

*On the development and morphology of the actual skeleton of vertebrates:* CHARLES S. MINOT.

The author reported observations upon the embryos of man and other mammals, of the chick, and of fishes, which demonstrate the existence of a continuous cartilaginous perichordal rod, for which the term *chondrostyle* is proposed. The chondrostyle is probably the primitive stage, out of which the chondrocranium is developed where there are no myotomes, and out of which vertebral arches, and later vertebral bodies are developed, where the myotomes are persistent.

*The arrangement of the mammary glands in litters of unborn pigs:* G. H. PARKER and C. BULLARD.

An examination of 1000 litters of unborn pigs showed that the numbers in the litters varied from one to fifteen, the most usual number being six. As there were in all 5970 pigs the average number per litter was 5.97. Of the 5970 pigs examined, 2947 were females and 3023 males, or for every 1000 females there were about 1026 males. In the males the nipples varied from nine to eighteen, the most usual number being twelve and the average 12.434. In the females the nipples varied from eight to eighteen, the most usual number being twelve and the average 11.908. Litters of eight or less would always find ample milk accommodations. Litters larger than eight might be too numerous for the best milk accommodations, and as the number of nipples is not significantly larger in litters of large size than in those of small size, this lack of adjustment must at times be realized.

*In abnormal carapace in the sculptured tortoise:* G. H. PARKER.

An abnormal carapace of the common sculptured turtle showed at the posterior end of the series of marginal scutes, both

right and left, two scutes in place of three, and in the middle of the carapace five bony segments in place of six. The variation in the bony segments is in mesodermic structures and lies anterior to the region of scute variation which is in ectodermic parts. As the ectoderm in tadpoles is known to migrate posteriorly over the mesoderm, it is possible that the same may occur in turtles and that the two regions of variation separated in the adult may have been in an earlier stage at the same transverse plane and induced by the same cause.

*The trigemino-facial ganglionic complex of Gadus and Amiurus:* C. JUDSON HERRICK.

The details of the composition of this complex as worked out by the author in *Menidia*, differ in some respects from those given by most other recent students of the cranial nerves of fishes. He accordingly, for purposes of control, worked out microscopically on Weigert sections the composition of the trigemino-facial complex in the cod-fish very fully and of the cat-fish somewhat less exhaustively. In both of these cases the results of this examination show very clearly that the plan of these nerves, and indeed of the peripheral nervous system as a whole, is fundamentally the same as in *Menidia*, with only unimportant variations in detail.

In *Gadus* and *Amiurus* the trigeminus is as in *Menidia*, save that the Gasserian ganglion is intra-cranial. In all of these types the facialis has three roots, motor, lateralis and communis, the latter being large in *Gadus* than in *Menidia*, and much larger still in *Amiurus*. In *Gadus* the geniculate or facial ganglion is crowded close to the Gasserian, yet clearly separable from it. It is intra-cranial and gives rise to the same nerves as in *Menidia*, except that it contributes nothing to the hyomandibular trunk and does contribute to the r. mandibularis V. The sympathetic system