Hence it is not merely a question of coming to a corner and trying to climb out, or arriving at this corner by chance and using purely trial and error techniques to escape. Yet further corroborative evidence comes from the fact that this female tortoise, as of the time of writing (19 June), has now escaped on two further occasions over the past fortnight, the latest successful escape being yesterday.

While it is not possible to prove conclusively that the complicated climbing manoeuvres have been learned, the evidence strongly inclines one to this view. An alternative explanation is that the tortoise remembers that it has escaped from this corner before, so devotes all its escape activity to this corner and from time to time successfully makes the correct manoeuvres purely by trial and error. The writer does not, however, consider this latter possibility to be likely on the basis of the evidence - particularly the fact that no other tortoise has managed this escape by trial and error.

Tortoises have a well-developed ability to learn and remember the local topography quickly. European Tortoises placed in a large new pen (14 x 11 m) which has a 30 cm wide access to warm, dry sleeping quarters, the entrance being hidden from most of the pen by an intervening 4 m long solid board fence, invariably learn their way home on day one. Such topographical memory clearly has survival value for tortoises which go out to forage in the wild but need to be able to find their way back to a regular secure sleeping place.

Reptiles are able to learn rapidly by experience. More than 30 years ago the writer described single instance learning in a group of juvenile wild Saltwater Crocodiles (*Crocodylus porosus*) (Bustard, 1968).

#### REFERENCE

Bustard, H. Robert. (1968). Rapid learning in wild crocodiles (*Crocodylus porosus*). *Herpetologica* 24, 173-175.