

THE YEAR BOOK *of the* EAR, NOSE & THROAT AND MAXILLOFACIAL SURGERY

(1957-1958 YEAR BOOK Series)

THE EAR, NOSE & THROAT

EDITED BY

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MAXILLOFACIAL SURGERY

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PUBLISHERS' FOREWORD

Beginning with this year's series (1957-1958) the literature of Otorhinolaryngology which formerly was presented as one section of the YEAR BOOK OF EYE, EAR, NOSE & THROAT has been made into a separate volume to permit the editors to include more articles and to provide room for the addition of a section on Maxillofacial Surgery. It is the publishers' hope that this will give the book a wider field of usefulness to both the specialist and the general practitioner. The literature on the eye will be covered in a separate volume to be called the YEAR BOOK OF OPHTHALMOLOGY.

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YEAR BOOK QUIZ

THE NEW YEAR BOOK OF EAR, NOSE & THROAT AND MAXILLOFACIAL SURGERY 1957-58 SERIES

The scores of significant world-wide advances detailed in this latest YEAR BOOK shed important light on the new diagnostic and therapeutic procedures applicable to the type of cases seen most frequently in this field of practice. Test your familiarity with the current literature by trying the questionnaire that thousands of physicians look forward to each year.

- 1 What appears to be the most important etiologic factor in tongue cancer?
For the answer, see page 270.
- 2 On which is chlorpromazine more active, sympathetic or parasympathetic system?
See page 13.
- 3 Will laryngeal papilloma in children disappear at puberty?
See page 181.
- 4 What treatment has been cited as a new cause of adhesive otitis?
See page 105.
- 5 What finding serves to avert confusion in diagnosis of Ménière's disease?
See page 26.
- 6 What is considered the best composition of nasal sinus irrigating fluid?
See page 155.
- 7 What is a major factor in delay in diagnosis of nasopharyngeal cancer?
See page 244.
- 8 What is the main problem with acoustic neurinoma?
See pages 75-76.
- 9 What is indicated if scratch and intracutaneous allergy tests are negative?
See page 225.
- 10 What is considered a more reliable sign of parotid cancer than duration, size or location?
See page 296.

(OVER)

- 11 What appears to be the predominant factor in chronic secretory otitis media?
See page 87.
- 12 What approach probably is best in nasopharyngeal surgery?
See page 168.
- 13 In Bell's palsy, what time interval appears best before operation?
See page 119.
- 14 What is the most common etiologic factor in pneumothorax associated with tracheotomy?
See page 209.
- 15 In division of the mandible, why must the point of entry be anterior to the mental foramen?
See page 256.
- 16 Give 2 advantages claimed for rigid prosthesis in flat nose repair.
See page 327.
- 17 What condition must be excluded in diagnosis of traumatic embolism of internal auditory artery?
See page 60.
- 18 What procedures are credited for steady improvement of technics for mobilization?
See pages 133-134.
- 19 What is the problem with precancerous lesions of the respiratory tract?
See page 237.
- 20 Neurotic reasons are credited with what % of requests for nasal cosmetic surgery?
See page 313.
- 21 What possible etiologic factor in malignant granuloma has been suggested recently?
See page 358.
- 22 With which bronchus do esophageal fistulas communicate most often?
See page 195.
- 23 What seems to be the ultimate trigger factor in female laryngeal carcinoma?
See page 280.

The New Year Book of Ear, Nose & Throat and Maxillofacial Surgery, 1957-58 Series, edited by JOHN R. LINDSAY, M.D., Univ. of Chicago; Maxillofacial Surgery, edited by DEAN M. LIERLE, M.D., and WILLIAM C. HUFFMAN, M.D., State Univ. of Iowa. 383 Pages; 96 Illustrations. \$7.50.

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INTRODUCTION

THE INCREASE IN CURRENT LITERATURE in the fields of ophthalmology and otolaryngology in recent years has made it advisable to expand the YEAR BOOK OF EYE, EAR, NOSE & THROAT beyond the capacity of a single volume. This year a separate book has been assembled for each of the two specialties.

The additional space now available has made it possible to broaden the scope of the material included. The traditional custom is maintained of tailoring each abstract to convey all the essential information so that only the reader who is especially interested in details will find it necessary to consult the original.

The specialty of otolaryngology, contrary to occasional predictions after the antibiotic era came in, has been advancing along several lines. Instead of being primarily occupied with acute suppurative disease, the otologist has been directing more attention to conservation and improvement in hearing. Otologic surgery has developed to a fine art during the past 3 decades. Such procedures as decompression and repair of the facial nerve, drainage of suppurative foci in the petrous pyramid, the fenestration operation, mobilization of the stapes, myringoplasty and tympanoplasty are refinements which have become routine in most teaching centers.

Investigation in the fields of hearing and vestibular function has been expanding and, under the stimulation provided by some of the national specialty groups and certain governmental agencies, can be expected to develop further.

The fields of audiology, the effect of noise on hearing, and conservation of hearing in the child and adult are some of the areas in the field of otology which have been increasingly active in recent years.

Other specialized areas which have been developing within the general field of otolaryngology are allergy, peroral endoscopy, voice production and the broad field of maxillofacial surgery. While selections are made from the current literature in these special areas, the editors recognize the fact that

more than 25% of the general practice of medicine has been found to consist of diseases of the ears, nose and throat. Therefore, such areas as respiratory tract infections, diseases of the esophagus and swallowing mechanism, the salivary glands, sinus disease, headache and many other conditions coming to the attention of the practitioner as well as the specialist are given coverage.

Since maxillofacial surgery covers a specialized field in otolaryngology it has been given a separate section. In it is included mainly the management of fractures, plastic and reconstructive surgery and malignant tumors of the maxillofacial region and neck.

JOHN R. LINDSAY

THE EAR

VESTIBULAR FUNCTION AND VERTIGO

Extensive Venous Obstruction of Labyrinth: Vestibular Changes. Robert Kimura and H. B. Perlman¹ (Univ. of Chicago) studied vestibular lesions produced by venous obstruction of the labyrinth in 38 guinea pigs. Only one ear of each animal was operated on but both ears were processed, together with the midbrain.

Over 80% of the animals showed signs of vestibular disturbance after obstruction of the inferior cochlear vein and some of its tributaries. When they awakened, rapid horizontal nystagmus to the unoperated side was evident. In addition, the neck and trunk were twisted toward the operated side and the animals tended to roll over in this direction. On the 2d day, the nystagmus rate was reduced about half, but the animals continued to show marked asymmetry in tonus of the neck and trunk muscles. They were easily disturbed into vigorous circling movements without falling. By the 3d day, the nystagmus had generally disappeared and the circling movement had lessened, but it remained in some animals as long as 10 days. In addition, the head was tilted with the operated ear lowermost; this position was sometimes retained as long as 2 months.

Histologic changes in the vestibular apparatus were less severe than those produced in the cochlea. The sensory cells of vestibular end organs were particularly affected. The sensory cells of the saccule showed the greatest involvement, whereas the sensory cells in the utricle and cristae were less severely damaged. Marked perilymphatic hemorrhage followed by fibrosis and ossification was produced. New bone formation was most frequent in the canals. Even complete

(1) Ann. Otol., Rhin. & Laryng. 65:620-638, September, 1956.

occlusion of the endolymphatic space in the superior canal was observed. Detachment and disintegration of the otolithic membrane were observed when there was extensive degeneration of the neuroepithelium. There was evidence of active mobility of the pigment cells, as well as disintegration. The epithelial cells along the walls of the utricle and ampullae contained an abnormally large number of yellow-brown granules.

Other structures of the vestibular apparatus, including the cells of the planum semilunatum and of the endolymphatic sac, were extremely resistant to this vascular lesion.

Proteins of Perilymph. E. Antonini, V. Casorati and S. Crifó² (Univ. of Rome) studied the proteins of the perilymphatic liquid, blood serum and cerebrospinal fluid of the horse. The perilymph had a protein content of about 290 mg./100 ml., appreciably more than that of the cerebrospinal fluid and much less than that of the blood serum. Paper electrophoresis of the protein constituents showed that all the fractions in the blood serum and in the cerebrospinal fluid are present in the perilymphatic liquid and that, compared with the blood serum, the perilymph contains more beta globulin and less gamma globulin.

Previously, the authors had shown that free amino acids and keto acids are present in the perilymph of horses in appreciably greater amount than in the cerebrospinal fluid and in a similar amount to that found in the blood.

The fact that the level of amino acids and of proteins is much higher in the perilymphatic liquid than in the cerebrospinal fluid suggests that the perilymph is not a simple derivate of the cerebrospinal fluid but probably originates from the blood through a selective filtering process.

Normal and Pathologic Threshold of Perception of Angular Accelerations for Optogyral Illusion and Turning Sensation. The test person's visible surroundings are reduced to a small luminous spot in a fixed position about 1 m. from his eyes. Caloric or rotatory stimuli are applied, and the luminous spot gives the impression of moving in a certain direction, at first with considerable speed; later it slows down and, after some time, gradually stops. The end point of the

(2) Ann. Otol., Rhin. & Laryng. 66:129-134, March, 1957.

illusion can be determined by the subject with reasonable certainty, and more easily and definitely, than the end point of the turning sensation. The optogyral illusion is independent of nystagmus.

L. J. Roggeveen and P. Nijhoff³ (Univ. of Leyden) made 24 observations, using the turning chair of Hl. de Vries. Each patient submitted to about 50 stimuli with each of 3 accelerations.

The divergent threshold values found in the literature on investigations of vestibular organ function are due to differences in methods, criteria and calculations. Threshold determinations with a torsion swing tend to be lower than those with unidirectional stimulus. It is easier to feel a difference between rhythmically alternating periods of stimulation and no stimulation than to recognize a small stimulus during a prolonged stimulation time. The optogyral illusion is a more sensitive criterion than the sensation. Another criterion is the 50% threshold, where the same stimulus is noticed one moment and passes unnoticed the other.

If the normal threshold curves possibly intersect zero (acceleration and fraction), this is not necessarily true of patients with vestibular disturbances. In most patients, Ewald's law seems valid, even for small accelerations. In the pathologic threshold curves, sensitivity to optical illusion and to sensation are considerably different. The optical illusion is not affected to the same degree as is sensation, compared with normal values.

These interesting discrepancies between optical illusion and sensation in the threshold zone of perception, together with the sometimes very high threshold values and data of the other vestibular tests might some time, when more will be known about vestibular pathways, lead to a more precise topographic diagnosis.

Nystagmography: Recording of Nystagmus in Clinical Neuro-otologic Examinations were performed by Gunnar Aschan, Martin Bergstedt and Jan Stahle⁴ (Royal Academic Hosp., Uppsala) with aid of an ECG plus one of several different preamplifiers. In tracing horizontal nystagmus, the

(3) *Acta oto-laryng.* 46:533-541, Nov.-Dec., 1956.

(4) *Ibid.*, supp. 129, 1956.

electrodes are placed at the outer canthi of the eyes and secured with adhesive tape. The patient is grounded by a third electrode, usually placed on the forehead. In recording vertical nystagmus, one electrode is placed above the orbit and the other is placed below it; the patient is grounded by a third electrode, as before.

Practically every technical difficulty encountered was due to careless arrangement of the electrodes, damage to the leads, etc. In records of horizontal nystagmus, upward deviation of the curve always represents an eye movement to the right and a downward deviation an eye movement to the left. In records of vertical nystagmus the direction of the beats is always indicated on the diagram. Arrows marked "up" always mean nystagmus toward the vertex and arrows marked "down" mean nystagmus towards the chin. Similarly, all curves should be read from left to right.

Calibration is done to obtain a measure of the eye movements expressed in degrees of rotation of the eye and translated into millimeters of deviation in the tracing. The patient fixes on a point 3.5 m. distant and rapidly shifts the glance to another point 10 degrees to one side of the first, the two points lying in the plane to be recorded. When the patient performs these calibration movements a suitable amplification can be achieved. With a recording range of 60 mm. a 10-20 mm. deviation representing 10-degree eye movements is usually suitable. Usually calibration is achieved without difficulty, but the patient may sometimes need the help of a pointing finger in transferring the gaze from one point to the other. In severely ill patients calibration may be impossible; a suitable degree of amplification must be attained by trial and error. Even in such records the degree of nystagmus induced by different stimuli can be compared.

An undeniable source of error in the recording procedure lies in the fact that with a single-channel recorder only the eye movements in the recording plane are accessible. With a two-channel instrument, simultaneous recordings of horizontal and vertical nystagmus can be made. That purely rotatory nystagmus cannot be registered by this technic is probably its most important disadvantage. Purely rotatory nystagmus is rarely met clinically, however, and the slightest horizontal or vertical component in the movement produces

a deviation in the tracing. Ocular nystagmus, such as fixation, rotatory and caloric nystagmus, recorded in the usual optimum positions, almost always beats in the horizontal plane and is readily recorded.

With speeds of up to 40-50 degrees/second and in tests carried out over relatively short periods (about 10 seconds) the human eye can keep pace. On acceleration, the speed of the eye lies somewhat behind that of the cylinder and shows lower values. On retardation, the reverse occurs. Nystagmography makes it possible to assess qualitatively and quantitatively the direction, eye speed, total amplitude and frequency of nystagmus. Eye speed and frequency are different expressions of the intensity of the phenomenon.

If nystagmus is recorded with the eyes closed, it is possible up to a point to check the eye movements. The displacements of the slightly protuberant cornea can often be seen through the upper eyelid, and confirmation can be obtained of the existence of the movements recorded. This is of particular value in the common cases in which nystagmus is not visible but can be recorded when the eyes are closed.

No type of positional nystagmus is associated with a given topographic diagnosis. The usefulness of a nystagmogram lies in its ability to establish an objective sign of disorder of equilibrium, thus proving vertigo to be of somatic origin. Persistent forms of nystagmus usually have a diagnostic significance distinct from that of transitory, "benign" nystagmus and usually require more exhaustive clinical investigation. It is often found that in patients showing diminished sensitivity of 1 labyrinth, directional preponderance or preponderance after rotatory stimuli, positional or spontaneous nystagmus is also manifest in the nystagmograms.

Effect of Chlorpromazine on Vestibular Function. Chlorpromazine has numerous pharmacodynamic effects, peripheral and central, on the nervous system. It is more powerful as a sympatholytic than as a parasympatholytic. It has sedative, hypnotic and psychoplegic properties and is an anesthetic, antipyretic and hypothermic. It is believed to have a central depressive effect on the activity of the reticular formation. This region of the brain stem has attracted interest in research on the vestibular function and it is considered to control the vestibular mechanism.