

that much is heard even after both ears are stopped. (Ewald has just demonstrated on pigeons that after removal of the labyrinth they perceive sounds acutely; hence that the trunk of the auditory nerve possesses power of sound perception. Only after destruction of the trunk were the pigeons completely deaf.)

Kessel says that with open ears the head conduction plays an important rôle, and without it the localizing of a sound source would be far more uncertain than it is.

Diminishing the intensity of the sound until it was no longer perceived with closed ears, then opening the ears, was the plan adopted by Preyer. The decisions were very uncertain and incorrect. He considered the bone conduction from the meatus to be better than from other parts of the head, and hence this method only partly shut off factor of bone conduction.

Preyer wants more experiments in this series. It is likely that repeated practice would render better results. This is Preyer's theory, and there is no doubt something in it.

The chief fault I find is, that it is hard to believe that with errors of 180° in the median plane there can exist a special physiological mechanism for the appreciation of the direction of sound. This fault, however, may be simply due to lack of education of this special division of the organ of audition, this lack of education extending through generations.

Gruber, in 1869, expressed the opinion that the semicircular canals were not exclusively an organ of the sense of space, and was induced to believe that they were concerned rather in a participation of the hearing function. There can be no doubt, after Breuer's experiments and the results therefrom attained, that they are at any rate partially organs for the perception of our position in space and maintenance of our equilibrium, might they not be also organs for the proper projection of sound in space—organs for space perception in a double sense? Add to this the two factors of bone conduction and their existence as the main part of the hearing organ in fishes.

That the eyes assist in the appreciation of the direction of the sound there can be no doubt, and that they have filled up or