

and curved line; a more vertical forehead, a greater flattening of the vertex and consequently a diminished height of the skull, with frequently, though not invariably, a greater breadth of the cranium in the region of the parietal eminences than near the squamous suture, have been regarded as characteristic of female skulls.<sup>1</sup>

A careful enquiry into these different characters will, without much difficulty, enable the craniologist to pronounce definitely as to the sex of a large proportion of the human crania which may be submitted to him for examination. But in large collections of skulls there are always specimens the characters of which are not sufficiently pronounced to enable one to state with certainty to which sex they had belonged. Various specimens of this kind have been distinguished in the tables which accompany this memoir by a query.

In determining several of the indices I have in many instances been saved the labour of calculation by employing the very useful tables which Professor Flower has appended to his catalogue of the human crania in the Museum of the Royal College of Surgeons of England.<sup>2</sup>

The determination of the internal or cubic capacity of the cranial cavity, so as to ensure accuracy and uniformity in result is admittedly one of the most difficult measurements to be undertaken by the craniographer. The amount of shot, or sand, or glass beads, or seeds of different kinds which a skull can contain varies, as has been pointed out, especially by M. Broca,<sup>3</sup> Dr. Wyman,<sup>4</sup> M. Topinard,<sup>5</sup> and Dr. E. Schmidt,<sup>6</sup> with the size of the particles, with the dimensions of the funnel through which they are poured into the cranial cavity, with the rapidity of their flow, and with the extent to which the skull is shaken and the particles made to subside and be compacted together. In a similar manner, the estimation of the amount of the material poured into a skull varies with the height of the cubic measure, with the rate at which the substance is poured into the measure, and with the amount of succession to which it is subjected. M. Broca strove to give uniformity to the gauging and cubage of a skull by always employing shot of a definite size (No. 8), by pouring it through a funnel, the neck of which had a narrow diameter, and by ramming the shot when in the skull so as to ensure the closest possible approximation of the particles. The shot was then emptied from the skull into measures of a definite height, with the aid of a funnel having a neck of a particular diameter.

<sup>1</sup> M. Broca's Instructions Craniologiques, already cited, and Prof. Ecker's article in *Archiv für Anthropologie*, Bd. i. p. 83, may be consulted with great advantage on the sexual characters of crania.

<sup>2</sup> Professor Welcker has also given in the *Archiv für Anthropologie*, Bd. iii. Heft 3, excellent tables for the determination of the indices of breadth and height.

<sup>3</sup> *Mém. de la Soc. d'Anthropologie de Paris*, sér. 2, t. i. p. 63, 1872, also t. ii. p. 1; and Instructions Craniologiques.

<sup>4</sup> Observations on Crania, *Proc. Boston Soc. Nat. Hist.*, vol. xi., April, 1868.

<sup>5</sup> *Anthropology*, English translation, p. 226, and more fully in *Revue d'Anthropologie*, t. v. p. 385, 1882. I wish to express my obligations to M. Paul Topinard for the interesting demonstration which he gave me of the mode of using M. Broca's method for obtaining the cubic capacity and the precautions which it is necessary to employ in order to avoid error.

<sup>6</sup> *Archiv für Anthropologie*, Bd. xiii. p. 53, 1882.