

operative extraction of the stapes with a view to improving the hearing. This opinion was based upon observations made by himself and others, and also upon a case which he had under his notice.

**ON THE POSSIBILITY OF RE-OPENING THE FENESTRA OVALIS
IN CASES OF OSSEOUS ANCHYLOSIS OF THE STAPEDO-
VESTIBULAR ARTICULATION (TYRIDIANOIXI OVALIS).**

BY PROFESSOR G. FARACI (University of Palermo).

In 1895 I wished to study experimentally the effects on animals of fracture of the stapes and laying open the fenestra ovalis, in order to see what truth there was in the statements of Schwartz and Politzer, who maintained, and perhaps still maintain, that the entrance of small osseous fragments into the vestibule determined a purulent labyrinthitis, with the possible sequence of meningitis.

I do not discuss here the operative technique necessary in various animals, nor do I desire to set out in all their details the individual operations which have been minutely described in my book,* but confine myself to a statement of the conclusions at which I have arrived :

1. Opening the fenestra ovalis with fracture of the base of the stapes is not a dangerous operation, and if no infection accompanies the procedure, there is never purulent labyrinthitis nor any functional disorder.

2. The osseous fragments which fall into the vestibule provoke only a slight inflammatory reaction, with formation of connective tissue, which encapsules the fragments without compromising the structure or functions of the soft parts in the vestibule.

3. Notwithstanding the greater gravity of the surgical trauma compared with that in stapedectomy, one may observe, as a sequel to the operation, the formation of a delicate membrane which replaces the stapes and has sufficient acoustic power.

4. The resulting auditory power does not differ from that observed in animals after total ablation of the stapes.

5. This operation may be recommended in man when marked deafness is accompanied by serious noises.

From these conclusions I determined to perform the operation on the human subject as soon as the opportunity should present itself.

* "Chirurgia dell' orecchio medio ed esame critico delle conseguenze dei vari atti operativi relativamente alla facoltà uditiva" ("Studio Clinico Sperimentale." Roma, 1895).

Recently I operated in the case of a girl, aged fifteen, who, in consequence of chronic suppuration from infancy in the left ear, had entirely lost her hearing, and who suffered from very loud noises and intercurrent attacks of vertigo.

On examination I found the patient heard the watch only in contact with the ear. She did not hear the tuning-forks C¹ or C² nor whispered speech. Rinné was negative, and Galton's whistle was heard only from 5 upwards. The other ear was normal. The objective examination showed: Destruction of the membrane, retraction of the manubrium with fixation to the promontory, and the mucous membrane of the tympanum changed into cicatricial tissue. The vertical process of the incus could not be seen; the fossa ovalis was filled with new-formed connective tissue which completely covered the stapes.

On November 24, 1898, I detached the manubrium, and extracted it, together with the incus to which it was anchylosed. I removed the fibrous tissue in the fossa ovalis, and found that the stapes was firmly anchylosed, so that it was impossible to stir it. I made then a small opening in the base of the stapes, and penetrated to the vestibule. After the operation the patient had a little vertigo, which passed off in half an hour. Hearing tests resulted as follows: Watch $\frac{30}{200}$, whispered speech 0.40, Galton from 4 upwards, C fork $\frac{20}{50}$. After eight days the hearing power diminished, but returned and improved after a month, and now ten months after the operation the result is as follows: Watch 0.40, whispered speech 3 metres, C $\frac{10}{50}$, C¹ $\frac{20}{50}$, Galton 4. The vertigo entirely ceased and the noises were much better.

The result could not be more satisfactory, both from the acoustic and functional point of view, and if it is considered that this is a full confirmation of my numerous experiments on animals, it cannot be denied that it is of great importance. It shows us that the operation, notwithstanding the slight injury to which the soft parts in the vestibule are exposed, and the activity of the histological processes that take place there, gives rise to no disturbances of equilibrium and produces no abnormal stimulation of the special elements of the auditory nerve. On the contrary, both the vertigo and the subjective noises can be mitigated, and even be caused to disappear, as has happened in the case operated on by me.

I believe the statement completely justifiable, that *tyridianoisri ovalis* is an operation which is not only practicable in man, but

also advisable whenever the sound-perceiving apparatus remains normal, and when on account of serious pathological conditions of the stapedo-vestibular articulation stapedectomy is impossible.

The histological preparation which accompanied this paper represented a section of the vestibular cavity of the internal ear of a rabbit on which *tyridianoixi oralis* had been performed. In the place of the absent stapes was a newly-formed connective tissue, the vestibular membranes preserving their normal structure. Two little fragments of the destroyed stapes having fallen into the vestibule, had become encapsuled by connective tissue, which formed a sort of cross-piece in the anterior part of the cavity of the vestibule. It is interesting to note that the animal never showed any disturbance of equilibrium during the six months it remained under observation, and preserved a moderate hearing power.

JAMES DONELAN (*trans.*).

THE PNEUMATIC TREATMENT OF DISEASES OF THE EAR.

BY DR. G. NUVOLI (Rome).

In order to get, he said, as clear an idea as possible of the pneumatic treatment, as practised by means of the electric-motor ear-pump, he had made an anatomical study of the effects of the treatment on the auditory organ of a dead body. By means of this pump the air in the external auditory canal was condensed and rarefied with rapid alternations, and the tympanum was consequently propelled either inwards or outwards in such a way as to take a very rapid regular movement, which might repeat itself two or three hundred times a minute without any disturbance or injury. The whole action of the audotympanic movement might be observed through apertures made in the roof or sides of the cavity of the tympanum. Whilst the handle of the hammer was propelled outward, the head was propelled inwards, and *vice versâ*, the whole of the small bone turning on a horizontal axis placed exactly above the small apophysis. The horizontal portion of the articular surface of the anvil is struck vertically by the corresponding articular surface of the head of the hammer; the anvil, however, sliding, transformed this vertical movement into a horizontal one. The whole movement becomes greater if the tendon of the tensor tympani be cut, whereas if this muscle be laid bare and stretched, the curvature of the membrane was increased, and the movements produced by the pump became most limited. By means of the frontal mirror, let the eye be fixed on some luminous point in the outline of the stirrup, and provided the anatomical piece be normal,