

a remarkable vertebral series extending from the 5th dorsal to the end of the tail: (1) The center of motion is the sacrum, where three vertebræ are completely coalesced to the summits of the spines, besides a fourth rib-bearing sacral with a free spine. The sacro-iliac union is by means of both ribs and neuropophysial plates. The presence of such plates in all the anterior caudals, as first described by the writer, proves that the sacrum is reenforced by additions from the anterior caudals. (2) There are more than thirty caudals and three distinct types of chevron, instead of the single type to which Marsh applied the generic name *Diplodocus*. The tail was undoubtedly a powerful swimming organ and also a lever by means of which the anterior portion of the body was elevated, the acetabulum serving as a fulcrum, while the trunk was immersed in water. This power did not exist upon land as in the Iguanodontia.

*The Ossicula Auditus of the Mammalia.* J. S. KINGSLEY and W. H. RUDDICH.

STUDIES on embryo pigs and rats show that the incus is the quadrate, the malleus, the proximal end of Meckel's cartilage. These cannot be homologized with the columellar chain of Sauropsida, since they are in front of the spiracular cleft and in front of the chorda tympani, while the columella is behind the spiracle and chorda tympani. The incus (quadrate) articulates with the stapes in the mammals, exactly as is the case in the urodeles. Nothing similar occurs in the Sauropsida. This is regarded as additional evidence that the mammals have had an amphibian ancestry. The quadrate cannot have disappeared in the glenoid fossa, as maintained by Albrecht and Cope, as this would involve a translation of parts impossible to explain. The mammalian lower jaw articulates by means of the dentary

rather than by means of the articularare, *i. e.*, its articulation is not homologous with that in lower groups. A longer summary of the paper will appear in the *American Naturalist* for March.

*Notes on Mammalian Embryology.* C. S. MINOT. (Read by title.)

*Professor O. van der Stricht's Researches on the Human Ovum.* C. S. MINOT. (Read by title.)

*Notes on the Morphology of the Chick Brain.* S. P. GAGE.

*A Specific Case of the Elimination of the Unfit.* H. C. BUMPUS.

THE results of a comparative study of one hundred and thirty-six English sparrows, which were rendered helpless or actually perished during the severe storm of February last, was numerically expressed, and it was shown that there was not only a measurable but a striking physical difference between the birds which actually succumbed and those which survived the storm. The birds which perished were longer, heavier, possessed of shorter heads, shorter leg bones, of less breadth of skull and of reduced sternum, while those which survived tended toward the possession of characters opposite to these.

While these average differences between the two groups of birds were emphasized, attention was also called to the fact that the individuals of extreme variability occurred most frequently among the birds which perished. The longest bird and the shortest bird in the entire collection perished. The same is true of the one having the greatest and the one having the least alar extent. The heaviest bird died; the one with the longest and the one with the shortest head died, and the one with the shortest humerus, the one with the longest femur, the one with the longest and the one with the shortest skull, and the one with the shortest keel to