A CLINICAL STUDY OF THE SEROUS AND PURULENT DISEASES OF THE LABYRINTH

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ERICH RUTTIN

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Trieste

TRANSLATOR'S PREFACE

THIS translation of Dr. *Ruttin's Klinik der serösen und eitrigen Labyrinth-Entzündungen* has been made in response to the persistent demand on the part of many American and English students of otology who have followed the author in the Vienna clinic and who wish to possess the monograph in their own language.

Others, both otologists and general practitioners, who are not familiar with recent progress in the diagnosis and treatment of labyrinthine complications will find it a practical treatise upon the subject, which should prove a useful guide in dealing intelligently with those cases of labyrinth involvement which are constantly appearing in practice, but which until very recently have too often been unrecognized or misinterpreted.

The original text has been closely followed, though the case histories have been somewhat abbreviated.

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FOREWORD

Diseases of the labyrinth have at the present time become the center of interest among otologists, and justly so, for the recognition of diseases of the labyrinth claims our closest consideration, not only because of the functional importance of this organ, but also because of the vital significance of an extension of an inflammatory process from the labyrinth into the cranial cavity. It may be stated here without presumption that the Vienna school has very materially advanced our knowledge concerning the normal and diseased labyrinth, particularly of the vestibular apparatus, and possesses a valuable experience as regards the therapy of the labyrinth.

Naturally the establishment of basic principles in regard to the diagnosis and treatment of the various affections of the labyrinth demands still further exhaustive investigations on the part of specialists. And from this point of view it would appear justifiable, because of its large wealth of clinical material, that the present position of the Vienna school of otology be presented.

My assistant, Dr. *Ruttin,* who for years has devoted himself zealously to the study of diseases of the labyrinth, and to whom we are already indebted for several valuable monographs, presents in the following work a detailed description of the diseases of the labyrinth, in which the functional manifestations of the normal and diseased labyrinth, the different clinical aspects and the therapeutic considerations in each case are discussed and presented in a manner comprehensible even to the non-specialist.

I hope, therefore, that this book will receive the general notice and circulation it deserves, and that it is destined to yield a valuable contribution to our literature, not only by way of enlarging our knowledge of labyrinthine diseases, but also helping to clear up some as yet unsettled views in this field.

Prof. Dr. Victor Urbantschitsch.

Vienna.

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CHAPTER I

FUNCTIONAL EXAMINATION

Since we have united in the labyrinth two organs each having a different function, the cochlea and the vestibular apparatus, so the functional examination must include both organs separately.

It is advantageous to take up the functional tests according to a scheme which we use at the clinic as follows:

Cochlear Examination

Right		Left
	Conversational Voice	
	Whispered Voice	
	Weber	
	Rinne	
	Schwabach	
	C_1	
	C^4	

Vestibular Examination

Spontaneous Nystagmus
Turning or Rotation Reaction
Fistula Symptom
Caloric Reaction
Galvanic Reaction

In this scheme the cochlear and the vestibular portions are considered separately.

1. Examination of the Cochlea

First of all, attention must be called to the fact that merely closing the external meatus of the ear not under examination so poorly excludes it from participation in the

act of hearing that results obtained by this method are not at all reliable. The recognition of this element of uncertainty has led to the suggestion of various aids, particularly for the diagnosis of unilateral deafness (the Lucae-Dennert test, conversation tube, etc.). These, at the present time, have all become superfluous through the invention of the so-called exclusion apparatus. *Bárány*, by means of a loud intra-aural noise, has entirely excluded the ear not under examination. We now employ his exclusion apparatus (Lärmapparat). Other forms have been devised by *Voss* and *Neumann*. (See Fig. 15A on page 27.)

If, on applying this apparatus to the ear not being tested, the loud voice next to the ear (ad concham) is not heard, we may assume that the examined ear is deaf for speech. Deafness for speech alone, however, is not sufficient to prove that the cochlea has completely lost its function. For this purpose we must also ascertain what is the perception for tuning forks. Our common tuning fork tests often give very useful clues, even though they are not sufficient to prove the presence of complete unilateral deafness. If, in Weber's test, there is lateralization to the healthy side, if at the same time Rinne is $\infty -$ (infinitely negative), that is, if the tuning fork is perceived only by bone conduction; if the deep tones (C_1) are not heard and there is present a shortening for high tones (C^4), then the diagnosis of a unilateral total deafness is very likely. The cardinal tests (Weber, Rinne and Schwabach) are made with a fork of medium pitch (e).

More exact than the ordinary test is the examination according to Bezold's method by means of the continuous tone series of Edelmann. This combination of tuning forks and whistles includes the entire limit of perception of the human ear and permits of the determination of an unaltered or altered power to perceive each tone. But this procedure is not practical of execution clinically, for it consumes too much time.

Bezold has himself shortened the procedure by exam-

ining up to C^2 only by octaves, and from there on by quints. But in order to prove with certainty a unilateral deafness, it is necessary to construct a so-called tone relief, or curve; that is to say, the tones are projected upon the abscissa and their duration upon the ordinate. The diagram thus obtained is compared with that of the normal ear. The hearing curve for a person with unilateral deafness begins with a^1 (if the other ear is normal) and shows a rise in the duration with the pitch; that is, a relation opposite to that which is found in the normal ear.

Since this procedure is also too bothersome, *Wanner* has proposed that we use the unweighted a^1 fork with a duration of ninety seconds. According to his assertion, if this fork is not heard by air conduction by the ear under examination, we may assume total deafness for this side.

Another very simple procedure has been proposed by *Bárány*. If we touch the promontory (of course, through a perforation in the membrane) with a probe whose end is in contact with a vibrating tuning fork, a person with even a very high degree of deafness will perceive the sound of the fork. One who is totally deaf will not react, for this tone is not transmitted to the opposite side.

Further, *Neumann* has endeavored to utilize bone conduction to determine unilateral total deafness. The sound of a vibrating tuning fork placed upon the mastoid of the tested ear is influenced both as to intensity and timbre by closure of the external meatus of the sound side, but not when the meatus of the affected side is closed.

2. Examination of the Vestibular Apparatus

The vestibular apparatus reacts to the movement of its lymph by a reflex movement of the eyes which we call nystagmus.

A. DEFINITION

Nystagmus is a rhythmic, associated movement of both eyeballs; rhythmic, because it consists of two regular com-