manner, and these teeth remain in wear simultaneously with the true molars; but in later forms no vertical succession takes place, and as the milk-molars are worn they are shed, being replaced from behind by the forward movement of the molars. Of these also the anterior may be shed, until at length in old individuals of the later types the last molar is alone functional. The gradual increase in the complexity of the proboscidean molars is one of their most striking characteristics. All stages can be traced between the simple, brachyodont, bilophodont (quadritubercular) molars of *Moeritherium* (Middle Eocene) to the extraordinarily complex type of tooth found in *Elephas*. Thus in *Palæomastodon* (Upper Eocene) the molars are trilophodont, and the same is true of the first and second molars of *Tetrabelodon* (Miocene), in which, however, the last molar is complicated by the addition of further transverse crests. In the Stegodonts of the Siwalik Hills (Pliocene) a further increase in the number and height of the crests takes place, and the whole crown of the tooth is more or less covered with a thick coat of cement. Still later, the transverse crests become highly compressed laminæ united by cement, and these are as many as twenty-seven in number in the Pleistocene *Elephas primigenius* and the recent *E. indicus*.

The evolution of the lower molars corresponds with that of the upper molars. Of the lower incisors the middle and outer pairs (Nos. 1 and 3) are soon lost, but the second pair remains functional for a long geological period. When the symphysis becomes shortened, these incisors are sometimes retained as vestiges (*e.g.*, in *Mastodon americanus*), but in the genus *Elephas* they have completely disappeared.

"A Comparative Study of the Grey and White Matter of the Motor Cell Groups, and of the Spinal Accessory Nerve, in the Spinal Cord of the Porpoise (*Phocæna communis*)." By David Hepburn, M.D., and David Waterston, M.A., M.D. Communicated by Sir Wm. Turner, F.R.S. Received January 23, —Read March 12, 1903.

(Abstract.)

Recent advances in our knowledge of the arrangement of the motor cells in the anterior cornua of the spinal cord of man have been made almost entirely by the study of the changes produced in these cells by the division or removal of limbs or parts of limbs in the human subject, and very little has, as yet, been done to elucidate this subject by the comparative method of investigation.

The authors considered it probable that much information might be obtained by the careful study of the cell groups in the spinal cord of a mammal differing markedly in its musculature from man, and as no previous observations on similar lines had been made in the same fulness on the spinal cord of any of the Cetacea, they describe the results of an examination of the cell groups in each segment of the cord of a member of this class, *Phocæna communis*. The investigation was carried out by obtaining a very recently captured specimen and at once preserving its tissues by injecting into its blood-vessels a solution of formalin, a method which has the advantage of preserving the natural configuration of the enlargements of the cord. A number of sections were prepared for the microscope by different methods from each segment of the whole cord, and typical sections were selected and photographed.

The principal features in which the musculature of the porpoise differs from that of man are the almost entire absence of a hind limb, the reduced musculature of the upper limb, and the possession of a large and flexible tail acted upon by powerful muscles, with some other differences noted in the text.

The segments of the cord giving origin to the nerves supplying these parts were compared with corresponding segments of the human cord. The groups of motor cells were found to be clearly differentiated from one another, and striking changes were found to occur in the shape of the grey matter and in the cell-groups as we passed from one segment of the cord to another, pointing clearly to a connection between the character of the part supplied with motor nerves from any segment, *e.g.*, limb, trunk muscles, genital muscles,—and the arrangement of the anterior horn cells in that segment.

The area of the grey matter and of the different columns of white matter was also determined at each segment.

The authors also describe some hitherto unrecorded features in the minute structure of the cord of this animal, especially the position of the nucleus of the spinal accessory nerve, and a detached mass of grey matter, probably corresponding to the vesicular column of Clark, in the lumbo-sacral region of the cord.