into general use there will be need for caution over dosage, otherwise ill effects such as menstrual disturbances, endometrial hyperplasia, and post-menopausal bleeding, as well as toxic reactions such as nausea and vomiting, will be commonly seen.

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MÉNIÈRE'S SYNDROME

SUCCESSFUL TREATMENT BY SURGERY ON THE SYMPATHETIC

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Ménière first described his syndrome in 1861, but had inadequate knowledge of the underlying aetiology. He reported a case of a patient who died after an acute illness of five days, and described the necropsy findings; it would seem that acute haemorrhagic labyrinthitis was the cause of the syndrome.

By definition Ménière's syndrome is a malady characterized by attacks of rotational vertigo accompanied by a tendency to fall, occurring at irregular intervals and associated with tinnitus and progressive nerve deafness. The attacks are sudden in onset and may occur without warning, and if severe the patient may fall to the ground with great violence. Commonly there is an associated vomiting, which may be of varying severity, sometimes lasting for hours to the point of exhaustion. Accompanying these vestibular disturbances are degrees of cochlear involvement the symptoms of which are tinnitus and nerve deafness. At first the nerve deafness is mild and occurs only with the attacks, but in the later stages of the syndrome it becomes progressively worse and is manifest permanently between the attacks, until finally it is complete on the side affected.

In the earlier stages the patient is free from giddiness between the attacks, but with progression of the syndrome

there is a constant state of dizziness, which is considerably accentuated by any sudden movement of the head.

The tinnitus is variable in type and severity; it may be a pulsating throbbing variety or a high-pitched constant note either singing or hissing in character. There is no known precipitating factor, and the absence of premonitory signs makes the attacks the more distressing, the patient developing a constant dread of the next occurrence; thus a not inconsiderable functional element quite often exists with the syndrome—a fact recorded by Levy, O'Leary, and Furstenberg—and great care has to be paid to detail in the examination in order to determine the degrees of organic and functional symptoms.

Aetiology

Much confusion exists about the exact aetiology of Ménière's syndrome, as evidenced by the considerable volume of literature on the subject and the extreme diversity of views expressed—some substantiated by necropsy findings and pathological investigations, some based purely on clinical observation and empirical therapy, and others founded very largely on assumption. Attributable factors in the literature cover such a wide field as poisoning from lead, mercury, arsenic in alcohol, drugs such as salicylates, circulatory disturbances of hypertension, arteriosclerosis, anaemia, the exanthemata, the chronic infections, syphilis and tuberculosis, virus infections, chronic diseases such as leukaemia, purpura, and pernicious anaemia, tumours of the cerebello-pontine angle, and trauma.

Causative theories are equally diverse, ranging from disturbance of sodium metabolism in the local tissues (Furstenberg) to vascular disturbances. The latter Miles Atkinson describes as the "mechanics" of Ménière's syndrome, and the patients are divided into two groups determined by an intradermal histamine test—a vasoconstrictor group and a vasodilator group, in the ratio of five to one. He then treats them accordingly with nicotinic acid or histamine.

Hallpike and Cairns noted at necropsy a distension of the endolymphatic system, with degenerative changes in the organ.

Anatomical Consideration

The blood supply of the inner ear is derived from two sources. The first, of major significance, is the internal auditory artery, which, as is common knowledge, is a branch of the anterior inferior cerebellar artery; or, less commonly, it may arise direct from the lower part of the basilar artery. This in turn is formed by the union of the vertebral arteries at the base of the skull.

The subsequent course of the internal auditory artery is through the internal auditory meatus, accompanying the auditory and facial nerves to its distribution near the inner ear. This distribution would seem to take various forms according to Nabeya, ranging from an almost equal dichotomous division into cochlear and vestibular arteries to a predominant cochlear artery with smaller branches to the vestibule and vice versa, or a vestibular artery dividing to send branches to both cochlear and vestibule. Siebenmann describes the blood supply as a more or less equal division of the internal auditory artery to both cochlear and vestibular fields of distribution. It would seem that the variability of the distribution of the arteries indicated by Nabeya might well account for the variable degree of association of cochlear and vestibular signs in Ménière's syndrome-complex. This would reasonably fit in with the view held by us that the predominant aetiological factor is one of vasoconstriction, and that the smaller vascular distribution to a particular portion of the organ will imbue

that artery, by virtue of its size, with greater vasoconstrictor properties—hence a preponderance of symptomatology of the organ of distribution.

The second source of blood supply to the inner ear arises from vessels of the middle ear. This is said, however, to be a somewhat rare source, and need hardly be considered as presenting a possible fallacy in the rationale of treatment.

Bergglas found around such vessels as the iliac arteries large nerve strands at the union of the adventitial and muscular coats. He believed that this plexus extended throughout the muscular tree and was everywhere continuous.

H. H. Woollard states that vascular tone from the aorta to the periphery is maintained by vasomotor nerves in two ways. First, in the aorta large bundles from adjacent sympathetic ganglia composed almost entirely of non-medullated nerve fibres pass into the adventitia, some lying superficial and some deep near the media. The bundles continue to the periphery, forming a plexus of non-medullated fibres from which further fibres pass inwards and form an abundant mesh of the finest fibres within the muscle coat. Secondly, from the peripheral nerves these fibres are almost entirely medullated. The muscular coat is innervated by the fine network, the individual elements of which divide and fuse together to give absolute continuity complete throughout the vascular wall. Physiologically, Langley, Bayliss, and Gaskell have shown that bars of constrictor fibres are exclusively sympathetic ganglionic and that there is no other source of supply.

Hence destruction of the cell station in the stellate ganglion and blocking of the post-ganglionic pathways to the auditory vessels would presumably deal with the problem if the vasoconstriction is of central origin, for it is yet to be seen whether sensitization of sympathetic nerve endings to adrenaline or adrenaline-like bodies occurs in the terminal branches of the internal auditory artery after removal of the stellate ganglion. This destruction is undertaken by ganglionectomy and stripping and cutting the vertebral artery. It was felt that cutting the artery was necessary because of the possibility of impulses being conveyed through the intramural plexuses, a number of which exist, as shown by H. H. Woollard, at varying depths in the arterial wall. Also Leriche's periarterial sympathectomies never proved effective, the spasm returning to the vessels from days to weeks after the operation, hence indicating the probable existence of alternative pathways. Woollard showed that the nerve supply of arteries came from two sources—the one from periarterial fibres, and the other from neighbouring nerves. The fibres from neighbouring nerves were myelinated and probably not of vasoconstrictor function, so that the failure of Leriche's operation would seem to be due to the establishment of the pathway again, probably through the arterial wall itself.

That after ganglionectomy and cutting of the artery there is the possibility of sympathetic impulses reaching the vessel from the opposite vertebral artery via the circle of Willis, or alternatively from the component of Oort of the eighth nerve, has not been overlooked, but to the best of our knowledge no evidence in support of these sources is known. It is conceivable that primary nerve deafness may also be due to vasoconstriction, since the deafness is part of the syndrome, the possibility in these cases being that the effect of the spasm is felt by the artery of supply to the eighth nerve, with subsequent permanent damage. It was with this in view that a few cases of early pure nerve deafness were selected for operation, and research in this field is being continued.

In the absence of definite pathological evidence it would seem that vasoconstriction plays a predominant part in the production of the syndrome. Siebenmann points out that

the internal auditory artery which supplies the labyrinth may be readily influenced by excitation of the vasoconstrictors on account of the narrowness of the artery relative to the basilar artery. Its state of contraction depends upon the nerve plexus surrounding the vertebral artery and its branches coming from the thoracic part of the sympathetic cord and inferior cervical ganglion. It was with this in view that a means to prevent the flow of impulses through the plexus was attempted.

The Operation

Under intratracheal gas-oxygen with positive pressure the anterior approach is favoured, with the patient in a supine position and the head extended and rotated to the opposite side. This serves to bring the transverse process of the seventh cervical vertebra into prominence. Through a 2-in. (5-cm.) slightly curved incision dissection of the subclavian triangle is carried out down to the deep fascia of the neck. The clavicular head of the sternocleidomastoid muscle is divided $\frac{1}{2}$ in. (1.25 cm.) above its clavicular origin. The phrenic nerve is then isolated and retracted out of the way. The scalenus muscle is divided and the second part of the subclavian artery is then seen. Careful dissection brings into view the thyroid axis, and if the dissection is carried anteriorly the vertebral artery is exposed. It is sometimes a help to divide the inferior thyroid artery between ligatures. When this is done the vertebral artery becomes more accessible, and its adventitious coat may then be stripped from the origin of the artery until it enters the foramen in the transverse process of the sixth cervical vertebra. This artery is larger than one might expect, often being twice the diameter of the inferior thyroid artery. It arises from the upper and back portion of the subclavian artery, and its exposure may be facilitated by retracting the subclavian artery downwards and forwards. In the areolar tissues surrounding the artery may be found sympathetic branches from the stellate ganglion, which it crosses. The vertebral artery is freed and then divided between ligatures. Careful dissection is made through Sibson's fascia, and the parietal pleura is stripped downwards as far as the transverse process of the second thoracic vertebra. This brings into view the pre-ganglionic fibres of T.1 and T.2 as they ascend to blend with the inferior cervical ganglion to form the stellate ganglion, the variations and branches of which are notorious. This ganglion is freed from its surrounding loose fatty areolar tissue and excised after dividing the pre-ganglionic fibres of T.1 and T.2. Several small veins in this tissue may sometimes cause temporary and troublesome oozing if torn. The wound is then closed in layers. Only six days' stay in hospital is necessary.

Immediate Result of the Operation

Horner's syndrome is of course apparent at once. The contracted pupil and ptosis of the upper eyelid rarely worry the patient after the first few days and tend to correct themselves during the first few months. However, should the ptosis persist a small plastic operation is all that is required to raise it. The dryness of the hand does not cause discomfort.

Ear.—Patients state that the head feels clearer and that they no longer have the sense of uneasiness or feeling of pressure in and around the ear that Ménière's syndrome produces, and the ear loses its stuffed-up feeling. The effect on the tinnitus is varied. In Cases 4, 5, and 9 it was completely relieved, in six cases it was partly alleviated, while in the remaining three it was unaltered. The hearing shows immediate improvement, which has been maintained for the time those cases have been under observation.

It is well known that Ménière's syndrome often affects one ear after the other. We have not yet had the

condition occur in the ear of the unoperated side, but, if it should, then there is no valid reason why the stellate ganglion of that side should not be removed, together with stripping and possible ligation of the vertebral artery, though the safety of this latter procedure should first be proved by animal experimentation. This mode of treatment has been so effective that it suggests the possibility of successfully alleviating an acute attack of Ménière's disease by means of a "novocain" block of the stellate ganglion—a relatively simple procedure.

Nose.—Some dryness of the mucosa is observed, but this is not maintained for more than a few weeks.

Throat.—Nothing observed.

Taste and smell remain unaltered, and there is no appreciable effect on salivation.

Complications.—The disturbance of circulation through the vertebral artery might conceivably give rise to thrombosis of the post-inferior cerebellar artery in arteriosclerosis. This would then result in degenerative changes in the dorso-lateral area of the medulla, probably involving the dorsal and ventral spinocerebellar tracts, the spinal tract and nucleus of V, the lateral spinothalamic tract and nucleus ambiguus, and even the vestibular nerve. However, since the original syndrome may be caused by the arteriosclerosis, operation is not undertaken in these cases, and therefore the complication is hardly likely to occur.

Case Reports

Reports of twelve cases operated on during the last twelve months are given. The routine clinical examinations, including calorie tests and inflation of eustachian tubes, were carried out. Calorie tests showed normal variations that are encountered with labyrinthine dysfunction due to Ménière's syndrome. In all cases the eustachian tubes were patent. Audiometric examination was made of all ears, and records of both air and bone conduction were taken, but for the sake of brevity only air-conduction records are published. Wherever the air conduction was improved there was a corresponding improvement in the bone conduction.

Case 1.—A married woman aged 46 had had severe attacks of giddiness for seven months—she fell four times in one week. Attacks occurred every two or three days, starting with great roaring in the left ear and completely prostrating her for 24 to 48 hours. Severe deafness and tinnitus involved both ears. There was no great improvement on salt-free diet and sedation for three months. There was a history of previous middle-ear disease (right ear), but this had now cleared up.

On July 1, 1947, left stelletomy, with division of pre-ganglionic fibres of T.1 and T.2 and division of fibres going to vertebral artery, was carried out. There was immediate relief of vertigo and tinnitus (pulsating tinnitus completely relieved); though an occasional high-pitched note was present. Hearing was greatly improved for both air and bone conduction.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	60	70	90	90	100	—
" " June 1, 1948	..	45	45	60	70	65	80

Case 2.—A man aged 25 had a sudden onset of vertigo in December, 1946, accompanied by severe tinnitus in the right ear and vomiting, and was confined to bed for three weeks. Further attacks from January to March, 1947, were accompanied by increasing deafness. He was then free until June, when attacks restarted. Tinnitus had persisted since the first attack, and was of the continuous type. In June, 1947, he was given a salt-free diet, with sedation, restricted fluids, and injection of calcium: no improvement resulted in either giddiness or tinnitus. He had also had migraine since boyhood.

Operation (July 1, 1947): right stelletomy and stripping of vertebral artery. Result: except for a slight attack of giddiness

on Sept. 2, accompanied by tinnitus in the left ear, there has been no further attack; the hearing has very much improved and the tinnitus, while still present, has greatly lessened, and he has had no further attack of migraine to date.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	55	60	65	55	75	—
" " June 7, 1948	..	30	30	25	20	45	65

It is highly probable that the slight attack on Sept. 2 was due to Ménière's syndrome affecting the other ear.

Case 3.—A woman aged 21 underwent a fenestration operation for clinical otosclerosis (by E.R.G.P.) on the left ear on Aug. 20, 1946, with a satisfactory result. On June 16, 1947, she began to complain of an increase in the tinnitus of the right ear, accompanied by severe attacks of vertigo and vomiting. It was decided that the fenestrated ear was not responsible for the syndrome. Cocainization of the speno-palatine ganglion on the right side completely relieved the tinnitus for several hours.

Right stelletomy was performed on Aug. 14, and next day the head was clear and the noises had ceased. Up to May 29, 1948, no further attacks of giddiness had occurred, but slight tinnitus of a continuous character had returned: the tinnitus could be stopped by biting hard on a piece of cork between the right upper and lower molars. The hearing has decidedly improved.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	35	30	40	35	45	55
" " June 8, 1948	..	20	20	25	15	35	50

Case 4.—A woman aged 32 had for 10 years had increasing deafness of nerve type, associated with severe tinnitus and bouts of vertigo, the latter symptom being present during the past three years and increasing in frequency and severity. Right stelletomy was performed on Aug. 15, 1947. Up to June 16, 1948, no further attack of vertigo had occurred, and there was complete cessation of tinnitus and great improvement of hearing.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	45	40	55	60	45	40
" " Post-op.	..	35	35	40	40	20	30

Case 5.—A man aged 65 had his left ear first affected in 1946; he had severe giddiness, vomiting, tinnitus, and increasing deafness with each attack. In 1947 the right ear started to be involved, with severe prostrating attacks. Tinnitus of continuous and pulsating types was present for 21 months. There had been no previous middle-ear disease.

On Aug. 29, 1947, right stelletomy, with division of pre-ganglionic fibres of T.1 and T.2 and sympathetic nerves going to vertebral artery, was carried out. On Sept. 1 there was no giddiness, no tinnitus in right ear, and the head felt clear. On March 31, 1948, the giddiness and tinnitus had gone and the hearing was greatly improved for both air and bone conduction.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	35	35	35	40	40	70
" " June 14, 1948	..	30	20	10	20	40	75

Case 6.—A male fitter aged 48 had a history of 2½ years' severe prostrating attacks of vertigo accompanied by vomiting, deafness, and tinnitus in the left ear. Tinnitus was of a continuous roaring nature. On Jan. 8, 1948, left-sided stelletomy was performed, with stripping of the vertebral artery. On April 22 there was no giddiness; the tinnitus was unaltered, but hearing had somewhat improved.

Cycles per Second :		128	256	512	1,024	2,048	4,096
Loss in decibels: Pre-op.	..	40	50	60	65	50	45
" " June 12, 1948	..	25	35	45	40	35	45

Case 7.—Two years ago a man aged 71 began to have severe attacks of giddiness which, despite all conservative treatment,

including nicotinic acid, continued until he was unwilling to leave the house. Hearing steadily deteriorated in the right ear, and was accompanied by a continuous high-pitched tinnitus, which became worse before an attack. In childhood the patient had had a suppurative otitis media.

On Feb. 2, 1947, right-sided stelletomy was carried out. By Jan. 24, 1948, the attacks had lessened, and he could walk even during an occasional mild feeling of unsteadiness. On Feb. 9 the noises were unaltered, but no attacks of giddiness now occurred. On May 3 he was playing golf for the first time since the onset of vertigo, and now drives his car without any apprehension.

Cycles per Second:		128	256	512	1,024	2,048	4,096
Loss in decibels:	Pre-op.	25	35	45	55	—	—
"	June 11, 1948	35	45	50	55	55	75

This case shows gradual improvement of the high frequencies.

Case 8.—A woman aged 53 had a history of shingles on the left side of the face accompanied by severe attacks of giddiness, which came on usually while she was sitting quietly and was aggravated by stooping. Nerve deafness was present in the left ear. There was tinnitus, both pulsating and continuous.

On Feb. 5, 1948, left stelletomy was done, with stripping of the vertebral artery. On March 2 there was no further vertigo; the head felt clearer, and the left side of the nose, which was always blocked, especially at night, was free. This nasal obstruction was not complained of before the operation, and unfortunately no particular note was made of the condition of the nasal mucosa on the left side, though now it appears less congested than the right side. The tinnitus is unaltered.

Cycles per Second:		128	256	512	1,024	2,048	4,096
Loss in decibels:	Pre-op.	20	25	35	35	45	60
"	May 22, 1948	25	25	30	20	25	50

Case 9.—Six years ago this patient, a woman aged 41, had vertigo on and off for one year, with increasing deafness of the left ear associated with a continuous low buzzing sound. Two years ago vertigo restarted with deafness and tinnitus in the right ear. Rest, salt-free diet, and sedation brought about considerable improvement in the vertigo, deafness, and tinnitus, but symptoms recurred immediately this treatment was stopped. It was considered advisable to try to save the remaining hearing in the right ear, so sympathectomy was decided upon.

On March 15, 1948, right stelletomy was performed, with division of the pre-ganglionic fibres of T.1 and T.2, and stripping and ligation of the vertebral artery. There was an immediate cessation of vertigo and a clearer feeling in the head. Tinnitus had ceased and a great improvement had occurred in air and bone conduction.

Sept. 21, 1948. This patient had a recurrence of her vertigo and unsteadiness accompanied by tinnitus and deafness. The attack was very mild compared with her former attacks, but nevertheless was a definite one.

Cycles per Second:		128	256	512	1,024	2,048	4,096
Loss in decibels:	Pre-op.	35	40	50	50	40	30
"	June 16, 1948	10	20	10	15	15	25

Case 10.—A woman aged 33 had an 18-months history of slowly increasing nerve deafness and tinnitus in the right ear accompanied by bouts of severe vertigo with nausea and vomiting, each attack leaving the hearing worse than before. Right-sided headache and deep mastoid pain of a shooting character were also present. She had undergone conservative treatment for nine months, together with repeated eustachian inflation, without improvement. For a period of five weeks noises were greatly reduced. The patient felt more comfortable, and the sensation of pressure in the region of the right ear had lessened.

Cycles per Second:		128	256	512	1,024	2,048	4,096
Loss in decibels:	Pre-op.	25	35	35	35	20	25
"	June 14, 1948	20	30	35	15	20	30

On April 31, 1948, right stelletomy with division of the vertebral artery was performed. When examined on June 14 there was no further giddiness, and she said her head felt clearer than it had since deafness began. Hearing had improved, but the tinnitus had only slightly lessened.

Case 11.—This patient, a woman aged 63, gave a history of sudden onset of very severe attacks of vertigo accompanied by deafness and tinnitus during the past 16 months. The tinnitus was like faintly escaping steam, and the deafness had been much worse during the last four weeks. She was very apprehensive of further attacks. Sedation and calcium tried over a three-months period gave no relief.

Right stelletomy and ligation of vertebral artery were carried out on May 17, 1948, and by June 14 there was no giddiness whatsoever. She then led a normal active life and did her household work. The head felt clearer, but she complained of slight pain and weakness of the right forearm. This was rapidly lessening. Tinnitus was still present, but was decreasing. The hearing had not appreciably altered.

Cycles per Second:		128	256	512	1,024	2,048	4,096
Loss in decibels:	Pre-op.	50	45	45	50	30	60
"	June 14, 1948	50	45	50	50	25	45

Case 12.—In 1934 this patient, aged 38, had her first attack of giddiness, with tinnitus in the left ear. She was free of further attacks until 1946, but they had been present on and off ever since. When attacks were severe they were accompanied by vomiting and an increase in the tinnitus in the right ear. The hearing of the left ear had remained practically stationary since 1934, but that of the right ear steadily decreased with each subsequent attack. As she had a history of three miscarriages a Wassermann test was done, and this proved negative. The tinnitus was worse at the beginning of an attack and faded off altogether for a few hours after the vomiting had ceased. The noises were relieved to a soft murmur by cocainization of the pheno-palatine ganglion of the right side.

On May 14, 1948, right stelletomy with division of vertebral artery was performed. On June 12 there was no giddiness, the tinnitus had lessened, but the deafness had not yet improved.

Pathological examination of the stellate ganglion was carried out in all cases, but no abnormality was discovered in any of them. This finding may be compared with that of J. W. Budd (quoted by Mogan and Baumgartner, 1945), who demonstrated definite pathological changes in the superior cervical ganglion in a case of Ménière's disease, as did J. W. Kernohan, of the Mayo Clinic. Details of the results are given in the accompanying table.

Details of Results

Case No.	Stellate Ganglion	Vertebral Artery	Vertigo	Tinnitus	Hearing
1	Excised	—	Relieved	Lessened	Improved
2	"	Stripped	"	"	"
3	"	—	"	"	"
4	"	—	"	Relieved	"
5	"	—	"	"	"
6	"	Stripped	"	Unaltered	"
7	"	—	"	"	"
8	"	—	"	"	"
9	"	Stripped and ligated	"	Relieved	"
10	"	"	"	Lessened	"
11	"	"	"	"	Stationary
12	"	"	"	"	"

* See report on Case 9.

Summary and Conclusions

A series of 12 cases of Ménière's syndrome which failed to respond to conservative treatment were subjected by one of us (E.R.G.P.) to stelletomy and division of the pre-ganglionic fibres of thoracic 1 and 2. In two cases the vertebral artery was stripped, while in four cases it was either ligated or divided after the adventitious coat had been removed. The reason for the latter process is given in the context. In each case the vertigo attributable to that ear has been completely relieved except in Case 9.

Whether the recurrence of vertigo in this case was due to hypersensitivity to adrenaline or adrenaline-like bodies following excision of the ganglion (for the patient was hard at work again and under considerable mental strain), or whether some sympathetic fibres to the ear may also originate on the opposite side to a greater or lesser extent in individual cases, is not known, but the fact that there has been a marked improvement on the administration of ergotamine would suggest that the former view is the more likely of the two, in which case division of the pre-ganglionic fibres together with stripping and ligation or division of the vertebral artery would be the operation of choice. This has now been done in more recent cases with the same beneficial result on the vertigo, added to which it has the advantage of avoiding a Horner's syndrome.

The result upon the tinnitus is apparently unpredictable, though on the whole it was reduced—in three cases it was completely relieved. The relief seems to be more pronounced with the pulsating type of tinnitus than with the continuous variety. Each patient suffered from concomitant nerve deafness, and in all except the last two most recent cases there has been improvement (in some ears very markedly) of hearing by both air and bone conduction. If the nerve deafness is very severe it is beyond relief.

It is felt that further work along these lines will greatly aid in elucidating the aetiology and pathology of this distressing complaint and its accompanying tinnitus and nerve deafness.

It is interesting to record that a further series of stelleotomies has been performed for tinnitus alone (to be published later), but we forbear to make further comment on the role of the sympathetic on tinnitus at this stage.

In the meantime a new surgical method of treating Ménière's syndrome, having tremendous advantages over the old surgical destruction of the internal ear, is at our disposal.

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"RHEUMATOID DISEASE" WITH JOINT AND PULMONARY MANIFESTATIONS

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It will be generally accepted that rheumatoid arthritis, like pulmonary tuberculosis, is a systemic disease with local manifestations, the former in the joints, the latter in the lungs. Moreover, its systemic nature may be manifested, as recent studies have shown, by widespread pathological changes in various tissues and organs.

Our own studies, confirming those of other observers (see Hench *et al.*, 1948), have shown that in certain cases the bones may exhibit atrophy and even widespread cystic changes, and the peripheral nerves may become involved, with resultant neuritic pains, paraesthesiae, and trophic changes. Biopsy studies of the muscles may reveal microscopic alterations in the form of perivascular lymphocytic infiltration and macrophages in the perimysium and endomysium akin to those sometimes seen in periarteritis nodosa and disseminated lupus. Cardiac lesions may also occur almost identical with those following rheumatic fever, while other accompanying lesions may be found in the spleen, liver, lymph glands, subcutaneous nodules, pleura, and even in the eye in the form of iritis and scleritis. In one recent case there was good reason for regarding a kidney lesion (Ellis type 2) as part of the rheumatoid process.

The purpose of this paper is to report three cases in which an accompanying pulmonary lesion appeared as an integral part of the "rheumatoid state." A careful search of the literature has not disclosed any earlier records.

Case 1

A fitter's mate aged 47 was admitted under the care of one of us (P.E.) to the Rheumatism Unit and later to the Leatherhead Emergency Hospital, and when first seen on Dec. 14, 1945, gave the following history. Two and a half years previously, while he was in a fair state of general health, pain and stiffness started in the right knee-joint. During the next few months the fingers, wrists, elbows, and left knee became involved. Swelling of the affected joints was present while active and subsided with rest. Until the time of admission he had had several courses of physiotherapy at different hospitals. He had lost 2 st. (12.7 kg.) in weight since the onset of the illness. There was a previous history of pleurisy progressing to empyema at 11 years of age, and malaria at 21 and 24 years. There was no significant family history.

On examination he was pale and toxic, and wasting involved subcutaneous tissues and muscles. Examination of the locomotor system revealed evidence of swelling of the proximal interphalangeal joints, wrists, elbows, and knees, and fibrous nodules were present over both olecranon processes, sacrum, and scalp. Examination of the lungs showed poor air entry, and breath sounds diminished at both bases, where numerous crepitant rales could be heard. The heart, abdomen, and central nervous system were normal. Blood pressure 130/90.

Pathological investigations showed: E.S.R., 56 mm. at first hour (Westergren); red cells, 3,670,000. Hb. 66%; C.I., 0.83; white cells, 8,000 (polymorphs 67%, lymphocytes 29%, monocytes 3%, eosinophils 1%); G.C.F.T., negative; serum uric acid, 1.2 mg. per 100 ml.; Mantoux, weak positive. Repeated sputum examinations, including concentration techniques, were all negative for tubercle bacilli. General bacteriological examination of the sputum was not significant. Fluid aspirated from the left knee-joint was purulent and contained many polymorphs, but was sterile on culture.

For the last two years 45 severely disabled men have been happily and gainfully employed at Haven Products, Ltd., a "sheltered workshop" on Clydeside. They work a regular 8-hour day five days a week and are paid a basic wage of 2s. 1½d. an hour plus bonuses. The Nuffield Provincial Hospitals Trust has recently published an illustrated pamphlet describing the development of the workshop and the work done there. The men manufacture electro-thermic quilts, and the machines are adapted to suit the needs of individual workers. Doors are made specially wide to allow invalid chairs to pass through, lavatories have railings fitted so that men who must use their hands to get about may be helped, and transport is organized from the workers' homes. Four travel to the workshop in motor-chairs and fifteen require ambulance transport. A medical advisory committee, consisting of consultants from the three large voluntary hospitals in Glasgow, a senior medical officer of the Ministry of Pensions, three almoners, and an observer from the Ministry of Labour, was set up to advise on the planning and equipment of the factory, to help in the selection of suitable disabled men, and to ensure that the men's disabilities were not aggravated by their work. The men are medically examined every year, but medical supervision is kept in the background so far as possible. The venture has been very successful both financially and as an experiment in the restoration of the men's self-confidence and contentment. Harmonious relationships prevail in the workshop, and the report emphasizes particularly the enthusiasm and the sense of corporate life enjoyed by the men. Copies may be obtained from the Nuffield Provincial Hospitals Trust, 12 and 13, Mecklenburgh Square, London, W.C.1, and 10, Duke Street, Edinburgh.