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## AURAL VERTIGO

### A CLINICAL STUDY

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FOR the sake of clarity, this paper is so arranged as to give first what the author believes to be a true picture of the condition under consideration. Some of the case histories from which this picture was evolved are given at the end, for reference if required.

The material for this paper consists of cases, seventy-three in number, which fulfilled the following two conditions :

- (1) The patient had consulted an aurist on account of vertigo.
- (2) Middle-ear suppuration was not present.

Of the seventy-three cases, the very great majority, namely sixty-six, conformed to the general description which I am now about to give. The remaining seven were oddments of known ætiology and a brief description of these will be found at the end of the paper (p. 111).

The clinical picture presented is as follows :

#### **Sex and Age**

Males predominated in the proportion of forty-two to thirty-one, the average age incidence being forty-seven years. Although the fully developed condition is not one which is met with in young people, on careful investigation of the history, evidence will frequently be obtained of some auditory disturbance dating back to early adult life. Only a few cases

## A. J. Wright

occur in old age, five of the present series being seventy years and over.

### **Onset of the Complaint**

The first symptom noted by the patient was, in more than half the cases, auditory and not vertiginous. Of the former (auditory) group, deafness was the initial symptom in one-third and tinnitus in the remaining two-thirds. Of the group in which auditory symptoms preceded the vertiginous, the interval which elapsed before the onset of vertigo was in all cases, with the exception of two, a period of months or years up to a maximum of thirty years.

### **Hearing**

As far as the affected ear was concerned, some loss of hearing existed in all the cases except two, but, in these two, a history of temporary deafness during the attacks was obtained. The degree of defect in the affected ear was as follows :—

Useful hearing, i.e. perception for the conversational voice at 6 feet and over, was present in rather less than half. Of the remainder, absolute deafness existed in nine and only a remnant of hearing persisted in a further twenty-eight cases.

In half the total cases, the hearing in the unaffected ear was normal, and, in the other half, there was a bilateral defect. Where the defect in hearing was bilateral, in eight cases it was extreme in degree, leaving no useful hearing.

Variability in the hearing was frequently met with, both according to the statement of the patient and to tests, a temporary depreciation preceding or coinciding with the attacks of vertigo. A history of paracusis, hyperacusis and diplacusis was not uncommonly noted, particularly in the early stages of the disorder and preceding the acute vertiginous attacks.

### **Type of Hearing Defect**

In regard to tone loss, where this was accurately recorded, the upper portion of the scale was lost in eighteen, the lower portion in nine, and in twelve the defect was for all tones.

### **Correlation of Hearing and Vertigo**

The degree of loss of hearing was not found to be a reliable guide in estimating the prognosis as to the duration of the

## Aural Vertigo

vertigo. Thus, in those cases in which the hearing had been entirely destroyed in the affected ear, in nine the vertigo still persisted and in only four had it ceased. Of those cases in which only a remnant of hearing remained, in eight the vertigo had ceased but in a like number it still persisted.

### Vertigo

With a few exceptions, the type of vertigo met with in the cases under review was severe in degree.

Excellent descriptions of the various types of aural vertigo exist in the literature, among which I may instance Mollison's at the Summer Meeting in 1935, and I certainly could not improve on these. I should, however, like to emphasize certain characteristics which seem to me of importance :

1. The great variability met with in the frequency, severity and duration of the attacks.
2. The frequent occurrence of a more or less constant unsteadiness between the typical acute attacks of vertigo.
3. The occasional occurrence of cases in which this constant type is the only one present.
4. The widespread nature of the upset produced throughout the vegetative nervous system. Thus, for example, abdominal discomfort and diarrhoea are not infrequent and may occur without vomiting, leading to errors in diagnosis.
5. While the subjects of this disorder are not drawn particularly from the neurotic type of individual, the complaint is, by its nature, so mentally disturbing and produces such a feeling of insecurity that it is only to be expected that some subjective giddiness should sometimes tend to persist, for a time at any rate, as a functional manifestation after the organic changes have ceased to progress either spontaneously or as a result of treatment.

### Tinnitus

This was present in all cases, with one exception. It was extremely variable both in incidence and nature, an increase in degree usually preceding the vertiginous attacks. In addition to the tinnitus, a sensation of numbness or fullness in the ears was frequent, and occasionally this amounted, in the patient's description, to an actual pain. These symptoms displayed the same type of variability as the defect in hearing and the tinnitus.

# A. J. Wright

## **The Membrane and Middle Ear**

The tympanic membrane on the affected side was normal in forty-eight cases. There was some degree of milky opacity in five, and in nine, more or less extensive post-suppurative cicatricial changes, with a dry perforation in three of these. In those cases with cicatricial changes, the minimum interval separating the onset of the vertiginous attacks from the previous suppuration was ten years. Three cases, all with normal tympanic membranes, showed bilateral hyperostoses, but they conformed in other respects to the general picture.

## **Eustachian Tubes**

The variation in hearing, alterations in sensation produced by inflation, and the effect of suggestion upon myself by the views of others, led me, in several cases, to suspect the existence of a pathological change in the eustachian tube. In no case, however, on critical examination, was this suspicion confirmed.

## **Focal Infective Lesions**

One or more foci of infection were noted in all cases. These foci consisted of infected teeth, tonsils, antra, gall-bladder and uterus. In one-third of the cases, more than one focus was noted. Dental, tonsillar and maxillary antral infections were observed in great preponderance and, curiously, in absolute numerical equality. Of the antral cases, it is interesting to note that the infection was bilateral in six, on the same side as the labyrinthine lesion in five, and on the opposite side in an equal number.

## **Lesions other than foci of infection**

These were such as are usually met with in association with a focal infection, namely: rheumatism, neuritis, acne of the face, nephritis and iritis, in that order of frequency.

## **Course and Duration of the Complaint**

This is infinitely variable. Long periods of partial or complete freedom from vertigo may occur, perhaps alternating with attacks of extreme severity, and this fact renders it very difficult to assess with certainty the results of treatment.

## Aural Vertigo

While the complaint is a progressive one, as evidenced by the defect in hearing, such progression may be spontaneously and permanently arrested at any stage. As has already been stated, the duration of the disease is very variable, being, in my cases, between the limits of two and thirty-nine years.

Although there is a temporary ebb and flow in the course of the disorder, I have not as yet met with a case in which spontaneous cure has taken place, i.e. the vertigo and tinnitus have ceased and the hearing has returned to normal.

### Conclusions

As a result of this review, I believe that we can recognize the picture of a *definite disease*. This picture, as seen by me, is of a chronic progressive lesion of the labyrinth, running a very irregular but long course and always producing some permanent damage, as evidenced by loss of hearing. Though spontaneous cure does not occur, the disease may be arrested at any stage. The disease does not result from a lesion in the middle ear but is primarily in the labyrinth. It is marked by an increased irritability of the labyrinth, as shown in (*a*) the cochlea, by hyperacusis; and in (*b*) the vestibule, by an abnormal reaction to normal stimuli such as movements of the head or to minimal abnormal stimuli such as some alteration of tension in the middle ear. The view that altered tension in the labyrinth accompanies the disease receives considerable support from the fact that lines of treatment, both medical and surgical, directed towards its readjustment, do alleviate the symptoms. In addition, focal infection is invariably present, and frequently other lesions such as we are wont to associate with such infection exist in the patient.

Is there any other disease presenting a similar clinical picture? I believe that we do find such a one in the case of chronic iritis. This complaint is also intermittently progressive, runs a long course, always leaves some permanent damage behind it and is also usually unilateral. It is accompanied by increased irritability as shown by hypersensitiveness to light and an increased tension in the eye, and measures designed to reduce the tension relieve the irritability and pain. Finally, the incidence of chronic iritis is roughly similar to that of the disease which we are considering. We can, however, in the case of iritis, actually observe the

## A. J. Wright

pathological process in the eye and appreciate that it is inflammatory.

The only interpretation that I can make, as a result of these observations, is that we are dealing with a chronic inflammatory lesion of the labyrinth, secondary to a focus of infection.

How far do the effects of the eradication of the infective foci in such cases support this hypothesis? My results are as follows:

All cases treated in this way, i.e. by eradication of a septic focus or foci, have been included and, with one exception which is mentioned below, they are all now completely free from vertigo. The total number is twenty-three, and of these, in ten what may be described as a cure resulted, i.e. both the cessation of the vertigo and the return of the hearing to the normal. In a further three the vertigo ceased and some improvement took place in the hearing. In nine the vertigo ceased but the hearing remained unaltered. In one case the period of time since the operation is too short (four months) to estimate the final result, but there has been a progressive diminution of the attacks, with none for the last two weeks, and the hearing has returned to the normal.

I feel that although the number of cases is small, in view of the fact that all are included and that the results are so uniform, one must regard them as whole-heartedly supporting my hypothesis.

To sum up:

I believe that cases of labyrinthine vertigo which have been regarded as of unknown or doubtful ætiology can all be grouped together as belonging to a single disease which I venture to call "Focal Labyrinthitis". This disease, I suggest, is an inflammation of the labyrinth. I base this view on the occurrence of nerve irritation, both auditory and vestibular, signs of tension and progressive loss of function, and on the analogy with a known inflammatory lesion, chronic iritis. It is not, in my opinion, the result of disease in the middle ear. That it is secondary to a focus of infection is shown by the invariable presence of such focus and, to a greater degree, by the arrest or even cure of the disease when such focus is eradicated. Finally, this is, I believe, the only hypothesis which will be found to explain the many isolated observations in the literature which do not fit into our present somewhat indefinite ideas of its pathology.

# Aural Vertigo

## Illustrative Cases

The two cases detailed below are given for the following reasons : They present rather typical pictures of the disease ; they are similar ; they were both seen by several otologists, all of whom presumed the existence of a middle-ear lesion, without, in my opinion, any adequate evidence ; and finally, the second of the two cases was never seen by myself, so that the observations quoted are entirely independent of any views which I may hold.

Mrs. S. G. was first seen by me fourteen years ago at the age of 29. She gave a history of an attack of pain in the left cheek with a discharge from the left side of the nose about a year previously, lasting over some weeks. She came to me complaining of a feeling of stuffiness in the right ear of some weeks' duration, with stabs of pain, autophonia and hyperacusis. She was musical and the chief reason for her consulting me was that one tone high in the scale was heard a semitone flat. Her hearing for my conversational voice was normal, but she had lost all tones, as tested with tuning forks, from 16 to 512 inclusive. The tympanic membranes were normal. Her tonsils were somewhat large and injected, but I regret to say that I did not apparently investigate thoroughly the possibility of an antral sinusitis, although this was suggested by the history. At that time, there was no vertigo and my provisional diagnosis was right Eustachian catarrh. Inflation seemed to make her more comfortable.

I next saw her ten months later, when she stated that the previous symptoms had cleared up for nine months but that for the last three months she had had intermittent attacks of deafness, distortion of sounds, etc., and some slight giddiness. Examination then disclosed no defect in hearing and the tympanic membranes were still normal.

I did not see her again until four years later, when she stated that she had been getting progressively worse ever since I had last seen her, particularly in regard to the distortion in hearing. The loss of the lower part of the scale still existed but she had now, in addition, lost the fork 1024. Rather moist entry was noted with an eustachian catheter, and, as a result of inflation, her hearing for the conversational voice improved from 2 feet to 4 feet. I advised her to consult Mr. Mollison, and he has kindly allowed me to include this extract from his record :—" I saw her in May, 1928, and she

## A. J. Wright

gave the history of being 'very sensitive to noises and certain notes' though she is 'somewhat deaf'. Some notes were heard as much as four notes higher in the right than left ear. I failed to inflate the right tube even after using a bougie. She complained of slight vertigo lately. She had the signs of right-sided conduction deafness, raised lower tone limit, Rinne  $\pm$ , Monocord normal. Only 25 per cent. hearing in right ear, left normal."

I next saw her fifteen months later, when the hearing in the affected ear for my conversational voice was still 4 feet. I suggested a course of inflation and that it might be advisable to remove her tonsils. Her condition remained much the same until two years later, when she had the first acute attack of vertigo while out hunting. This was followed by another after a short interval, which was accompanied by vomiting and was so severe that she could not ride home.

For the next two years the attacks became progressively more severe and frequent until eventually she was having two or three daily. The hearing in the affected ear became progressively worse with an intense pulsating swishing tinnitus. Her tonsils had been removed at some time shortly after the onset of the acute vertigo. The acute vertiginous stage lasted a total period of four years, gradually fading out four months after the removal of her teeth. At my request, she presented herself for re-examination recently, i.e. more than fifteen years after my first examination. I found that she had a remnant of hearing in the affected (right) ear but that she was otherwise perfectly fit. The tympanic membranes were normal on both sides and there was no evidence of infection in the nose, mouth or throat, but she had developed a moderate hyperostosis in the affected ear.

This next case seems to me to be of particular importance in that I have never seen the patient but am indebted to the literature and to Mr. Cleminson for the detail.

Mrs. H. first came to my notice in an article by Gray in this *Journal* (*Journal of Laryngology and Otology*, vol. xlv, No. 12, December, 1929, p. 818) on "Paracusis Dysharmonica". He stated in the article that the disturbance in tone perception must be associated with trouble in the internal ear but also stated, without, however, giving any convincing evidence, that in all probability the middle ear was affected by a catarrhal or other process. He mentioned that the case had also been



## Aural Vertigo

seen by Mr. Cleminson, who has now given me details of her further history up to date.

When first seen in 1928, she had some diminution in hearing in the right ear for the watch and this largely disappeared on inflation. There was also some diminution by bone conduction for the 128 tuning fork. The tympanic membranes did not show any light reflex but were otherwise normal. During the subsequent nine years to date, the hearing in the right ear gradually depreciated until she now hears the watch only on contact and her labyrinth is insensitive when tested by the caloric test. Attacks of vertigo with vomiting and a sense of pressure in the right ear started about eight years ago and have persisted ever since. During the earlier attacks, she had a sense of rotation of objects around her. At a later date, she described a "hammer blow" giddiness. This, she says, felt as though she had been struck on the head and as if she would fall if she were out in the street. Mr. Cleminson suggests to me that these attacks were utricular in type. She has been inflated with an Eustachian catheter at intervals during the nine years, but although this at first produced some improvement in the hearing on the right side, latterly this improvement has been absent. During the last few months, the hearing in the left ear has tended to depreciate also.

These two cases are so similar that there can be no question but that they represent the same disease. In both, the initial complaint was regarded by a number of otologists as being due to a middle-ear lesion, while the later history makes it certain that there was a progressive labyrinthine one. I believe, therefore, that we otologists were wrong in our diagnosis as to the middle ear. On what evidence do we at present recognize the existence of a catarrhal otitis media in a case in which the tympanic membranes approach the normal? On consideration, it will, I believe, be accepted that this diagnosis is based on the results of functional hearing tests and on the occurrence of an improvement in the hearing on inflation of the middle ear. I suggest that the whole basis on which tuning fork tests have been built in the past needs reconsideration. The first result of an inflammatory lesion which involves nerve elements is to produce irritability and hypersensitiveness, and it is only when such an inflammatory condition has progressed that loss of function becomes manifest. The analogy of the inflamed pulp of a tooth leading first to

## A. J. Wright

tenderness and later to insensitiveness will appeal to everyone. Our outlook has been that any lesion in the labyrinth must be accompanied by loss of hearing, although on the general grounds which I have just mentioned, it would seem certain that, in the early stages, one should find an increase and not a diminished sensitivity to sounds. We have for some time appreciated that such hypersensitivity is found in relation to the vestibular portion of the labyrinth, and it seems only rational to extend this to the auditory portion as well. If this conception be accepted, then, in the case of a labyrinthine lesion, we may and I believe we do sometimes find, in the early stages, an increase in tone perception. That this is not commonly found is no doubt explained by the fact that one is dealing with very delicate nerve structures which are relatively easily destroyed.

In the group of cases which formed the basis for my paper, some 20 per cent. showed naked eye evidence of past inflammatory lesions in the middle ear. Although, at first sight, it would seem probable that these changes had some ætiological bearing on the labyrinthine disease, I am satisfied that this is not the case. The incidence of similar changes in the middle ear in cases with foci of infection in the nose, throat or mouth, but without labyrinthine disease, was found to be identical both as checked by my own records and by those of my colleague, Mr. Scarff. I think it reasonable, therefore, to regard the middle-ear changes as being purely coincidental.

### **Cases in which Focal Infections have been treated Surgically**

I.—Mrs. B., æt. 64.

Severe attacks of vertigo with vomiting and tinnitus for seven years. Tympanic membranes were normal and the Eustachian tubes clear.

Hearing.—Right : Conversational voice, 1 foot ; raised lower limit. Left : No hearing.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Teeth removed.

Result.—Six years later cessation of vertigo with persistence of deafness.

II.—Mrs. B., æt. 63.

Severe vertigo, tinnitus and vomiting. Two attacks during the twelve days before she was first seen. Tympanic membranes normal.

## Aural Vertigo

Hearing.—Right : Normal. Left : Conversational voice, 6 feet ; all tones lost below 1024.

Focal Lesion.—Recurrent tonsillitis. Last attack three months ago.

Treatment.—Tonsillectomy.

Result.—Five months later, vertigo less and no attacks for two months. Hearing : Left, conversational voice, 12 feet.

III.—Miss B., æt. 49.

Two years' vertigo with deafness left ear. Four weeks ago, severe attack with vomiting and deafness right ear. Tympanic membranes normal, Eustachian tubes clear.

Hearing.—Right : Nil. Left : Loud voice at ear ; lower limit raised.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Removal of teeth.

Result.—Twelve years later says vertigo ceased shortly after removal of teeth. Hearing unaltered.

IV.—Mr. H. B., æt. 46.

Variable defect in hearing for twelve years, with severe tinnitus, vertigo and vomiting. Tympanic membranes normal.

Hearing.—Right : Conversational voice, 6 feet. Left : Conversational voice, 6 inches ; loss of high tones both.

Focal Lesion.—Double antral sinusitis.

Treatment.—Double intranasal operation.

Result.—Six months later, cessation of vertigo. Hearing : Right and left, conversational voice, 3 feet.

V.—Mr. J. C., æt. 33.

Severe attacks of vertigo with vomiting and tinnitus for four years. Tympanic membranes normal.

Hearing.—Right : Slight lowering for whispered voice and raising of lower tone limit. Left : Normal.

Focal Lesion.—Dental abscess and right antral sinusitis.

Treatment.—Infected tooth removed.

Result.—Four months later, vertigo gone, hearing in right ear returned to normal and antral sinusitis resolved.

VI.—Miss M. A. C., æt. 43.

Frequent severe attacks of vertigo with vomiting and tinnitus for four months. Tympanic membranes normal.

Hearing.—Right and left normal, but states that there is some deafness in the left ear two or three days before the attacks.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Removal of teeth and tonsils.

Result.—Two years later, cessation of vertigo and hearing normal.

## A. J. Wright

VII.—Mr. W. A. D., æt. 52.

Slight vertigo with tinnitus but without vomiting for three years. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Conversational voice, 2 feet. Left : Conversational voice, 6 feet. Raising of lower limit both.

Focal Lesions.—Oral infection and chronic tonsillitis (iritis many years ago).

Treatment.—Removal of teeth.

Result.—Four years later, cessation of vertigo. Still recurrent defect in hearing.

VIII.—Mr. P. H., æt. 54.

Severe attacks of vertigo with vomiting and tinnitus for three years. Tympanic membranes moderately retracted. Exostoses in both meati.

Hearing.—Right : Conversational voice, 10 feet ; loss of low tones up to 2048. Left : Conversational voice, normal.

Focal Lesions.—Double antral sinusitis.

Treatment.—Double Caldwell Luc operation.

Result.—One year later, vertigo gone and hearing returned to normal.

IX.—Mr. H. W. H., æt. 48.

Severe attacks of vertigo with vomiting and tinnitus for three years. Right tympanic membrane normal, left advanced post-suppurative cicatricial changes.

Hearing.—Right : Conversational voice, 12 feet. Left : Nil.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Removal of teeth.

Result.—Seven years later, cessation of vertigo following removal of teeth.

X.—Mrs. K., æt. 56.

Severe vertigo with vomiting and tinnitus for eighteen months. Right tympanic membrane normal, left cicatricial with depressed scar.

Hearing.—Right : Conversational voice, 15 feet ; upper limit lowered. Left : Slight reduction all tones (? due to middle-ear scarring).

Focal Lesion.—Left antral sinusitis.

Treatment.—Left intranasal antral operation.

Result.—Four months later progressive diminution in frequency and severity of attacks.

Hearing.—Right ear now normal.

XI.—Mrs. K., æt. 55.

Slight vertigo with tinnitus of one week's duration. Tympanic membranes normal and Eustachian tubes clear. Inflation improved the hearing on the left side.

## Aural Vertigo

Hearing.—Right : Whisper, 6 feet ; no tone loss. Left : Conversational voice, 6 feet ; distortion of low tones and lowering upper limit.

Focal Lesion : Chronic tonsillitis.

Treatment.—Tonsillectomy.

Result.—Five months later, cessation of vertigo and improvement in hearing.

XII.—Mr. E. L., æt. 49.

Severe attack of vertigo with vomiting and tinnitus one month before he was seen. Tympanic membranes normal.

Hearing.—Right : Nil. Left : Normal.

Focal Lesion.—Oral infection.

Treatment.—Removal of teeth.

Result.—Six months later, vertigo ceased shortly after removal of teeth. Hearing unaltered.

XIII.—Mr. J. L., æt. 36.

Frequent attacks of vertigo with vomiting and tinnitus for ten days. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Conversational voice, 6 feet ; upper limit lowered to 512. Left : Normal.

Focal Lesion.—Chronic right antral sinusitis and chronic tonsillitis.

Treatment.—Right intranasal antral operation and tonsillectomy.

Result.—Four months later, vertigo ceased and hearing normal.

XIV.—Mrs. O., æt. 43.

No vertigo but deafness on the right side for eight years and on the left for one week with pulsating tinnitus.

Hearing.—Right : Conversational voice, 6 inches ; no hearing for forks. Left : Conversational voice, 15 feet ; upper limit lowered.

Focal Lesion.—Chronic tonsillitis.

Treatment.—Tonsillectomy.

Result.—Two months later hearing in left ear normal, right unaltered.

XV.—Miss H. P., æt. 40.

Severe tinnitus, vertigo and vomiting for five years. Tympanic membranes normal.

Hearing.—Right : Nil. Left : Normal.

Focal Lesion.—Chronic tonsillitis.

This patient had division of the right VIIIth nerve eight months before she came under my observation. She had grossly infected

## A. J. Wright

tonsils with recurrent tonsillitis and still some subjective vertigo which was probably functional.

Treatment.—Tonsillectomy on account of recurrent tonsillitis.

Result.—The subjective vertigo is diminishing.

The case is included because, in my opinion, tonsillectomy would have made the nerve section unnecessary.

XVI.—Mr. R. I., æt. 43.

Severe vertigo, vomiting and tinnitus for ten years, with remissions. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Normal. Left : Conversational voice, 10 feet.

Focal Lesion.—Chronic tonsillitis.

Treatment.—Tonsillectomy.

Result.—Two years later, cessation of vertigo and tinnitus.

XVII.—Mr. W. R. S., æt. 39.

Three years severe earache, vertigo, vomiting and tinnitus. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Slight diminution for whispered voice, lowering of upper limit. Left : Normal.

Focal Lesions.—Right antral sinusitis, chronic tonsillitis.

Result.—Eight months later, vertigo gone, hearing unaltered.

XVIII.—Mrs. S. G., æt. 29.

This is one of the two illustrative cases already detailed.

XIX.—Dr. G. V., æt. 37.

Vertigo, vomiting and tinnitus for six years, with remissions. Right tympanic membrane scar, left normal. Eustachian tubes clear.

Hearing.—Right : Conversational voice, 8 feet ; low tones lost up to 4096. Left : Normal.

Focal Lesions.—Left antral sinusitis, chronic tonsillitis.

Treatment.—Left intranasal antral operation and tonsillectomy.

Result.—Six years later, vertigo ceased. Hearing in right ear for conversational voice, 15 feet. Hears all forks from 512 upwards.

XX.—Mrs. W., æt. 53.

Severe vertigo, vomiting and tinnitus for four years. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Conversational voice, 10 feet ; lowering upper limit. Left : Normal.

Focal Lesion.—Double antral sinusitis, which had been missed by several otologists including myself, over a period of five years.

Treatment.—Double intranasal antral operation.

Result.—Six months later, vertigo gone and patient driving car. Hearing unaltered.

## Aural Vertigo

XXI.—Miss E. F. W., æt. 64.

Severe vertigo, vomiting and tinnitus for thirty-nine years. Tympanic membranes thickened with stretching of the posterior segment.

Hearing.—Right : Conversational voice, 12 feet. Left : Conversational voice, 12 feet.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Removal of teeth.

Result.—Nine years later, vertigo less, still gross tonsillar infection and slight increase in deafness.

XXII.—Mr. G. H. W., æt. 63.

Severe vertigo, vomiting and tinnitus for eight months. Slight opacity of tympanic membranes.

Hearing.—Right : Conversational voice, 12 feet. Left : Conversational voice, 15 feet.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—Removal of teeth.

Result.—Two years later, cessation of vertigo.

XXIII.—Mr. L. H. G., æt. 39.

Two severe attacks of vertigo with vomiting and tinnitus during the last month. Tympanic membranes normal and Eustachian tubes clear.

Hearing.—Right : Conversational voice, 2 feet ; loss of low tones up to 2048. Left : Normal.

Focal Lesions.—Oral infection and chronic tonsillitis.

Treatment.—One infected molar removed.

Result.—One year later, vertigo ceased and hearing normal.

### MISCELLANEOUS CASES EXCLUDED FROM GENERAL GROUP

I.—Mr. J. Temporary disturbance when travelling in tube, accompanied by diplopia and probably visual. One attack only.

II.—Mr. M. An isolated urticarial lesion of the vestibule due to eating pork.

III.—Mr. H. Depressed posterior scar with fistula sign but no perceptive defect.

IV.—Mrs. M. Probably thrombus or hæmorrhage. Woman of seventy-five with sudden severe attack, with complete loss of hearing in affected ear.

V.—Mr. N. Temporary vertigo as a result of lost plug of wool in the ear. Ceased on its removal.

VI.—Mrs. P. Case of otosclerosis. Severe vertigo with vomiting.

VII.—Mrs. T. Probably syphilitic.

VIII.—Mrs. W. Undiagnosed, but probably cerebral lesion. Seen by Neurologist.

# A. J. Wright

## Summary

1. As a result of the critical analysis of seventy-three cases, the author regards the majority of cases of aural vertigo in which middle-ear suppuration is not present as being due to a chronic labyrinthitis.

2. As a result of his research, he believes that the condition is not secondary to middle-ear disease.

3. From the evidence, he deduces that the labyrinthine disease results from a focus of infection, usually situated in nose, throat or mouth.

4. He suggests the name of "Focal Labyrinthitis" for this disease.

Diese klinische Studie über Schwindel gründet sich auf 73 Fälle des Verfassers, die sorgfältig verfolgt wurden. Auf Grund seiner Beobachtungen glaubt Verf. dass die Mehrzahl der Fälle von Ohrschwindel, bei denen keine Mittelohreiterung vorlag, auf chronische Labyrinthitis zurückzuführen sei. Nach seiner Ansicht tritt sie nicht als Folge von Mittelohrerkrankungen auf. Aus seinen Beobachtungen schliesst er, dass diese Labyrinthkrankung auf einem Infektionsherd in der Nase, im Rachen oder Mund beruht und schlägt dafür den Namen "Herdingfektionslabyrinthitis" vor.

Cette étude clinique des vertiges est basée sur une série de soixante-treize cas observés par l'auteur & qui ont été suivis attentivement. Ces observations l'ont amené à considérer la majorité des cas de vertige otique dans lesquels il n'y a pas de suppuration de l'oreille moyenne, comme étant dûs à de la labyrinthite chronique. A son avis, elle n'est pas secondaire à une affection de l'oreille moyenne. Il pense, d'après les cas qu'il décrit, que l'affection du labyrinthe résulte d'une forme d'infection, habituellement située dans le nez, la gorge ou la bouche. Il propose le nom de "Labyrinthite focale" pour cette maladie.