

A similar mode of proceeding is generally adopted in the case of indifferent substances. But it is evident that the detail of the considerations must vary greatly with the nature of the several substances. Frequently, however, it happens, that the exact circumstances under which indifferent substances are generated are unknown, and that they are likewise deficient in yielding products of decomposition possessed of salient properties. In such cases, we have still a means of controlling the formula as established by analysis, provided the substance be volatile. This control consists in the determination of the specific gravity or the density of the vapour which substances form at high temperatures. Now, as this control is very frequently adopted, even in cases in which we are by no means reduced to this last resource, and as both the considerations which it involves and the mode of experimenting, are particularly interesting, I will, before concluding these remarks upon formulae, direct your attention briefly to this subject in the next Lecture.

ARTIFICIAL TYMPANIC MEMBRANES.

By Joseph Toynbee, Esq., F.R.S.

[At a meeting of the Pathological Society].

Mr. Toynbee said, that certain experiments and dissections, which he performed during the past year, had convinced him that the guttural orifice of the Eustachian tube was closed, except during deglutition, and he was subsequently led to infer, that, for the function of hearing to be perfectly performed, it was requisite that the tympanum should be a closed cavity, being convinced that, if it were not so, the sonorous undulations would not strike the tympanum with sufficient force. He determined, therefore, to close entirely, by artificial means, the next case of perforated tympanum that presented itself, and did so with great success; and, since that he had employed an artificial membrane with great benefit in between thirty and forty cases. He, Mr. Toynbee, had used thin layers of vulcanised India rubber or gutta percha, to construct the artificial membrane; to the centre of one of the surfaces of this membrane he attached a fine wire or stem of some other material, by means of which the septum would be passed down and adjusted. Mr. Toynbee employed this treatment, first in the case of a man aged 43, who had been discharged from the army for deafness. In each membrana tympani was an aperture between one and two lines in diameter, and the mucous membrane of the tympanum was thicker and redder than natural, and discharged freely. Blisters behind the ears and astringent injections were prescribed, and a slight improvement followed. The man's hearing, however, still remained very defective, so that he was unable to follow any useful pursuit. At the commencement of last June, therefore, Mr. Toynbee placed in the left ear a very delicate layer of vulcanised India-rubber. When it was properly adjusted, the patient observed, that he heard more clearly than he had done for years. Ever since that time, this patient had worn the artificial membranes, and with them and he could hear almost as well as any other person; but when they were removed, he could not hear words spoken in a low voice. The man was then introduced, and the artificial membranes having been removed, the members of the Society had the opportunity of observing the perforate condition of the membrana tympani. After the removal of the membranes, he could not hear unless loudly spoken to, but when he had replaced them, which he did with apparent readiness, his hearing was excellent.

[A conversation ensued afterwards as to the necessity of an aperture existing in tympanum for the production of sonorous undulations. It was stated both by Mr. Brooke and Mr. Toynbee, that it had been established by the experiments of Müller and other enquirers, that such an aperture was necessary only for the formation of loud sounds, such as were produced by