

I was so impressed with the successful treatment of my patient that I went to see M. Zund-Burguet myself and received treatment, which benefited both my deafness and my tinnitus. I found that he was not a physician but a physicist, and had therefore attacked the problem of deafness at a different angle from the traditional one of the medical man. He had been led to do this because he had been engaged for some years in research work in acoustics and phonetics and while doing so had worked out a theory of deafness on which he founded his physiological system of treatment by the electrophonoid method which is at once rational and scientific.

Zund-Burguet came to the conclusion—as Urbanschtsch had suggested some years before—that the best way to get the deaf to hear was to *re-educate* the ears with the sound of the human voice, which gives a physiological stimulus not included in any of the ordinary medical or surgical methods of treatment. Urbanschtsch had attempted to use human voices but his method was found to be impracticable. Zund-Burguet wished to reproduce as far as possible the same kind and number of vibrations as are contained in the whole range of human voices, bass, tenor, contralto, and soprano. After many experiments and disappointments he was able to overcome the inherent difficulties of the problem and get constructed the instrument he calls the "Electrophone." I show you the instrument here and anyone who desires to use it will find full direction how to do so in my book—"The Treatment of Chronic Deafness."*

This instrument reproduces the sound vibrations of the whole gamut of the human voice and thus gives the requisite physiological stimulus to the ear.

The first treatment is usually followed by the diminution and even by the disappearance of the feeling of fulness in the head, of which the deaf, especially those suffering from otosclerosis, so often complain.

The local effect of the treatment on different parts of the ear may be seen by the operator and felt by the patient. The meatus begins to show signs of wax although no wax may have been secreted for many years as in otosclerosis, that means that the treatment is stimulating the ceruminous or wax secreting glands to resume their function. The operator may also see on examining the drum through the speculum immediately after a treatment that the drum is red and hyperæmic which shows that the circulation is being stimulated and fresh blood is being brought to *all* parts of the ear, as fresh blood cannot be brought to the outer ear without being brought to the middle and inner ear as well, thus nourishing parts that may be beginning to atrophy. This increased circulation in the drum is also most effective in healing a perforation. The patient will often feel the tickling sensation caused by the induced current passing down the Eustachian tubes into the throat at the back of the soft palate. This stimulates the cilia lining the tube and causes them to act more vigorously and so get rid of the catarrhal secretion in the middle ear and prevent it stagnating around the ossicles and setting up a diffuse fibrosis which as we have seen the late Sir W. Milligan said had so far baffled all attempts to prevent.

The treatment has the disadvantage that it is not possible to tell by any preliminary tests whether it will be successful or not. There is a factor in deafness as yet unrecognised, the presence of which, or it may be the absence of which, determines the result. It may be, as has been suggested that this is the functional element present in many cases of deafness. The usual course of treatment consists of thirty sittings but on account of this

unknown factor it is necessary to give a preliminary course of twelve treatments; if there be considerable improvement, it is worth while giving a full course, if there be no improvement it is not. The improvement must be considered in relation to normal hearing, and not merely in relation to the amount of hearing the patient had previously; for instance, if a patient hear the ordinary voice at 6 inches or a foot, and that distance be increased to 1 or 2 feet, even though the improvement be 100 per cent. or more, it still leaves the patient, for all useful purposes, as deaf as before; and the improvement is, in reality, negligible, and it is useless to go on. It must not be forgotten that this is an endeavour to treat a chronic and progressive disease which has baffled all the ordinary classical methods of treatment and which must without treatment inevitably become worse. In order to maintain the improvement a further course of treatment may be necessary from time to time.

Let me now give the results which I have obtained up to the present time in the treatment of what would be regarded as hopeless cases. Of 665 cases treated by me 187 were affected with nerve deafness, 261 chronic otitis media and 217 with otosclerosis.

665 Cases.

Nerve deafness	...	...	...	187
Chronic Otitis Media	...	...	...	261
Otosclerosis	...	...	...	217

Results.

Nerve deafness	...	...	138 or 73.8% improved.
			49—no appreciable improvement.
Chronic Otitis Media	...	...	174 or 66.6% improved.
			87—no appreciable improvement.
Otosclerosis	...	...	117 or 53.9% improved.
			100—no appreciable improvement.
TOTAL	...	...	449 cases—64.5% improved.
			236 cases—no appreciable improvement.

Let us now consider tinnitus or noises in the head which is the positive evil afflicting so many of the deaf. The noises as a rule begin after the patient has become conscious of his deafness and are referred either to both ears or to one. For this reason it would be better to refer to them as noises in the ears. The noises may accompany any type of deafness and were formerly supposed to be always associated with oto-sclerosis but it is now known that a patient may be suffering from oto-sclerosis and yet have no noises but this is rare. When the noises begin some weeks or months before the deafness is noticed and when they are referred to the head and not to the ears this is generally looked upon as a sign that the patient is suffering from otosclerosis in an early stage and that deafness will follow. Before coming to a definite conclusion the blood pressure should be taken, because, sometimes, when it is very high or even very low the alteration of the pressure within the skull produces the noises, which may cease when the pressure is brought back to the normal. Except for the few cases caused by altered blood pressure we do not know why the noises occur. They are not uncommon at the menopause in association with the headaches, flushings and other well known phenomena occurring at that period of life. No treatment has been suggested except dosing with bromides and hydrobromic acid to try and lessen the sensibility of the brain but these do not give much if any relief. The most effectual method of treatment is by means of the Electrophone. Although this treatment merely alleviates deafness it in many cases not only alleviates the tinnitus but in addition removed it altogether. Out of the total of 665 patients who suffered from deafness 230 of them complained also of tinnitus.

*"The Treatment of Chronic Deafness by the Electrophonoid Method of Zund-Burguet." By George C. Cathcart, M.A., M.D. The Oxford Medical Publications, 2nd Edition.

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