

### III. HISTORY OF THE DISCOVERY OF THE FOSSIL ELEPHANT OF MALTA, WITH A DESCRIPTION OF THE FISSURE IN WHICH IT WAS ORIGINALLY FOUND.

By A. LEITH ADAMS, M.B., F.G.S., &c.

**A**BOUT Midsummer of the year 1857, when a quarry was being made in the soft calcareous sandstone in the district of Gandia, near the village of Micabba, Malta, one of the numerous fissures so common in all the formations of the two islands was observed to run in a straight line about E. and W. It was a simple vent, with several funnel-shaped expansions, and, as usual, was filled with red earth and stones. Among the *débris* of one of these expansions, several bones of large size attracted the attention of the workmen, and Dr. Speteri Agius, LL.D., a gentleman residing in the neighbourhood, having heard of the discovery, repaired to the spot, and picked up from among the exuvie a portion of a tooth and several fragments of bones, which he deposited in the Museum of the Maltese University. Shortly afterwards, a dispute between the proprietor and the lessee of the quarry put an end to the excavation, and the entire cavity was filled with rubbish, and levelled out into a field. In that condition it remained until reopened in June 1865.

Reverting to the above-mentioned remains found by Dr. Speteri Agius: these included a portion of an upper penultimate true molar of *Elephas Melitensis*, showing five disks of wear, the sixth plait fractured, and the remainder wanting; two heads of humeri; portions of shafts of a femur, humerus, and fragments of other bones.

In my memoir 'On the Maghlaq Cave and other Ossiferous Deposits found in Malta,' read at a meeting of the Royal Dublin Society, November 18th, 1861, I adverted to this discovery, and stated my reasons for considering the molar distinct from that of the mammoth, to which it was then erroneously considered to belong; surmising also, at the same time, that its characters more closely approximated to those of the African Elephant, in which sub-genus (*Loxodon*) it has since been placed by the late Dr. Falconer.

Such is the history of the discovery of this remarkable proboscidian. Three years afterwards (1859), a rich collection of the teeth and other remains of this elephant were collected by Captain Spratt, R.N., from the *débris* of a cave near the village of Zebbug, and forwarded to the late Dr. Falconer. Descriptive details of the cave and its exuvie were read by both gentlemen at the Cambridge Meeting of the British Association in 1862, when Dr. Falconer proclaimed the elephant to be a new species, and named it *Elephas Melitensis*. Further researches in caves, fissures, and alluvial deposits in Malta have resulted in disclosing many more remains of this elephant, which undoubtedly roamed (and at no very distant period) in vast herds over the area, with two species of *Hippopotamus*, a gigantic rat, birds of colossal dimensions, a lizard, and a land-turtle of an extraordinarily large size: at a time when the land-shells were identical with those now living on the island.

Having long desired to examine the spot where the first traces of the Maltese Elephant had been discovered, and after many unsuccessful attempts to overcome foolish prejudices,—by no means credit-

able to the native intelligence or learning,—permission was at last obtained through the kind intervention of His Excellency Sir Henry Storks, and the clearing out of the Gandia fissure was begun on the 14th June, 1865, at the expense of the Malta University, where the fossils obtained have been deposited. I was requested to superintend the excavations, and with the able assistance of my friends, Mr. Welch, 22nd Regiment, and Dr. Carruana, LL.D., secretary and curator to the College Museum, the entire *débris* was carefully examined, and the work completed in a few days.

The Gandia fissure was found to be a funnel-shaped hollow, 15 feet deep, and about  $9\frac{1}{2}$  feet in length at the entrance. The average thickness might have been originally from 4 to 5 feet; but as a portion of it had been removed with one of the sides of the fissure during the quarrying in 1857, the last measurement could not be ascertained with accuracy. Tracing the rent along the surface of the rock for upwards of 200 feet, it was found to be a vertical fissure, with the opposite sides almost in close apposition, excepting at the fossiliferous gap, and others of smaller dimensions, which were seen here and there along its course. The sides of the fissure were perfectly smooth, and coated with a thin layer of stalagmite, forming polished surfaces, doubtless resulting in part from friction of the opposing sides during oscillations of level, as can be clearly seen on many of the 'slips' and 'fissures' in numerous other quarries.

After the removal of the rubbish occupying the side of the fissure, which had been taken away in quarrying, a mass of red earth and stones, 8 feet in height by  $9\frac{1}{2}$  feet long, and from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  feet in thickness, was seen adhering to the remaining side of the fissure. The stones were all composed of the parent rock, and varied in size from a few inches to two or three feet in circumference, and were, for the most part, rounded and much decayed, from having been long in the red earth: others, however, had become hardened into a pale green limestone, by the absorption of water charged with carbonate of lime—an occurrence common to fragments of this rock that have been exposed to the slow percolation of lime-water in caves and elsewhere. Both stones and earth were firmly packed, as if by considerable pressure. From top to bottom, but perhaps more so near the former, were interspersed teeth and bones of the Maltese Elephant, indiscriminately with the bones of very large and smaller birds, and jaws, teeth, and bones of the *Myotis Melitensis*. No shells were found. The long bones of the quadrupeds and birds were all broken and in fragments, excepting those of the feet, which were usually entire. The elephants' teeth, although fractured in many cases, showed no traces of having been rolled; and from the perfect condition of their machærides and fangs, it was evident they had not been brought from a long distance. The same was observed with reference to the articulating surfaces of the birds' bones, which as a rule were also very entire. The perfect state of disorder in which the remains were found precluded the idea that the elephants, at least, had fallen into the fissure, but proved, on the contrary, that their remains, and those of the other animals, had been swept in by the agency of water. As further exemplifying this, it is worthy of



(3.) Broken fragments and plaits equal to about six teeth, chiefly belonging to adolescent and aged individuals.

*b. Tusks.*

1. Fragment of a tip,  $3\frac{1}{2}$  in. in length, perfectly straight; greatest circumference,  $2\frac{7}{10}$  inches.

2. Portion of a curved central part of the tusk, length 6 in. by  $6\frac{3}{10}$  inches in circumference.

*c. Skull.*

1. Fragments showing diploë.

2. Portion of right lower ramus, with tooth *in situ*, of a very young individual. The tooth is well worn, and indicates the second of the milk-series. The symphysial canal is wider in proportion than in *E. Africanus*, making the chin less pointed.

3. Mastoid processes of temporal bones of at least two adult individuals. This portion of the skull is common among the elephant remains I have found in other situations.

*d. Vertebral Column.*

1. One cervical vertebra.

2. Five dorsal ditto.

3. One caudal vertebra.

4. Numerous fragments of ribs.

*e. Upper Extremity.*

1. Two portions of scapula.

2. Four heads of humerus.

3. One inferior extremity of radius.

4. Two upper extremities of radius.

5. Seven carpal bones.

6. Eight metacarpal bones.

*f. Lower Extremity.*

1. Two portions of os innominatum.

2. Two inferior extremities of tibia.

3. Five tarsal bones.

4. Six metatarsal bones.

*g.* Thirteen phalangeal bones.

*h.* Three sesamoid bones.

*i.* Numerous fragments of long and flat bones.

II. MYOXIS MELITENSIS.

*a.* Two lower jaws and teeth.

*b.* One tibia.

III. BIRDS' BONES.

Not determined; several of large dimensions with long shafts, possibly belonging to *Grallæ* and *Anseres* of enormous size. The breadth across the lower condyles of the femur and humerus in many average respectively  $1\frac{2}{10}$  inches.

N.B. This last includes also the remains found by Dr. S. Agius.

IV. ON THE GEOLOGY OF HOBART TOWN.

By THOMAS HARRISON, Esq.

THE island of Tasmania is connected, as it were, with the continent of Australia by two chains of islands, the lines of which are afterwards continued in the mountain-systems both of Tasmania and Australia. The Tasmanian systems pass from north to south in a strangely zigzag course, throughout which the mineralogical cha-

enabled to take its measurements before it was partially destroyed in removing the matrix. The extreme length of the crown was  $8\frac{4}{10}$  inches; the length of surface in wear,  $6\frac{6}{10}$  inches; number of plaits, 10, and a talon ridge; number of disks of wear, 8.