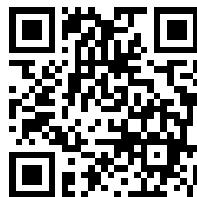
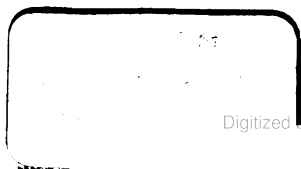

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>



✓
E. H. B.



TRANSACTIONS

OF THE

Twenty-ninth Annual Meeting

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

HELD AT

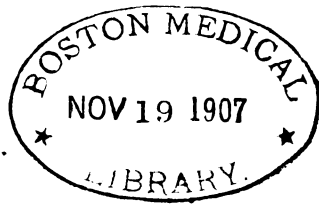
WASHINGTON, D. C.

May 7th, 8th and 9th, 1907

NEW YORK

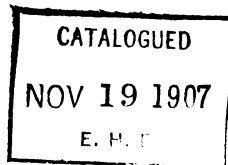
PUBLISHED BY THE ASSOCIATION

1907



6572

McCONNELL PRINTING COMPANY
230-242 WILLIAM STREET
NEW YORK CITY



PRESIDENTS OF THE ASSOCIATION.

(YEAR OF ELECTION.)

- 1879. LOUIS ELSBERG, M. D.
- 1880. J. SOLIS-COHEN, M. D.
- 1881. FREDERICK I. KNIGHT, M. D.
- 1882. GEORGE M. LEFFERTS, M. D.
- 1883. FRANCKE H. BOSWORTH, M. D.
- 1884. ERNEST L. SHURLY, M. D.
- 1885. HARRISON ALLEN, M. D.
- 1886. E. FLETCHER INGALS, M. D.
- 1887. RUFUS P. LINCOLN, M. D.
- 1888. E. CARROLL MORGAN, M. D.
- 1889. JOHN N. MACKENZIE, M. D.
- 1890. WILLIAM C. GLASGOW, M. D.
- 1891. SAMUEL W. LANGMAID, M. D.
- 1892. MORRIS J. ASCH, M. D.
- 1893. D. BRYSON DELAVAN, M. D.
- 1894. JOHN O. ROE, M. D.
- 1895. WILLIAM H. DALY, M. D.
- 1896. CHARLES H. KNIGHT, M. D.
- 1897. THOMAS R. FRENCH, M. D.
- 1898. WILLIAM E. CASSELBERRY, M. D.
- 1899. SAMUEL JOHNSTON, M. D.
- 1900. HENRY L. SWAIN, M. D.
- 1901. JOHN W. FARLOW, M. D.
- 1902. JOSEPH H. BRYAN, M. D.
- 1903. JACOB H. HARTMAN, M. D.
- 1904. CLARENCE C. RICE, M. D.
- 1905. JOSEPH W. GLEITSMANN, M. D.
- 1906. ARTHUR W. de ROALDES, M. D.

OFFICERS.

(ELECTED JUNE 20, 1906.)

PRESIDENT.

ARTHUR W. de ROALDES, M. D., NEW ORLEANS, LA.

FIRST VICE-PRESIDENT.

G. HUDSON-MAKUEN, M. D., PHILADELPHIA, PA.

SECOND VICE-PRESIDENT.

ALLEN B. THRASHER, M. D., CINCINNATI, OHIO.

SECRETARY AND TREASURER.

JAMES E. NEWCOMB, M. D., NEW YORK CITY.

118 West Sixty-ninth Street.

LIBRARIAN.

JOSEPH H. BRYAN, M. D., WASHINGTON, D. C.

COUNCIL.

The above *ex-officio* and

D. BRYSON DELAVAN, M. D., NEW YORK CITY.

JACOB H. HARTMAN, M. D., BALTIMORE, MD.

CLARENCE C. RICE, M. D., NEW YORK CITY.

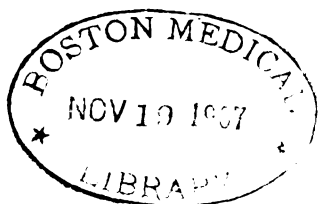
JOSEPH W. GLEITSMANN, M. D., NEW YORK CITY.

TABLE OF CONTENTS.

	PAGE
Address of the President, A. W. DE ROALDES, M.D.	I
<i>Papers and Theses:</i>	
I. A Case of Bilateral Abductor Paralysis of the Larynx. CHARLES H. KNIGHT, M.D.	7
II. Ligation of the External Carotid Artery, considered from a Rhinological and Pharyngological Standpoint. (Cand- idate's Thesis.) CHEVALIER JACKSON, M.D. . . .	14
III. Epithelioma: Total Laryngectomy, including the Removal of Part of the Trachea; Death from Pneumonia on the Thirteenth Day. CLEMENT F. THEISEN, M.D. . . .	27
IV. Sarcoma of the Pharynx in a Child of Eight Years, with Autopsy Findings and Microscopical Report. CLEMENT F. THEISEN, M.D.	31
V. Is there an Ideal Operation for the Correction of Devia- tions of the Nasal Septum? (Candidate's Thesis.) JOSEPH S. GIBB, M.D.	38
VI. Erysipelas and Its Relation to Purulent Inflammations of the Nasal and Aural Cavities. (Candidate's Thesis.) CHRIS- TIAN R. HOLMES, M.D.	43
VII. Tuberculosis of the Accessory Sinuses of the Nose. JOSEPH W. GLEITSMANN, M.D.	88
VIII. Large Tumor of the Laryngo-Pharynx removed by Sub- Hyoid Pharyngotomy. WALTER F. CHAPPELL, M.D. . .	98
IX. Demonstration of New Instruments for Bronchoscopy and Oesophagoscopy. PROF. GUSTAV KILLIAN	105
X. The Construction of the Ethmoid Labyrinth. (Candidate's Thesis.) GEORGE E. SHAMBAUGH, M.D.	110

	PAGE
XI. Massage of the Pharynx; Exhibition of an Instrument used for the Purpose by a Famous Actor. SAMUEL W. LANGMAID, M.D.	122
XII. Removal of Papillomata of the Larynx by Direct Instrumentation with the Aid of Killian's Tubes. CORNELIUS G. COAKLEY, M.D.	126
XIII. A Case of Spasm of the Oesophagus. JOHN W. FARLOW, M.D.	142
XIV. Modern Procedures in Excision of Intrinsic Malignant Growths of the Larynx. J. SOLIS-COHEN, M.D.	150
XV. Non-Recurrent Carcinoma of the Larynx removed through the Natural Passages. E. FLETCHER INGALS, M.D.	156
XVI. Report of a Case of Epithelioma of the Larynx; Removal by Thyrotomy; No Recurrence after Three and One-Half Years. HENRY L. SWAIN, M.D.	159
XVII. The Problem of Asepsis in the Routine Office Work of the Laryngologist. THOMAS HUBBARD, M.D.	168
XVIII. A Review of the Methods in Use for the Removal of Adenoids, with the Description of a Method which is Thorough, Rapid and Safe. GEORGE L. RICHARDS, M.D.	178
XIX. Straightening the Nasal Septum. ARTHUR W. WATSON, M.D.	192
XX. A Plea for Local Anaesthesia in Operations on the Maxillary Sinus. GORDON KING, M.D.	202
XXI. Myxofibroma of the Naso-Pharynx, causing Disfigurement; Report of a Case and Exhibition of Specimen. D. BRADEN KYLE, M.D.	207
XXII. A Case of Epithelioma of the Tongue; Early Diagnosis; Operation; Recovery. ROBERT C. MYLES, M.D.	212
XXIII. Ophthalmological Manifestations of Latent Disease of the Nose and Its Accessory Sinuses; Report of Illustrative Cases. FRANCIS R. PACKARD, M.D.	217
XXIV. Some Considerations relative to Systemic Infection through the Tonsillar Ring. JOSEPH L. GOODALE, M.D.	228

	PAGE
XXV. . A Case of Multiple Papilloma of the Larynx. SAMUEL W.	
LANGMAID, M.D.	243
Presentation of Instruments and Specimens	244
Business Meeting	245
Obituary—William Carr Glasgow, M.D.	257
List of Active Fellows, 1908	260
List of Corresponding Fellows, 1908	263
Past Officers	265
Past Members	267



TRANSACTIONS OF THE TWENTY-NINTH
ANNUAL MEETING OF THE AMERICAN
LARYNGOLOGICAL ASSOCIATION.

HELD AT WASHINGTON, D. C.

MAY 7, 8 AND 9, 1907.

THE PRESIDENT'S ADDRESS.

BY A. W. DE ROALDES, M. D.

Fellows of the American Laryngological Association:

It is with a full appreciation of my physical limitations and with deep emotion that I find my name linked with those who for twenty-nine years have, each in turn, been called to the Presidency of your honorable association. Far be from me the idea of rivalling such distinguished predecessors. Scientific work cut short by a precocious infirmity, and a tardy passage from general to special practice, would hardly justify such a pretension. Therefore it is without hesitation that I confess to a surprise at my election. Certainly your choice was dictated by other considerations. I am inclined to believe that, with some partiality toward me, your object was to recompense by the greatest honor to which an American laryngologist could aspire any benefit that may have accrued to the indigent sick, or to the specialty, by my foundation seventeen years ago of the Eye, Ear, Nose and Throat Hospital of New Orleans.

Let me also believe that you were actuated by the desire to recognize once more, this time in *my* modest personality, the merits of those confreres who have exerted themselves in behalf of the development of laryngology in the South, where their

number and influence are increasing every day. I take advantage of this meeting to thank you all for the honor, which touches me the more that I am the first to understand the necessity of your kind indulgence. I must in consequence bespeak the aid of your Vice-Presidents, of whom the choice seems to have been wisely made, to adroitly supply my insufficiency. I could not have expected a more thoughtful attention on your part. For their assistance, my grateful appreciation, as well as to our untiring Secretary, without whose obliging courtesy, consummate experience and gracious encouragement it would have been impossible to fulfil my functions. Neither must I omit to mention my predecessors, also members of the Council, whose authority and intelligence need no proving.

And now, my dear colleagues, having essayed to divine the significance of my election, I would like before proceeding further to submit for your consideration one or two points that bear on the upbuilding of our specialty. Assuredly, American laryngologists—your association in particular—have reason to be proud of the level it has attained in this country. We should not, however, rest here, for there are yet certain positions to acquire before a final victory will have been scored. The fight should be waged until our representatives be admitted everywhere on a footing of complete equality with those of other branches. To realize this legitimate ambition, among other efficacious means, there is one on which stress should be laid—that of the establishment of separate hospitals or infirmaries. In them laryngology has in a quarter of a century found the more or less brilliant affirmation of its entity. The results obtained in them are such as to justify the previsions of the far-sighted Elsberg of regretted memory, who, in 1879, enumerating in a masterly manner, before this association, the means of advancing our specialty, suggested as early as then the establishment of special hospitals. Experience has since repeatedly proven that, in addition to the teaching of an enlightened medical press, a well-balanced faculty and general hospitals with well organized departments, they frequently offer the most potent lever for the elevation of our studies. Excepting a few richly endowed services of large and wealthy hospitals, presided over by masters of renown, these separate institutions are

the boldest and most independent expressions of our branch. This assertion is consistent with the evolution of laryngology, harbored at first in private clinics, or municipal dispensaries, then in general hospitals, and finally, as need presents itself, in special institutions, according to the importance of the centres of population and the eleemosynary demands. One must admit that special hospitals, once established on intelligent bases, in well chosen sections, administered by able trustees and specialists, acquire a personal identity that puts them in relief, and around which doctors, patients and the public at large rally, while often special services in general hospitals are lost sight of in their numerous departments.

Let us now observe the development of this modern tendency. In summing up the special hospitals where laryngology figures in the official title of the institution alone, or in connection with two or three correlative branches, we find that in 1906 (Polk's Medical Directory) there were 15 such institutions, two dating their birth previous to the foundation of your association in 1878, and thirteen subsequent to that epoch-making period in American laryngology. It should, however, be remarked that under the equivocal appellation of Eye and Ear Infirmary or Hospital are enumerated sixteen other separate institutions where often exists a laryngological service of more or less importance. When such is the case, upon us laryngologists, devolves the responsibility of insisting that the name of our specialty be inscribed in the official title of the institution.

These statements made, I hope I am not understood as advocating the suppression of the special service of the general hospital; it is too necessary in the teaching of undergraduates, and the idea should not be entertained for a moment, for that, as well as for economic reasons. And while separate institutions should flourish, they should not be multiplied indiscriminately, but on the contrary be inaugurated with reflection and judgment in neglected sections, to serve in our specialty as do strongholds in the military occupation of a country. Who can tell but that in their maturity they may become institutions of higher learning in our branch, in fact, schools of technology, where the aspiring specialist may perfect his elemen-

tary special education as obtained in medical schools, or general hospitals, and where under the same roof, clinical and laboratory work would be combined with museum and library facilities. It is true that, as in the past, we may hope to count upon the co-operation of the oculist and otologist, and vice versa, but what matters it, if the autonomy of the different services be accepted, and they be administered by wise and impartial trustees?

Following still further the idea of promoting the study of our specialty, allow me now to contribute to the elaboration of another of Elsberg's suggestions in his address of 1878, and which has been agitated from time to time since then, namely, the foundation of a prize for the encouragement of research in rhino-laryngology, for the purpose of which I would like to tender to the Association a trust fund of five hundred dollars (\$500.00), the revenue of which would be offered triennially to the most valuable essay on the specialty, the conditions and terms of the competition to be decided by the Council, or such other committee as it would please you to name.

Our ranks, I am pained to say, have been twice visited this year by the grim destroyer, Death, who has ruthlessly taken from us two of our most distinguished members, Senor Manuel Garcia and, more recently, Dr. William Carr Glasgow. The latter died at his home in St. Louis, March 22nd, 1907, after an illness of two years; he was a founder of this Association, its president in 1890, and Professor of Clinical Medicine and Laryngology in the Medical Department of Washington University of St. Louis. In him the specialty has lost one of its strong pillars, and our society has to deplore the passing away of one of its most able and genial Fellows.

Manuel Garcia, our only honorary member, whose death occurred July 2nd, 1906, at Cricklewood, England, at the ripe old age of one hundred and one years and three months, was a beacon light in the laryngological world, marking an era in the specialty by his demonstration of the feasibility of inspecting the larynx in the living subject. He can be numbered among those great men whose monument needs no further epitaph than a name and a date.

In proposing as his successor the name of Leopold Von Schroetter, whose seventieth birthday has just been observed with eclat in Vienna, your Council has made a happy choice, which I trust will be received with acclamation. A pioneer in practical laryngology, he was one of the first to utilize Garcia's discovery, following closely in the wake of Türck and Czermak. His well-known handling of intra-laryngeal instruments has gained him a reputation for dexterity that few have attained and none have surpassed. His selection to fill the Chair of General Medicine in one of the greatest universities of the world is a rare distinction for a specialist.

The recent ceremony in Berlin in honor of Professor Bernard Fraenkel, one of our most brilliant Corresponding Fellows, was a just tribute to a career of scientific successes. No laryngologist can forget the impetus given by him to the specialty, which he has largely contributed to raise in Germany to the standard of other branches of medicine. Thanks are due Dr. Emil Mayer for the creditable showing made by the United States in the Fraenkel celebration.

In Easter week, 1908, will be held in Vienna an International Congress of Rhino-Laryngology, commemorative of the golden jubilee of the establishment of Clinical Laryngology by Türck and Czermak. For the first time, laryngologists from all over the world will meet in a plenary council of their own, with no object in view other than the consideration of subjects interesting to rhino-laryngology and its bearing on allied studies. As the oldest laryngological association, ours should be ably represented by the strongest possible delegation, willing to participate in the programme of the Congress.

I am pleased to notice among us the presence of Professor Killian, who, on a visit to America, has kindly consented to participate in our meeting. He is too well known to need an introduction. We extend him a cordial greeting and wish him an agreeable sojourn on our side of the Atlantic.

And now, gentlemen, I conclude where I should have commenced, by welcoming you in the capital of our great Union, where the organic rules of our scientific federation call you for the seventh time.

May the strenuosity of our Chief Executive be an example

of activity to us in our debates, and above all, may this meeting signal itself by the value of its communications and discussions; may the same good feeling and harmony that have always characterized our reunions prevail. Such is the wish of your President, who now calls to order this meeting, in declaring the 29th session of the American Laryngological Association ready for work.

A CASE OF BILATERAL ABDUCTOR PARALYSIS OF THE LARYNX.

BY CHARLES H. KNIGHT, M. D.

(Read by title.)

The differential diagnosis of abductor paralysis, adductor spasm and ankylosis of the cricoarytenoid articulation is often very difficult. A conclusion can be reached only after prolonged observation under various conditions. Especial care is needed to decide which element predominates when several co-exist. No doubt may arise in acute cricoarytenoid arthritis; in chronic cases there are often but few distinctive signs, More or less odynphagia, painful cough, tumefaction over the joint and pain on pressure along the posterior border of the thyroid cartilage, are mentioned by Escat among the symptoms. In addition the laryngeal mirror shows that the arytenoids are jammed together on phonation, instead of the sound one crossing in front of its disabled fellow, as seen in paralysis (Grabower). In ankylosis the vocal bands are tense; in paralysis they are flaccid and a sort of "flapping" movement in respiration is discernible. Moreover other general symptoms indicative of some constitutional disease are present. Spasm of the larynx may be quite persistent, as for example in hysteria, but it is usually clonic, or the position of the vocal bands varies from time to time.

Until within recent years abductor paralysis has been regarded as one of the rarest laryngeal neuroses, no less an authority than Stoerk having made a declaration to that effect. Yet seven years ago a list of one hundred and eighteen cases was collected by Wilson, and no doubt others might be added at present. (Laryngoscope, Sept., 1900.) Allowance being made for probable errors in diagnosis there still remain enough genuine cases to take the affection out of the catalogue of

curiosities. The origin of the disease may be central or peripheral, generally the former when both sides are involved. The causes assigned are various. Tabes, syphilis, pressure from swollen glands, aneurism, or a new growth, diphtheria, hysteria, lead poisoning or other toxemia, fright, voice strain, peripheral neuritis are all mentioned by different writers. In a large majority of cases there is a positive history of syphilis. It sometimes occurs at the very onset of tabes, as a so-called *laryngeal crisis*, and again it develops only after the diagnosis of ataxia has been firmly established by other phenomena.

In three cases reported by Lockard (*Ann. of Otol. Rhinol. and Lar.*, March, 1903), the laryngeal paralysis was detected seven to twenty-two months before any other symptoms of tabes. In twenty-two cases of tabes examined by Sendziak, paralysis or paresis of the abductor, unilateral or bilateral, was found in seven. From his own observations, which include forty-five other cases, and from those of Burger (seventy-one cases), he concludes that posticus paralysis is almost pathognomonic of tabes and often precedes other symptoms by a considerable interval. It appears, then, that in these cases a suspicion of syphilis is justified and that the laryngeal condition should be regarded as a possible forerunner of tabes. On the contrary, from an examination of twenty cases of locomotor ataxia in certain Philadelphia institutions, W. B. G. Harland reached the conclusion that involvement of the larynx in the early stages of this disease is very uncommon.

In the absence of paralysis nothing more than hyperemia may be discovered with the laryngoscope, but the parts are abnormally sensitive and an attempt to make an application to the larynx or even the mere examination may provoke a spasm. On the contrary anesthesia may exist. The discovery by Semon, and almost simultaneously by Rosenbach, that the fibres of the posticus muscle are exceptionally vulnerable, and the equally important discovery by Risien-Russell and Onodi that filaments to the abductor and the adductor muscles run in separate bundles in the recurrent nerve, have explained many phenomena of laryngeal paralysis previously obscure. The nerve filaments to the abductor are afferent and excite reflex tonic spasm in that muscle; those to the adductors are efferent

and are simple motor nerves. Thus the physiologic law that the irritability of afferent nerves is exhausted earlier than that of efferent nerves comes into play in determining an isolated posticus paralysis (Friedrich). The abductor, a respiratory muscle and solitary, is opposed by several adductors, phonatory muscles, the latter being not only more numerous but more powerful. Their superior strength and resistance is further explained by Grabower by the observation that the nerve endings in the adductors are more numerous, broader and firmer than in the abductors. These differences are a natural provision to meet the comparatively greater functional demands made upon the adductors. In paralysis of the larynx they are the last to yield and the first to regain power in case of recovery. It is hard to reconcile the divergent views regarding the musculature and the innervation of the larynx held by different observers. They may be due to individual anomalies, to faulty observation, or to the fact that experiments on the lower animals are misleading as regards the human species.

P. Schultz finds no sympathetic fibres in the recurrent, while Broeckaert believes that the laryngeal muscles are supplied by the sympathetic. The latter also opposes Semon's law and asserts that the external thyroarytenoid muscle possesses less vitality than the posticus and is the first to show signs of degeneration. The views of Krause (1884) and of Grossman are well known and the Hooper-Donaldson controversy before this Association is still fresh in our memory. In a recent paper the palatopharyngeus muscle is referred to as a "cord-stretcher" by tilting the thyroid cartilage. As a matter of fact, the comparatively insignificant fasciculus of this muscle attached to the thyroid assists in fixing that cartilage, while the cricothyroid muscle, with its origin at the lower border of the thyroid cartilage, *tilts the cricoid* and thus makes tense the vocal bands. A central lesion or one of the vagus above the origin of the superior laryngeal nerve must impair sensation as well as motion on the side involved, and affects the action of the cricothyroid (or thyrocricoid), as well as of the other intrinsic muscles.

The following case, which was seen by several specialists here and abroad, and recently under the care of Dr. Duel and

myself, offered peculiar problems and gave rise to more or less difference of opinion. The attacks of dyspnea were so alarming, and the space between the bands so contracted, that one observer urged immediate tracheotomy, which no doubt would have been done but for the resistance of the patient, who preferred death from asphyxia to wearing a tube. Up to the present time the result seems to have justified his decision.

The patient is a man of middle age, of good constitution and of rather nervous temperament. In childhood he was inclined to be choreic and has always been neurotic. He is moderate in his habits, but has been subjected to excessive nervous strain from various causes. He admits excess in alcohol for a year about four years ago. He had excellent health until six years ago when he had an attack of ptomaine poisoning. For a year following he suffered increasingly from tachycardia, dyspnea and vertigo, which had been present more or less for a long time previously. Soon after he developed sciatica, which was pronounced by one physician who examined him to be a precursor of tabes. A recent careful examination discovered nothing to sustain the suspicion. It cannot be learned what, if any, other grounds for the opinion then existed. About six years ago he contracted a chancre, which was followed by mild secondary symptoms, a few spots on the body and very slight and transient ulcerations in the throat. Specific treatment seems to have been carried out with care and thoroughness.

Nearly a year ago he was for the first time awakened one night from sleep struggling for breath. The dyspnea gradually subsided in a few minutes but left him in a state of extreme mental agitation and greatly alarmed his friends. In the middle of last summer after running for a train he had his first day attack of laryngeal spasm. During the last six months there have been twelve or fourteen repetitions, varying in severity and duration, and all but one or two coming on in sleep. Usually they occur in the early morning and are often attended by a dream of choking. Sometimes the attack is observed to follow exertion, excitement, or exposure to local irritation, but often no such relation can be fixed. Under ordinary conditions nothing unusual is noticeable, but after exercise there is marked inspiratory stridor. Breathing in sleep is said to be

excessively noisy. The voice is strong, although perhaps a little rougher than natural.

The picture in the laryngoscopic mirror is typical of bilateral paralysis of the abductors. The rima glottidis is converted into an antero-posterior slit. The vocal bands recede slightly on expiration, while on phonation they seem to be in perfectly normal position. There is a moderate grade of catarrhal laryngitis. In fact the mucous membrane of the upper air track generally is very relaxed and the uvula is extremely elongated. There is pronounced hyperesthesia of the pharynx and larynx. General condition is fair, but the patient is naturally perturbed by his strangling experiences and by what he has been told. The urine is slightly albuminous and contains a few hyaline casts.

In view of the specific history and the patient's aversion to tracheotomy it was determined to keep him under close watch and try the effect of medication. Inhalations of mentholized oil; 1-40 gr. of strychnia three times a day and increasing doses of potassium iodide comprised the treatment, and at the same time the patient was directed to rest much and talk little. The redundant uvula was excised after local irritation had been subdued. At first the iodide was rather disturbing, but by gradually increasing the dose it was possible in three weeks to reach a maximum of 180 grains in three doses in twenty-four hours. A single application of percutaneous faradism seemed to aggravate the condition and was not repeated. Under this regime there was manifest increase in space between the vocal bands and increased motility. This improvement has been maintained and the laryngeal attacks have decreased in frequency and severity. Further gain has been perceptible since suspension of all treatment some weeks ago. The movements of the vocal bands are still far from normal, but there seems to be ample breathing space and no reason to apprehend trouble. The patient himself volunteers the opinion that the whole disturbance is functional and independent of specific infection. It is certainly clear that the paroxysms are induced by mental perturbation rather than by physical exercise. For example the most recent and a rather violent one followed a day of extraordinary mental strain in a law court.

In studying this case the various modes of meeting the situation came up for discussion.

Four methods of dealing surgically with bilateral abductor paralysis have been proposed: (1) intubation, (2) ablation of the soft parts lining the voice box, (3) division or resection of the inferior laryngeal nerve, (4) tracheotomy. My experience is limited to the first and last. In the single case in which I resorted to intubation, one of bilateral paralysis in a young woman following extirpation of a goitre, the presence of the tube became so irksome after a few days that the patient insisted upon its replacement by a tracheal canula.

Removal of the crippled vocal bands through a thyrotomy wound is an expedient that relieves stenosis but destroys the voice. It is to be thought of, if ever, only in desperate cases in which there is no possibility of improvement, a conclusion to be rarely adopted.

On theoretical grounds the ideal procedure is resection of one recurrent nerve, whereby the corresponding band is placed in the *pathologic cadaveric* position and the voice is finally regained through compensating action of the adductors of the opposite side. No record of this having been successfully done is accessible. Practically it is found that *shortening* of the adductors results from long contraction without antagonism so that the band still keeps a median position (A. Cahn, Deutsche Arch. für. klin. Med. Feb. 22, 1903). It is possible that in some cases a portion of the innervation of the adductors is derived from the nerve of the opposite side, and in addition there may be more or less ankylosis of the cricoarytenoid joint. For these reasons division of the nerve is a failure.

Tracheotomy then remains the operation of choice, especially if the patient is to be beyond means of relief in case of urgent dyspnea. It is best done under local anesthesia. The rapidity of asphyxia in some of these cases is astounding. To my knowledge in one instance a patient left the office of his physician with apparently sufficient breathing space and fell dead on the sidewalk presumably from apnea, after having walked only a few blocks. On the other hand, most unexpected improvement has now and again been observed when the conditions seemed very unpromising. A case in point is recorded

by Glasgow in the third volume of our Transactions, in which complete recovery of one of the disabled vocal bands took place after the lapse of several years. In the same volume Sajous reports a case due to lead poisoning in which recovery took place in the course of nine weeks under potassium iodide and nux vomica. More recently a case has been reported by G. L. Richards (Journal of Laryngology, etc., Oct. & Nov., 1906) in a child two and a half years old. The stenosis came on after a succession of frights, became worse and in about two months a tracheotomy was required. The tube was worn for three months and then gradually withdrawn without return of symptoms.

The prognosis in abductor paralysis is less hopeless than is generally believed. Spontaneous recovery, improvement under medication, or a temporary tracheal canula, depending on the cause of the lesion, are among the possibilities. In a large proportion of cases a permanent tube is the only alternative, but if the patient can be kept within reach it is well to postpone this measure until all other resources have been exhausted. On general principles in a case of long standing there is less likelihood of restoration of function owing to degenerative changes in the posterior cricoarytenoid muscle, as well as fixation of the cricoarytenoid joint from protracted disuse.

*Candidate's Thesis.*LIGATION OF THE EXTERNAL CAROTID ARTERY,
CONSIDERED FROM A RHINOLOGICAL AND
PHARYNGOLOGICAL VIEWPOINT.

BY CHEVALIER JACKSON, M. D.

A review of the literature of rhino-pharyngology convinces the writer that the manifold uses of external carotid ligation and the ease and safety of its performance are not fully realized at the present day.

We are still laboring under the impression created in the preaseptic days that external carotid ligation is a serious operation. Many confound in their minds the more serious operations of ligation of the other carotids, internal and common, with that of the external. The latter is relatively a trivial matter.

INDICATIONS.

Ligature of the external carotid artery is indicated for forestalling or arresting hemorrhage from tissues, vascular supply of which is derived from that vessel. It is also of value in the inhibition of recurrence of benign and malignant neoplasms in this area, though this requires usually more than simple ligation and is not so certainly within the province of the rhino-pharyngologist. As such, we are more interested in its uses for the arrest of serious hemorrhage after tonsillectomy, and as a preliminary to extirpation of naso-pharyngeal fibromata and malignant disease of the nasal and naso-pharyngeal cavities, the maxillary antrum and the tonsils.

After *tonsillectomy* many serious and a few fatal hemorrhages have occurred. In nearly every instance the hemorrhage could have been stopped as if by magic by the ligation of the external carotid artery on the bleeding side. Of course, if the hem-

orrhage is from the cut end of a vessel of considerable size, the mouth of this vessel can usually be found and twisted in the tonsillar wound. Very often it will be found high up in the supratonsillar fossa and will only be exposed by pulling the anterior pillar forward with a hook made from a bent probe, or, still better, with Hubbard's pillar retractor. Hemorrhage in this locality has often been found by the writer in cases where the bleeding was said to be an oozing. In many cases, the bleeding comes from remaining glandular or cicatricial tissue, the vessels of which do not retract normally. In such a case, biting out the offending tissue will often stop the bleeding by permitting normal vascular retraction, or in other cases will enable the detection and torsion of the bleeding vessels. The tonsillar clamp may be applied, but few can wear it long, and it is not always efficient. A pad held in place by a hemostat will often serve to arrest the bleeding either permanently or temporarily while the ligation is being performed.

It is when these and other means fail that external carotid ligation is demanded, and it is wise not to waste too much time temporizing. When it is clear that the hemorrhage is not going to cease; or, having ceased, is very likely to recur in a case where recurrence would be dangerous, it is better to proceed at once to ligation.

After intranasal operations, such as turbinotomy, if packing the nose fails to stop the hemorrhage, an external carotid ligation is less painful and less dangerous than a posterior plug.

Fibromata of the rhinopharynx may be safely extirpated without danger after the preliminary ligature of one or both external carotid arteries. If the growth is distinctly of monolateral origin ligature of the corresponding external carotid is sufficient. If the growth springs from a broad base situated on both sides of the median line, bilateral ligation is necessary. In this class of cases it is better to allow an interval of a week between the two ligations.

The author has operated in eight cases of nasopharyngeal fibroma with preliminary external carotid ligation. Two of these have been already reported. In four I thought it necessary to insert a postnasal plug, in the other four it was not necessary. With the ligation of only one artery in a fibroma

of sessile base spreading to the other side of the median line, the hemorrhage was more profuse than the first gush after adenoidectomy, and it threatened to continue until the patient would have been exsanguinated; therefore, a plug was inserted. Ordinarily, preliminary ligation should permit completion of the operation. In one case, the operation had to be abandoned because only one common carotid was compressed with the finger. The external carotid had been ligated two years previously when the primary growth was extirpated. When it came to the operation for the recurrence, I made the mistake of not ligating the external carotid of the opposite side, depending upon digital compression of the common carotid artery (of the previously ligated side) upon an aneurism needle. Had the remaining external carotid been ligated, temporary compression of the common upon the side of the prior ligation would have obviated the abandonment of the operation before its completion. The boy was becoming exsanguinated, and a handful of gauze sponges were packed into the large nasopharynx. To persist a moment too long in these cases is fatal. Collapse comes on suddenly, and the patient bleeds into his own vessels without warning. It is almost impossible to restore vasomotor control.

When one looks over the appalling list of deaths upon the table from simple evulsions and severe preliminary operations for the extirpation of nasopharyngeal fibromata, or, when one has seen the blood welling up out of the mouth like a drinking fountain, while the surgeon is hurriedly tearing away as much as possible of the growth, the quiet, orderly procedure after an external carotid ligation is, by contrast, a revelation.

The inhibition of repullulation of nasopharyngeal fibroma from starvation owing to diminished blood supply is probable, though open to some doubt because of the rapid restoration of the blood supply. Exsection of the external carotid and a number of its branches as advocated by Dawbarn for malignancy would doubtless prevent recurrence of fibroma, but it does not seem justifiable in the benign condition, as recurrences are easily taken care of and life is not threatened.

Angioma. All that has been said of fibroma is equally true of angioma, in the pharynx, nasopharynx, nose, or fauces.

In malignant disease in the external carotid area external carotid ligation is of use in two ways: To forestall hemorrhage and to inhibit recurrence. If for the latter purpose, more than a simple ligation is necessary. Exsection of the external artery and all its branches is required, and not only on one side but both. However, this is a more formidable operation, with a higher mortality, probably six per cent. Simple ligation will prolong life a number of months, which may be of great moment to the patient, and it is a minor procedure which may be easily done under local anesthesia.

The malignancy which is particularly amenable to ligation is the sarcomatous form. It spreads by the vessels, whereas carcinoma spreads chiefly through the lymphatics and is, for this reason, less influenced.

As rhinologists, we are more interested in malignant disease of the maxillary antrum, and of the nose and naso-pharynx. In all of these locations, sarcoma may be retarded, and operation for the extirpation of either sarcoma or carcinoma rendered free from risk of hemorrhage, and from all necessity for haste. These advantages enable a careful extirpation of all diseased tissue, without which operations for malignancy in most instances are unjustifiable.

MORTALITY.

The mortality from cerebral embolism due to washing away of a portion of the clot extending backward to the bifurcation, and carried into the cerebral vessels through the internal carotid, is estimated by Crile at from two to three per cent. This is based upon reports in literature by all operators and represents operations for all conditions, including some in which the vessels themselves were diseased.

My own statistics show thirty-eight external carotid ligations without a death from any cause within a month, and without a single death at any time attributable directly or indirectly to the operation.

In all my cases, particular care was taken to ligate as far as possible above the bifurcation.

Attention to this point will doubtless lessen mortality. No

mention of the exact point of ligation is made in many published reports of cases.

Wyeth's statistics compiled in pre-aseptic days show only four and one-half per cent mortality from all causes.

Even taking the mortality at Crile's figures, two and one-half per cent, the operation is imperatively demanded. The mortality from hemorrhage in the external carotid area in a hemophiliac without ligation, according to the cases collected by the author, is 18 per cent. This included spontaneous as well as post-operative cases.

The statistics of operations in the pre-aseptic days are useless for determining the present mortality, hence advisability, of the operation. The surgeons of those days had to reckon with, besides sepsis *per se*, the secondary hemorrhage at the coming away of the infected, non-absorbable ligature.

Sequelae. The only after effect noted by the author in 38 external carotid ligations was insomnia and headache in one case. It was probably due to increased intracerebral blood pressure owing to the diversion of an increased flow into the internal carotid artery. Slight insomnia, too vague to be certain of, was noted in a few cases.

TECHNICS.

In technics, the author wishes to add a few suggestions to the classic descriptions in the textbooks.

The incision should be ample so that a sufficient length of artery will be exposed. It should be made from the level of the jaw downward along the sterno-mastoid muscle to the level of the first ring of the trachea. This will allow of ample room for exposure of the common carotid artery first. The common is followed upward to its bifurcation. This will prevent all chance of ligating the common in cases of anomalous anatomy. The finger of an assistant on the temporal pulse will distinguish whether the internal or external carotid is being temporarily compressed between the finger of the operator and the aneurism needle, but obviously it will not warn the operator against ligation of the common. The superior thyroid and even lingual may be given off from the common carotid, an instance of

which I have seen. This is equivalent to a high bifurcation, and, unless on our guard, the classic direction to ligate between the superior thyroid and the lingual will result in our ligating the common carotid artery.

The operation should be done under infiltration anesthesia when there is the slightest contraindication to general anesthesia. The author did one ligation with no anesthesia at all, the boy being so exsanguinated that the sensorium and its accessory mechanism could not functionate sufficiently to perceive a sense of pain. The perception of pain is greatest at the skin. This is completely prevented by infiltration into, not under, the skin, of a one per cent cocaine solution, which is made with sterile normal salt solution to which is added one drop of carbolic acid to the ounce. This is necessary to sterilize the cocaine because of the destruction of cocaine at the temperature of boiling water. After the skin incision, but little pain is produced in cutting down quickly upon the arteries with a sharp knife. A dry dissector is painful and should not be used, certainly not before the common sheath is exposed, and preferably not then.

Ordinarily, the pulsation of the arteries is easily felt, and the bifurcation can be palpated through some depth of overlying tissue. If the patient is exsanguinated, however, the pulsations may be so feeble as not to be felt until the artery is exposed.

If the ascending pharyngeal is of any size it is better to ligate it also.

In the after treatment it is only necessary to avoid circulatory excitants. All of the writer's thirty-eight ligations healed per primam.

In regard to the choice between permanent ligation and temporary compression by means of clamps as advocated by Crile, there are several facts to be considered. Temporary compression has the advantage that it may be applied to the common carotid, thus lessening the amount of anesthetic needed, because of the cerebral anemia. This is a safe and decidedly advantageous method when used as it is by Crile, with the patient in the head-up position, and wearing the Crile pneumatic rubber suit, by which the blood pressure of the patient

is under the absolute control of a skilled sphygmomanometrist.

For many operations this is the best of all methods, but it requires an equipment rarely available; which is, of course, no criticism upon the method itself. For the removal of fibromata of the naso-pharynx it has the disadvantage of requiring a post-operative post-nasal plug, to prevent secondary hemorrhage, immediately or remotely after the release of the carotid compression. Such a plug is only occasionally necessary after an extirpation done with the aid of external carotid ligation. It is especially likely to be needed if the origin of the fibroma is on both sides of the median line, and only one external carotid be ligated.

The objections to obliteration of a centimeter or more of arterial trunk in the ligation of the external carotid artery are more sentimental than real. Absolutely no harm is done to any tissue by the local anemia, which is of only a few weeks' duration. Any surgeon who has tried to starve a malignant growth by arterial ligation will realize how promptly collateral circulation is established. This choice, then, between external carotid ligation and common carotid compression for operative hemostasis narrows itself down to one point, namely, mortality.

Crile's compilation of operations by anybody and everybody shows a mortality from external carotid ligation of about two and one-half per cent from cerebral embolism. This is no basis for comparison with common carotid compression under the perfect technic of Dr. Crile himself and his corps of assistants trained in the use of special and elaborate apparatus, for the control of the circulation in the head-up position. The only statistics at present available are those of Crile. Up to July, 1905, he had no unfavorable results in temporary carotid compression in 51 cases. If common carotid compression with clamps, and with the accessory aid afforded by the pneumatic suit and sphygmomanometrist, were to be put into general use by anybody and everybody it would probably show a mortality of at least two and one-half per cent.

While it is, of course, desirable to reduce all operative mortality to the lowest possible limit, yet considering that the mortality of unoperated malignant disease is very close to one hundred per cent, the matter of two and one-half per cent seems

insignificant. Hence, if it came to no operation at all, or to external carotid ligation in a given case of operation for malignancy, the matter of two and one-half per cent mortality would be of little moment.

The author has used temporary compression of the common carotid by an assistant with the index finger which pressed the artery against an aneurism needle. The patients were in each instance in the Trendelenberg-Roser position; the operations were of short duration; compressions were only made during the stages actually needed, the artery being released meanwhile; and all the patients had had their external carotids ligated preliminary to an operation a year or more before. The hemostasis was efficient, and the result was favorable.

Hemostasis by cording the extremities as advocated by Dawbarn, has not been tried by the author, and therefore, cannot be here justly compared with external carotid ligation. Theoretically it would seem to involve little risk if the cerebral circulation be carefully watched.

These methods are of advantage to the general surgeon in all work upon the internal carotid area, but in the field of the rhinopharyngologist, who is mostly concerned only with the hemostasis of the external carotid area, it is a distinct disadvantage to diminish the cerebral blood supply. The author's opinion is that permanent external carotid ligation is safer for nose and throat operations, because it leaves the cerebral circulation unimpaired, while creating an anemia of the operative field. Not only is the cerebral circulation unimpaired, but it is probably improved by the increased amount of blood thrown into the internal carotid by the ligation of the external carotid.

REPORT OF CASES.

The author has ligated the external carotid artery thirty-eight times. A complete report of all would needlessly extend this paper. A few illustrative cases will suffice. As two instances of ligation preliminary to extirpation of nasopharyngeal fibromata have been published, none of these need be here reported in detail.

Summary of Cases. The author has ligated the external caro-

tid artery thirty-eight times in thirty cases, both arteries being tied in eight cases.

To arrest hemorrhage after tonsillectomy.....	7 cases
To forestall hemorrhage in extirpation of malignant disease of the tonsil and tongue.....	4 cases
To forestall hemorrhage in extirpation of malignant disease of the maxillary antrum.....	3 cases
To inhibit growth in malignant disease of the maxillary antrum	4 cases
To forestall hemorrhage in extirpation of nasopharyngeal fibromata	8 cases
To arrest spontaneous nasal hemorrhage.....	2 cases
To arrest postoperative nasal hemorrhage.....	2 cases

Almost fatal hemorrhage after tonsillectomy in a hemophile arrested by external carotid ligation. Dennis M., aged 20, was admitted to the Western Pennsylvania Hospital in an almost moribund condition. His relatives gave a hemophilic family history. They stated that he had had his tonsils removed four hours before and had been coughing, vomiting and expectorating great quantities of bright red blood ever since. He had fainted a number of times. Various remedies had been applied and, excepting chromic acid, without avail to the bleeding right tonsillectomy wound. When I saw the patient he was a typical picture of exsanguination. His pulse was imperceptible at the wrist, his heart beats uncountable on auscultation; his temperature was 96 degrees F. by axilla. His lips were as white as his face. He would faint away, then rouse, roll his head from side to side and in a whisper try to ask for water.

To lose another ounce of blood in such a state would mean certain death.

The patient gave no evidence of pain while, without any anesthetic, the author ligated the right external carotid artery. The operation required just six minutes. The pulse began to improve. An intravenous injection was given. The next day the case was gone over carefully and purpuric hemorrhages were found in the conjunctiva, skin and nasal and buccal mucosae. The most profound traumatic anemia from loss of blood was present. Hemoglobin 20 per cent. Red cells, 680,000. As 700,000 is supposed to be the minimum compatible with life, his condition may be understood. The carotid wound healed *per primam*, and ten days later the tonsillectomy wound had healed. One month after admission, the patient's general condition had improved sufficiently to walk home from the hospital. I have since been informed that he died subsequently of hemorrhage from the left nostril, which came on spontaneously

without operation or traumatism, proving the case one of hemophilia.

Fibroma of the spheno-maxillary fossa. External carotid ligation. Extirpation. Fibro-sarcomatous recurrence in the nasopharynx. Common carotid compression. Extirpation. Andrew D., aged 18 years, was admitted to the Western Pennsylvania Hospital for nasal hemorrhage for which his nose had been packed, the packing being still in place. For three years there had been a gradually increasing swelling on the left upper jaw and cheek. Within the last year the right nostril had closed and a foul, bloody discharge oozed from it, excoriating the nostril and lip. The jaws could be separated but slightly and mastication was difficult. On examination a very slight bulging inward of the right naso-pharyngeal wall was noted. There was a hard mass back of the maxilla in the sphenomaxillary and zygomatic fossae. The occlusion of the right nasal chamber seemed to be from the bulging inward of the antral wall posteriorly. The right side showed dark on transillumination, pus was flowing from the middle meatus, and I expected to find a malignant growth in the antrum. Palpation of the nasopharynx was impracticable because of the intolerance of the patient and fixation of the inferior maxilla, which could only be opened about one centimeter.

Under ether, palpation revealed the presence of a hard, immovable nodular tumor back of the right maxilla, to which it seemed tightly attached. I then opened the antrum and found it full of pus. It was very small from bulging forward of its posterior wall, the inner wall bulging inward. It contained no growth. I then ligated the external carotid artery. The superior thyroid and the lingual were found to spring from an axis, above which the external carotid was tied. Then the lingual was ligated. The tumor was dissected loose from the soft tissues, and with lion-jawed forceps I tore out its dense fibrous attachments to the periosteum of the sphenoid and maxillary bones. Notwithstanding the tearing away of the enlarged internal maxillary artery the bleeding was slight and it ceased soon after packing. The antrum was also packed.

Both the antral and the tumor cavities healed promptly, though the external and nasopharyngeal deformities remained. The boy was discharged. Clinically and microscopically the tumor appeared to be a pure fibroma.

Three months later the lad was readmitted and was found to have a large hard mass entirely filling the nasopharynx. It seemed to be attached to the right side, and was not so large as to impede mouth breathing. Under ether anesthesia, I exposed the common carotid, which an assistant compressed on an aneurism needle. The site of the previous external carotid

ligation was not laid open. I then proceeded with Stucky's forceps to tear away the naso-pharyngeal tumor which was too broad based for the application of a snare. The bleeding was so profuse that the boy was almost exsanguinated in a few minutes, which compelled me to abandon the operation before the growth was as completely extirpated as I would have liked. The lad recovered uneventfully, but a foul ulcerating surface persisted in the naso-pharynx.

The growth removed was reported by Dr. Ernest Willetts to be a fibrosarcoma.

Remarks. The mistake here made, from a hemostatic point of view, was in not ligating the opposite (left) external carotid. Then the compression of the right common would have effectually checked hemorrhage so that a complete and thorough extirpation of the nasopharyngeal tumor could have been made. As a matter of cure in this case, thorough extirpation would have been of no avail, for the mass proved to be malignant; but had the growth been purely fibrous, as the primary tumor was, the imperfect technic would have been a regrettable thing. In a similar subsequent case, I ligated the opposite external carotid, digitally compressed the common on the previously ligated side, and succeeded perfectly in keeping the bleeding within bounds until the operation was completed in an orderly manner.

Almost fatal hemorrhage after turbinotomy stopped by external carotid ligation. Paul S., aged 16 years, was referred by Dr. W. W. Jones for nasal stenosis and occasional epistaxis. At the Eye and Ear Hospital I resected both inferior turbinals, packing with bismuth lint as suggested by Freer. The packing was removed and the patient was discharged from the hospital on the third day. Eight days later after playing basket ball against orders, there was a profuse bleeding from both nostrils. He was readmitted to the hospital and both nostrils packed with bismuth lint by myself. The following day a profuse hemorrhage past the packing occurred from both nostrils. In my absence on an urgent call, fresh packing was placed by one of the staff. This completely stopped the bleeding for fourteen hours, when a profuse flow of blood, at least six ounces, occurred suddenly. The wounds were then sealed up with cotton and collodion by another member of the staff. This held well until the next day, when recurring hemorrhage demanded anterior and posterior plugging. Pulse 120 and soft. Patient

showed effects of loss of blood. Upon my arrival home, I found no bleeding past these plugs and decided to leave them *in situ* a total of twenty-four hours, notwithstanding a double acute purulent otitis media. In response to an urgent call to the hospital a few hours later, I found the boy almost exsanguinated from a profuse hemorrhage, and blood was still flowing freely. As another hemorrhage would have proved fatal, I decided to ligate the external artery, in which decision Dr. Jones and my colleagues on the staff concurred. Dr. Helen F. Upham made digital compression over the common carotid, while I did the operation in ten minutes under infiltration anesthesia, practically without pain until the common sheath was opened, when some twinges were felt. The ligature was placed between the superior thyroid and the lingual, as closely to the latter as possible. The bleeding immediately ceased. Plugs and packing were removed at once.

The otitis disappeared under douching, the pulse was just perceptible at the temporal artery in a week, and the boy made a complete and uneventful recovery without the loss of one drop of blood after ligation.

Remarks. Here is a case in which, probably owing to anatomical anomalies, profuse bleeding occurred in a rush past packing and plugs, placed, not by one man, but by a number of men. To have temporized longer with methods which were by this time proved useless for this particular case would have been fatal. The patient was already in traumatic anemia. Another torrential hemorrhage such as he had already undergone four times would have ended in fatal collapse.

Sarcoma of maxillary antrum retarded by external carotid ligation. Referred by Dr. Frank L. Todd. Mr. C., aged 38 years, had a rapidly increasing swelling of the left cheek with occlusion of the left nostril and a bulging downward of the roof of the mouth, all of which were first noticed by the patient six months before. For a few weeks prior to admission the bulging downward of the hard palate had been noticed to ulcerate. Upon examination the ethmoidal and maxillary sinuses of both sides and the sphenoidal sinus were found to be filled with a growth, which, clinically, seemed sarcomatous, and a microscopical examination of a specimen by Dr. Joseph H. Barach proved it so to be.

The growth being manifestly inoperable, and the patient being anxious for a few months of life in which to arrange his affairs, I ligated both external carotid arteries between the lingual and the superior thyroid. Each operation required but fifteen minutes.

No pulsation could be felt in the temporals for seven weeks. For three months the progress of the growth was apparently arrested. Then it began slowly to increase in size, but at no time did it reach its former rate of growth. It proved fatal about a year after the ligation.

Remarks. While the author realizes that the rate of growth is subject to intervals of arrest and progression, yet, this and other cases seem to point to a halting of two months or more from simple ligation of both external carotids without exsection. Of course, exsection of the artery and the tying off of its branches would retard progress still farther, yet it is a more serious procedure, and as we are doing only a palliative operation, the slighter the better. In addition to retardation of the growth, relief of pain and freedom from hemorrhage can be promised.

SUMMARY OF CASES.

The author has ligated the external carotid artery thirty-eight times in thirty cases, both arteries being tied in eight cases.

To arrest hemorrhage after tonsillectomy, 7 cases.

To forestall hemorrhage in extirpation of malignant disease of the tonsil and tongue, 4 cases.

To forestall hemorrhage in extirpation of malignant disease of the maxillary antrum, 3 cases.

To inhibit growth in malignant disease of the maxillary antrum, 4 cases.

To forestall hemorrhage in extirpation of nasopharyngeal fibromata, 8 cases.

To arrest spontaneous nasal hemorrhage, 2 cases.

To arrest postoperative nasal hemorrhage, 2 cases.

EPITHELIOMA OF THE LARYNX; TOTAL LARYNGECTOMY, INCLUDING THE REMOVAL OF PART OF THE TRACHEA. DEATH FROM PNEUMONIA ON THE THIRTEENTH DAY.

BY CLEMENT F. THEISEN, M.D.

(Read by Title.)

This case is reported, because it emphasizes the point brought out by Delavan in a paper read at a meeting of this Association (Recent Advances in the Treatment of Malignant Disease of the Larynx. 1904), that *early* radical operation offers the only reliable prospect of cure in cancer of the larynx. It brings out another point so often raised by Mackenzie in discussions upon this subject, that microscopical diagnosis of cancer of the larynx is often difficult and that the laryngologist may be misled by his pathologist, and valuable time lost.

There is no doubt, however, that the fault is often the laryngologist's, for not cutting deeply enough into the growth when he removes a piece for microscopical diagnosis. It is well known that a laryngeal growth may not show malignancy on the surface, and still be malignant. This question has been so thoroughly discussed at meetings of this association that I will not go into it any further. I will say, however, that in my own case it would have been better, and the patient would have had a better chance if the radical operation had been performed just as soon as the naked eye diagnosis of cancer was made.

I *did* make that diagnosis, but when several pieces were removed for microscopical examination, and the report came back that the growth was not malignant, I felt doubtful of my diagnosis and so lost much valuable time.

I have no doubt at all that the removal of pieces of the growth for examination, was probably responsible for the very rapid extension of the disease subsequently.

Mr. F. M., aged 57 years, was referred to me by his physician, with the history, that for several months he had been hoarse, but that his general condition had been very good. I first saw him last September. On examination, the nose, nasopharynx and pharynx showed practically normal conditions. On laryngeal examination, however, a rather flat, somewhat nodular, firm growth, involving about two-thirds of the left vocal cord, was seen. This presented very much the appearance of multiple, small, papillomatous excrescences. The left ventricular band was somewhat reddened and thickened, as was also the mucous membrane in the left arytenoid region. The right cord was slightly reddened, but was smooth and otherwise normal.

On October 3, several small pieces of the growth were removed with cutting forceps, and sent to the Laboratory for microscopical examination.

The report came back that the growth was not malignant, and was probably of an inflammatory character. My original clinical diagnosis was carcinoma, but thinking that I must be mistaken, and after talking the matter over with his physician, we decided to use for a time palliative measures. There was no involvement of the cervical lymph nodes so far as could be determined.

The patient was under my observation for a number of weeks after this and improved somewhat. I then did not see him until January 14 of this year. He had been having considerable dyspnoea, and was breathing with some difficulty when he came into my office. The growth had extended very much in the interval, involving the whole left cord, extending below the cords, and the right cord also showed evidences of a new growth. The condition now was so clearly malignant and the dyspnoea was so great, that I performed tracheotomy, using equal parts of a sterile solution of 1 per cent cocaine and 1-10,000 adrenalin.

This solution I have used in a number of tracheotomies in adults, and it has given uniformly good satisfaction.

I told him that a radical operation still offered him some chance, but it was not until three weeks after the preliminary tracheotomy that he would consent to this. A total laryngectomy was performed in the Samaritan Hospital in Troy, and for a week the patient got on very well.

The method that has been advocated by Gluck, working from above downward, was followed. Because the growth had extended into the upper part of the trachea, the trachea was removed with the larynx, for some distance below the site of the preliminary tracheotomy, the severed trachea being stitched to the skin. Chloroform was administered through the tracheotomy tube during the operation.

The patient was given no nourishment by the mouth for several days after the operation and for a week got along very well. He then developed a pneumonia and died on the thirteenth day after the operation.

The operation was performed in conjunction with Dr. Harvie, of Troy, attending surgeon of the hospital.

The pathological report is as follows:

Samaritan Hospital, Feb. 9, 1907.

Gross description: The specimen consists of a larynx. On its anterior surface just below the thyroid cartilage a small portion of skin is attached, in the centre of which is a sinus communicating with the trachea below the larynx, the result of a tracheotomy. The walls of the sinus are lined with granulation tissue. The inner opening into the trachea is about 1 cm. in diameter, and much larger than the surface opening. By looking into the larynx from above, a vegetative growth is found on the vocal cords, particularly on the left side and the cords seem partially fixed. After sectioning the larynx posteriorly in the median line, the left side is found to be almost completely covered with a whitish, minutely nodular, fungoid growth, of firm consistency. The growth extends to the right side also, but involves only the anterior third of the right vocal cord. The central portion of the growth is softened and somewhat degenerated, the advancing edges elevated and hard. No regional metastases are found.

Anatomical diagnosis: Epithelioma of the larynx.

Microscopic appearance: The surface epithelium at the margin of the growth is of normal appearance; its transition into the malignant growth can be definitely demonstrated in the sections. The growth itself is entirely of epithelial origin, and consists of irregular columns or spheres of epithelial cells, growing into the underlying tissue in all directions. The cells are cuboidal or round, of large size with a pale straining nucleus, and many mitotic figures can be seen. The marginal cells are more closely packed, and resemble in their arrangement the stratum Malpighii in the epidermis. The growth shows a tendency to rapid degeneration in the centres of the columns and spheres, for frequently the cells are replaced by granular detritus. The interstitial connective tissue is thickly infiltrated with small mononuclear leucocytes and plasma cells, and in some areas there is a proliferation of the small capillaries. The hyperplasia of the connective tissue is definite, and has the appearance in places of granulation tissue. No metastases could be found.

Revised diagnosis: Epithelioma of the larynx.

H. W. CAREY.

Gluck has had undoubtedly by far the largest experience in total laryngectomy for malignant disease of the larynx, and has had the most successful record—considering the large number of operations he has performed.

Recently Chevalier Jackson (*British Med. Journal*, Nov. 24, 1906) has reported eight total laryngectomies, with no operative mortality. One of his patients lived seven years after the operation, and one case lived three years without recurrence, dying of cerebral hemorrhage. One patient lived eight months, dying of alcoholism. Of the remaining five, three recurred within a year, one apparent cure was lost sight of and one was too recent to record.

Preliminary tracheotomy seems to be advisable, although Keen, without preliminary tracheotomy, severs the trachea and stitches it to the skin as the first step, after exposing the larynx and trachea. This method of stitching the trachea to the skin was also successfully employed by Solis-Cohen in his well known case.

In conclusion, the writer would say that in his case the delay occasioned by the favorable report of the pathologist was certainly injurious to the patient. An early thyrotomy might have been performed, with a much better chance for the patient. In such doubtful cases, it would seem best to depend upon the naked eye diagnosis of cancer and go ahead with the operation immediately.

The removal of pieces of the growth for microscopical examination, is not always wise, because if only small pieces are removed from the surface of the growth, the examination may not show malignancy.

SARCOMA OF THE PHARYNX IN A CHILD OF
EIGHT YEARS, WITH AUTOPSY FINDINGS
AND MICROSCOPICAL REPORT.

BY CLEMENT F. THEISEN, M.D.

Read by Title.

A search of the literature of the past twelve years, revealed the fact that sarcoma of the pharynx in young children is so rare that the writer considered the following case worth placing on record:

A. S., a girl aged eight years, was referred to the writer on January 11 of this year, with the history that for several months there had been an increasing difficulty in breathing. The child's parents are living and well, and there are five other perfectly healthy children in the family. The child's great-grandfather is said to have died of cancer of the throat. The child had lost weight rapidly and was in bad general condition.

Examination of the throat showed the presence of a large mass including the soft palate, and pushing it forward. The growth extended downward almost to the epiglottis, and apparently into the naso-pharynx, although this could not be examined, as the finger could not be carried around and back of the growth. There was a constant discharge of an offensive muco-purulent material from the left nostril.

The mass was firm to the touch, and did not show any evidence of breaking down. There was some involvement of the glands, particularly of the left side of the neck.

Dr. Elting, of Albany, a general surgeon, saw the case with me, and agreed that the tumor was inoperable. The child was admitted to the Childs' Hospital on January 14 and it was decided to try mixed toxins (erysipelas and bacillus prodigiosus—Coley's serum), following the method advised by Coley (Journal American Med. Assn., March, 1906). A piece of the growth was removed for microscopical examination, and sent

to the Bender Laboratory, with negative results. Here again, although a fairly large piece was removed, we probably did not go deeply enough to show the malignant character of the growth. Clinically, however, there was no doubt at all about its malignant nature.

The injections of the serum directly into the mass were started a few days later. We started with m. i-3, increasing m. i or more each time. We got no reaction until January 25, after the injection of m. iii into the mass. Temperature rose to 103.4 degrees F., pulse 136. On the following day the temperature was down to 99 degrees F.

There was another reaction (temperature 102 degrees F., pulse 160), after the use of m. iv of the serum. On February 3 a hemorrhage from the nose and throat, lasting about an hour, occurred, and was controlled with adrenalin and ice.

The amount of serum was steadily increased, and another reaction (temperature 102.6 degrees F., pulse 140) obtained, when m. viii were injected. Reactions were also obtained when m. xiv and xvi were used. The injections were given at first every other day and finally every day, as much as m. xx being used.

The patient breathed with difficulty during the night of March 4 and died on the morning of March 5. Adrenalin injections were not used in this case, because the method is slow, and the child's condition was so bad that we thought prompter results would probably be obtained with the mixed toxins. Iodide of potash had been used without any result, and had to be stopped because it greatly increased the difficulty in breathing, by producing an oedema of the mucous membrane.

For a few weeks after the serum injections were started the child appeared to improve, the breathing being easier, and the growth apparently becoming a little smaller.

On the whole, however, in this case at any rate, the use of Coley's serum did not do any good. It certainly did not produce the slightest softening of the growth. The autopsy findings were as follows:

The Bender Hygienic Laboratory.

Name, Anna S. No. 0-1108. Date, Mch. 6, 1907.

(Dr. Robinson.)

Age 8 years. Child's Hospital. Service of Dr. Theisen.

CLINICAL DIAGNOSIS—Sarcoma of soft palate.

Body is that of a fairly well-built, poorly nourished female child, measuring 123 cm. in length. Rigor mortis absent. Pupils unequal, the right being dilated and measuring 5 mm. in diameter; the left contracted and measuring 1.5 mm. in diameter. A ptosis of the left upper eyelid is present. The cervical lymph nodes on both sides, but especially on the left, are enlarged and readily palpable.

On exposing the abdominal cavity, the intestines are seen to be distended with gas, the appendix is bent on itself and bound to neighboring tissue by firm fibrous tags. The mesenteric lymph nodes are apparently normal. *Pleural cavities*—normal; *Pericardium*—normal; *Heart*—normal; *Lungs*—normal; *Liver and gall-bladder*—normal; *Spleen*—normal; *Stomach and intestines*—normal; *Kidneys*—normal; *Adrenals*—normal; *Pelvic organs*—normal; *Aorta*—normal; *Neck*—the left lateral aspect of the neck downward from the left ear is slightly prominent and some enlarged lymph nodes are felt. The mouth is two-thirds filled, principally on the left side, with a firm, globular growth attached more at the left side, of the junction of the soft with the hard palate, which extends from there to the side of the cheek down along the side and back of the pharynx on the left, and is most intimately adherent to the left side of the pharynx, especially to the pterygoid process and as far down as the gullet. The tongue fills the lower part of the oral cavity and the growth the upper part. Both meeting tangentially as two spheroids, make it appear as if the communication with the pharyngeal opening was obliterated, but the obstruction is only apparent, and a finger can be readily introduced between the tongue and tumor into the pharynx.

By incision along the oral attachments of the tumor and by loosening up the pharyngeal attachments the trachea, larynx, œsophagus and tongue can all be removed with the growth.

The tumor consists of a pinkish-white, roughened, irregularly lobulated mass of tissue measuring about 7x4x4.5 cm. It involves the entire soft palate, the pillars of the fauces on both sides, the left side of the pharynx from the pharyngeal vault, downward to a level with the epiglottis, the lower and right hand portion filling in the space above the epiglottis, but being

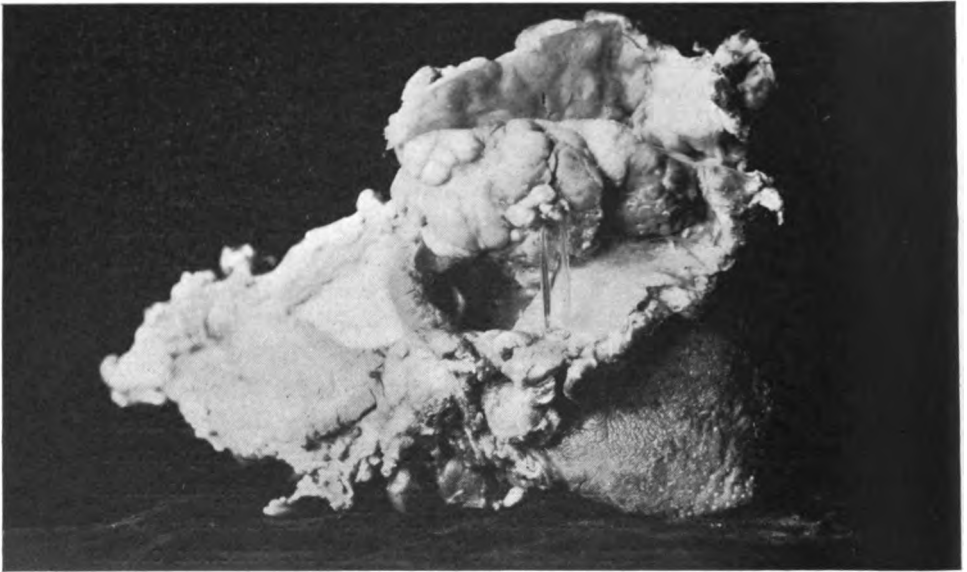


Fig. 1. Sarcoma of Pharynx.

free and unattached in this part, the attachment on the left side supporting the growth.

On section the surface is homogeneous in appearance, with no coarse connective tissue stroma, but apparently very cellular. The tissue is glistening and semi-translucent, of uniform consistency and of an elastic nature. On a level with the upper margin of the thyroid cartilage and to the front of the lateral border of the mass above described is a smaller, but similar mass measuring 3x2.5x2.2 cm., probably a group of enlarged cervical lymph nodes.

ANATOMICAL DIAGNOSIS—Sarcoma of pharynx. Enlargement of cervical lymph nodes. Chronic periappendicitis.

MICROSCOPIC DESCRIPTION—Sections through the tumor show tissue which in most parts is densely cellular. The cells have deeply staining, somewhat vesicular, oval or spindle shaped nuclei with little or no intracellular substances. In places the cells are arranged in fascicles, which cross and interlace, and here the structure is less dense than elsewhere. Con-



Fig. 2. Sarcoma of Pharynx.

nective tissue trabeculae penetrate in various portions, and oedema of some areas is present. Blood vessels are abundant and fairly well formed. The enlarged lymph nodes in connection with the tumor do not show an invasion by the growth. A marked hyperplasia of the lymph follicles and lymphoid elements exists.

MICROSCOPIC DIAGNOSIS—Spindle-celled sarcoma with hyperplasia of neighboring lymph nodes.

J. O. ROBINSON.

The following case reported by Halsted (Trans. Amer. Laryngol. Rhinol. and Otol. Soc., 1897), was somewhat similar to the writer's.

Emma R., aged two years, was brought to consult him on May 6, 1896. The child's respiration was labored, noisy and rapid, skin of the face of a milky pallor, with marked cyanosis, and the child was only partially conscious of its surroundings.

On examination, the right side of the nose was seen to be occluded by a growth projecting externally. Left nostril was also occluded. The soft palate was pushed forward by a mass presenting itself in the oro-pharynx. There was no ulceration. The child's dyspnoea was so great that Halsted performed tracheotomy almost immediately. Twenty-four hours later there was a hemorrhage through the tube. The child took no nourishment and died two days after the operation. A histological examination of the specimen obtained at autopsy showed it to be a sarcoma.

Melville Black (Colorado Medical Journal, April, 1901) has reported a case of papilloma of the soft palate, turning into sarcoma, in a child eleven years old. Two large tumors of the soft palate were removed, which microscopically were reported to be papillomata. There was a recurrence four weeks after the operation, and an examination then showed the tumor to be a round-celled sarcoma. Child died.

Another case of round-celled sarcoma of the pharynx has been reported by Hanzel (Ver. d. Wiener laryngol. Gesellsch., Jan. 9, 1902) in a child three years old. The author states it developed as a phlegmonous angina.

Schmidt has reported a case of sarcoma of the soft palate in a boy twelve years old. A radical operation was performed, but the final result is not given. (Adolf Schmidt. Alveolarsarcom des weichen Gaumes. Munch Med. Wochenschr., Nov. 10, 1894.)

A case of fibro-sarcoma of the naso-pharynx has been reported by Mermet (Soc. Anat., Paris, July 14, 1894). A tumor as large as an egg, probably originating in the inferior turbinate, posteriorly, hung down into the pharynx. It occurred in a girl 16 years old.

Another case in a girl of the same age, was observed by Simpson (Tr. Amer. Laryngol Assn., 1893). This was a sarcoma of the soft palate, and another example of the degeneration of a benign into a malignant growth. The soft palate was removed. Death resulted eight months after the operation, and over two years after the development of an apparently benign growth.

To consider briefly now the result of the treatment of sarcoma of the pharynx in children, the outlook, judging by the reported cases, is not very promising.

W. B. Johnson, however (N. Y. Med. Record, 1894), has reported a case of sarcoma of the palate successfully treated with the toxins of erysipelas. The patient, a girl, 16 years of age, had a sarcoma involving the soft palate, posterior wall of the pharynx and epiglottis. The mixed toxins were used and after nine months' treatment great improvement resulted. The growth "nearly" disappeared.

Hanszel (Monatschr. fur Ohrenheilkunde, Nov. 19, 1902) also reports a case of improvement in a sarcoma of the pharynx as the result of a streptococcus and staphylococcus infection.

Sarcoma of the pharynx in adults is not considered in the writer's paper.

Emerson has recently reported a case in an adult, in which the use of Coley's toxins resulted in the practical disappearance of the growth. There was a recurrence and death after seventeen months (Laryngoscope, March, 1907).

There are also several cases on record in which the arsenic treatment resulted in some improvement. I could not find any record of its having been used in sarcoma of the pharynx in children.

Candidate's Thesis.

IS THERE AN IDEAL OPERATION FOR THE CORRECTION OF DEVIATIONS OF THE NASAL SEPTUM.

BY JOSEPH S. GIBB, M. D.

Ever since Rhinology has taken its place among the special lines of study, septal deformities have been of all-absorbing interest. That the subject is not of easy solution is manifest from the innumerable operative precedures suggested for the correction of the same—procedures which are along divers lines.

A casual glance at the long list of measures suggested and the description of the defects to be corrected, convinces one of the utter lack of unanimity of opinion.

Almost every author views the septum and its displacements from a different standpoint, hence descriptions vary. To one unfamiliar with rhinologic lore it would be difficult to recognize in any two descriptive operative measures designed to correct the same deformity much similarity in the preliminary description of the anatomic or rather pathologic position of the parts. For example, the description of the common forms of deviation as portrayed by Killian would scarcely be recognized as the same as those of Freer. Hajek looks at a septal deformity very differently from Krieg or Boennighaus.

What does such a lack of uniformity indicate? Surely not a want of accurate knowledge on the part of these men. They are all careful, conscientious, painstaking and patient workers in the field of research. Rather does it show that the form the septum may assume, because of interference with the proper and normal development, or as a result of traumatism is so varied as to baffle accurate description. Doubtless each observer sees just the condition he describes, and just as truly no one sees them all. While it would be a matter of incalculable

value to have a description which, while simple, would cover every possible shape and form the septum may assume, because of conditions which prevent normal development or distort it after it has been so formed, still the practical point, which is too frequently overlooked, is to determine in what manner the distorted septum interferes with the proper function of the nasal chambers. It matters little from a practical standpoint whether the deviation is bow-shaped, S shaped, horizontal or vertical.

It is, however, a matter of much importance whether or not the deviation is in such a position or of such shape as to interfere with nasal respiration, or to obstruct the outlet from the various sinuses, or exert pressure upon sensitive nasal nerves. As indicated above no one description can possibly serve as a guide for the study of septal deformities. The modern rhinologist must learn that each case is a law unto itself, and must be carefully and closely studied, and if operative interference is demanded at all, that one selected which will give the most reasonable prospect of restoring, not the septum, but the nasal chambers, to their normal functions. In order to accomplish this it is quite as important, perhaps even more so, that the posterior as well as the anterior portions of the chamber be the subject of investigation. Not infrequently we find marked deviation of the bony structures, either of the perpendicular plate of the ethmoid or of the vomer even to the point of complete nasal obstruction, while the cartilage remains little if any out of its normal position.

It would seem in these days, when rhinologists have gone operation mad, an unnecessary refinement to point out or caution against the possibility of overlooking deformity in this body. Rather would we subserve the best interests of our art by uttering a word of caution against indiscriminate and unnecessary operation.

In this particular the writer is in entire accord with those who sound a note of warning. *Swain has in graphic language refreshed our minds as to the real functions of the nasal cham-

*Swain, *Annals of Otol., Rhinol. and Laryngol.* Vol. XV, 1907, page 968.

bers and given a word of warning as to the danger of our becoming nasal carpenters.

It seems to the writer that in the nasal chambers as in other portions of the human frame, the point to determine is whether or not the malformation interferes with the function of the part, and if it does what operation is best calculated to overcome the difficulty. If we have conscientiously settled this point we have gone a long way toward doing our patient a service.

In reviewing the operations which have been from time to time advocated to correct deviations of the septum, one is struck with the varied objects these operations have in view. The early operations, e. g., the stellate punch, Robert's pin, Harrison Allen's supra-labial and others, had but a single object, namely, to bring into a straight line a cartilaginous septum which from causes known or unknown had deviated from this position. With the possible exception of Allen's operation these methods took no thought of the bony septum or considered the presence of redundant tissue the result of inflammatory action. At the period these operations were in vogue little attention was given to the deeper nasal tissues. Enough was accomplished, it was thought, when the cartilaginous septum was brought into a position near the median line.

Later operations, designed by Asch, Watson, Gleason and others of the same general type, sought in addition to correcting the position of the cartilage to make an effort to obtain the same result also with the bony structures which were known to have suffered as much as those more anterior. Also these operators saw the necessity in order to secure substantial results of taking into consideration the redundant cartilaginous and bony tissues which filled in the concavity of a deviation or surrounded the site of a fracture, usually situated at the junction of the cartilaginous and bony framework. An effort was made to dispose of this redundancy of tissue in such a way that it would not obstruct the respiratory channel.

In all these earlier methods the desire of the surgeon was to effect a readjustment of the displaced parts with as little destruction or removal of the normal tissues as possible.

The object was much the same as the general surgeon has in view who endeavors to correct vicious union in a long bone

by refracturing it and replacing the fragments in as nearly a normal position as is possible to get them.

The modern operation—the sub-mucous resection—as practised by its many advocates—notably Killian, Hajek, Krieg and Boennighaus in Europe, and Freer, Ballenger and White in America—is designed upon totally different lines from all former septal operations. This method sees in the distorted tissue, be it cartilage, bone or adventitious product, the result of inflammatory action—an obstruction to be removed—and if it interfere with nasal function it is resected from between the layers of the overlying mucous membrane.

In this rapid and cursory review of the salient features of the operations designed for the correction of deviated septa, it will be seen that all the older methods sought to preserve intact the septum.

The modern operation—the sub-mucous resection—has no such object in view. The septum is regarded as the offending body and no effort is made to preserve it. Claims are made that from an anatomic or physiologic standpoint this tissue is unimportant, and hence no harm will result from its ablation. Therefore, if it is necessary in order to secure a free and unobstructed naris, the cartilage or bone be removed, this is done without hesitation.

With a view of ascertaining the advantages of the sub-mucous operation, the writer began the use of this method about two years ago.

Previous to this period each case was studied in its entirety and that operative procedure employed which seemed to offer the best opportunity of restoring the nasal chambers to their normal functions.

The desire in view was to accomplish this result with as little interference with the structures as was possible. In cases in which the removal of an enchondrosis or exostosis gave promise of obtaining sufficient space to secure good nasal respiration or relieve pressure, this simple operation was done, and the septum undisturbed.

If, after a careful study of the case, it did not seem possible to secure the result by the simple manner detailed, then one

or other of the various operative procedures upon the septum in vogue at the time were employed.

In the earlier years the Robert's or Adams' operation and later the Asch, Watson, Gleason, or those of the same type, were among those selected.

While complete success did not always crown our efforts, still there was a fair measure of it.

In a paper* upon this subject, read at the American Medical Association, in June, 1904, the writer selected 100 cases and tabulated the results as follows:

Total number of Asch operations.....	65
Total number of Watson-Gleason operations.....	23
Total number of Spurs removed operations.....	12

Of Asch operations:

The result was good in.....	47
The result was fair in.....	11
The result was failure in.....	3
The result was unknown in.....	3

In one case of failure by the Asch, a successful result was obtained later by the Watson-Gleason.

Of the twenty-three Watson-Gleason operations:

The result was good in.....	19
The result was fair in.....	3
The result was failure in.....	0
The result unknown.....	1

There were twelve cases in which it was deemed sufficient to remove only an exostosis or enchondrosis, and of these all were successful.

It was not claimed that a perfectly artistic result was secured, that the septum was made to follow an absolutely straight line, but what seemed to the writer more important in those cases marked with good result, the respiratory function of the nasal chamber was restored or pressure removed or both.

In passing it is to be noted that of the forty-seven Asch operations nearly all were plain cartilaginous deviations, while the Watson-Gleason were combined osseo-cartilaginous.

Since the writer first began the use of sub-mucous resec-

*Gibb, J. S., Deviation of the Nasal Septum—A Review of 100 Operations for Correction. Trans. Sec. Laryngol., Am. Med. Assn., 1904.

tion method, he has employed it in twenty-five cases—not a large number, to be sure, but sufficient to form a basis for comparison. In many respects this method is immeasurably superior to any operation which has yet been devised for the correction of deviated septa; that it is a perfectly ideal operation and adapted to every septal deformity the writer does not admit. This method far surpasses any of the older ones in the simplicity of the after-treatment. Again it is superior for the reason that when skillfully performed it ensures a perfectly straight septum, one that cannot possibly revert to its former faulty position. These are weighty arguments in its favor.

However, there are equally strong arguments against the universal application of this method. (1) It is an operation difficult to execute and success will result only in skillful hands. (2) It requires for its accomplishment a much longer time than is necessary for any of the older methods. (3) Which is dependent upon (2), it is a severe strain upon the endurance of both the patient and the surgeon. None of these criticisms are offered to disparage the operation, but merely to compare it with less radical procedures in those cases in which it might be thought feasible to employ mild measures.

The writer disclaims any spirit of harsh criticism of this method, and he doubts that serious consideration would be given him if he did, since praises are raised to the method in every medical journal, book and society in the land. The operation has come to stay and is an immense advance in our knowledge of septal surgery. It is believed, however, wise to sound a note of warning against the indiscriminate use to the exclusion of all other and well-tried plans of septal improvement.

In skillful, judicious hands it will prove a great boon to suffering humanity. In unskilled, bungling ones it will be a curse.

Already cases are coming to our notice in which this operation has been attempted which would have been better had no operation been performed.

Teachers assume a grave responsibility when they recommend this operation to their classes without at least a word

of warning as to the difficulties, and, perhaps, coupled with the advice to the tyro to first perfect himself in the technique upon the cadaver or lower animals.

From the fact that from time to time new operations have been designed to correct septal deformities, it may be well argued that previous attempts had not given universal satisfaction. As with incurable diseases the number of remedies are legion, so with deformities of the septum, surgeons have not been satisfied with the efforts of their predecessors, and have ever striven to design a method that would be ideal—hence the number of operations have multiplied in the effort to attain this goal. Has this Utopia been reached? The advocates of the sub-mucous resection method believe that it has and that every conceivable form of septal malposition may be corrected. Doubtless in extra-skillful hands this statement is strictly true—but it is only a partial truth as to the claim that the operation is ideal. Granted that in the hands of a master, a deviation may be dissected out from its encompassing mucous membrane, it may not always be the part of wisdom to so dissect it. For example, it is no uncommon experience to find a septum deviated only in its posterior bony portions. The perpendicular plate of the ethmoid, the vomer and the maxillary crest, each or all participating in the deformity, and the latter surrounded by new tissue, the product of inflammatory action, either cartilage or bone, according as one or other of these tissues are the site of the initial inflammatory process, may each form a mass which entirely prevents free nasal respiration. Given such a case, is it the part of wisdom to remove a perfectly normal tissue, one that is in no wise productive of harm, in order that an offending obstructing mass may be reached and removed? This question could well be answered in the affirmative if there were no other way, but that this is not the case is attested by the army of rhinologists who have successfully laid siege to and conquered these conditions long before the advent of the sub-mucous method. Force, again, is added to the argument against the wanton destruction of normal tissue from the fact that all the advocates of the new method admit the exceeding difficulty of stripping the muco-periosteum in the posterior deviations.

So peerless an operator as Freer* advises the operator to persevere with the resection of the bone at this point and not allow the fear of a tear of the mucous membrane or a perforation cause him to desist in his efforts. The older methods could do no more injury than tear the mucous membrane, or cause a perforation, and in the latter method the septum would remain intact, a very important consideration, notwithstanding the assertion that the cartilaginous septum plays but a feeble rôle in sustaining the tissues of the bridge.

Of course in those cases in which the bony deviation is associated with a marked cartilaginous bend, these criticisms would not be relevant, since the one may not be satisfactorily corrected without the other, and it would seem wiser to allow one operation to suffice for the entire deformity. But even in this latter, in consequence of the extreme difficulty in effecting thorough stripping of the periosteum from the bone, the embryo or unskillful rhinologist had better select some less difficult, though perhaps also less efficient, method until he has acquired sufficient skill to make a successful result measurably sure.

Nor is this particular type of deviation the only one in which the sub-mucous resection operation appears an unnecessarily harsh one. A very common deviation is a bowed cartilaginous septum with no change in the bony structures.

It is at once admitted that these are readily corrected by the sub-mucous operation, and that they are comparatively easy of execution. But it is also just in these cases that any one of several of the older methods of operating has scored signal successes.

It is believed that the poor results of the older methods which seemed to necessitate the application of newer and better means arose from a lack of appreciation of the influence of the bony structures in reproducing deformities which were believed to be thoroughly corrected.

Further, the writer believes that were deviations confined alone to the cartilaginous septum, the older methods would

*Freer, *Ann. Otol. Rhinol. and Laryngol.*, Vol. XIII, June, 1905, page 242.

have sufficed and there would be no need of the sub-mucous resection.

In this type then, while it is conceded the sub-mucous operation gives excellent results, it seems to the writer that at least, in properly selected cases, it is an act of folly to discard these methods which have served us so well in the past—and that it is better surgery to save the cartilage and effect by simple means the results we desire.

Shall we then abandon all our old methods for the correction of septal deformities, and adopt only the new? Have we an ideal operation?

If we are correct in our premises that the subject of septal deformities is so complex as to baffle accurate description as to the conditions to be overcome, manifestly no one operation can be relied upon to correct them. For a quarter of a century measures have been employed with more or less success. We should with this experience have been taught lessons which should enable us to determine in what class of cases success might be looked for, and those in which success seems improbable, adhering to the old methods in the former and relegating the latter to the newer.

An effort has been made to point out a few conditions in which it is believed as good success may be attained, with less destruction of tissue, by the older methods. There are many others. In view of the multiplicity of abnormal shapes and positions a deformed septum may assume, each case must be a study in itself, and the surgeon select that operative procedure which his experience and individual judgment have taught him is best suited for that particular case. While it is admitted that many, if not all, deviations may be corrected by the sub-mucous resection, it is denied that it is a good surgical procedure to resort to it in every case.

Therefore, it is believed to be unwise to abandon all the labors of our predecessors, many of which have stood us in good stead in the past, and take up with new. Rather does it appear more judicious to welcome the new as a great addition to our means of attacking this difficult and intricate subject, helping us out of many difficulties in which we were formerly

helpless, but at the same time to hold fast to the old, well-tried and satisfactory methods.

The writer trusts he has been able to make himself perfectly clear on the points at issue. He disclaims any desire to disparage or attack the sub-mucous operation. On the contrary he has been filled with admiration with the conception of this operation and with the results obtained in the hands of the little band of expert operators throughout the world who have enthusiastically advocated its claims. The thought is that harm will surely result from an indiscriminate endorsement of this truly brilliant procedure unless an attempt is made to give it the position it deserves in the surgery of the nose. The writer is conscious of the fact that the attempt to so place it is feeble, but he also believes that ultimately and in abler hands it will be so placed and result in inestimable benefit to mankind.

From what has been said we are in a position to answer the question: Is there an ideal operation for the correction of deviated septa? And it must be in the negative.

The conclusions reached are:

(1) There is no single operation devised which will correct every form of deviation of the nasal septum.

(2) The shape and positions of the septum resulting from deviation are so various as to make accurate description difficult, if not impossible.

(3) The object of operation upon the septum should be correction sufficient to restore the normal functions of the nose with as little destruction of tissue as possible.

(4) Each case must be a law unto itself, and studied carefully and in its entirety.

(5) In many cases the object sought, namely, restoration of nasal function, may be attained by the removal of exostoses or enchondroses and the septum left intact.

(6) Other cases may be corrected by one or other of the older septal operations, the selection of which depends upon the individual preferences of the operator.

(7) Still others can be corrected by removing the septum entire, according to the sub-mucous method.

*Candidate's Thesis.*ERYSIPELAS AND ITS RELATION TO PURULENT
INFLAMMATIONS OF THE NASAL AND
AURAL CAVITIES.

BY CHRISTIAN R. HOLMES, M.D.

Erysipelas is treated of systematically in works on General Medicine, General Surgery and Dermatology. It is an important and serious disease, and merits the attention which these authors give it. Although a germ disease, it still prevails extensively in this latter era of asepsis and antisepsis, invading the best equipped and best managed hospitals and the cleanest and most elegant private houses, and even occurs spontaneously and without apparent cause in absolutely new hospitals.

If you will read the paragraphs that treat of the etiology of this disease in the works that I have referred to, you will see that there is some important thing in its causation that is unexplained or that an assumption is made that is not borne out by the facts as they are available to us to-day. The word "idiopathic," now almost obsolete in every department of medicine, still appears in their pages. They feel the necessity of apologizing for this word, however, and explain that this must be taken to mean that the specific germ, introduced from without, gains entrance to the body through a wound so slight as to have been unnoticed, or so transient as to have been healed and invisible before the onset of the erysipelas. In short, the implication almost invariably contained in their articles is that the infection, the identity of which has now been established for many years, is brought mysteriously to the patient from without—either air borne through the infected atmosphere of a hospital ward, or on the hands or instruments or clothing of the surgeon. In many instances—indeed, in a great majority of instances—this explanation is appealed to

because no other is within the knowledge of the authors; but recent studies have brought me to the conclusion that there is a vast mass of literature bearing upon this very mystery that it is now time to bring together and lay before the general physician and surgeon and the dermatologist, that they may be enabled to penetrate the mystery and advise their students of the most important source of the erysipelatous infection, so that an attempt at prophylaxis will deliver into the hands of the Rhinologist and Aurist a class of cases that we unfortunately too often see only after serious damage is imminent or has already been done. I am referring to the literature of Rhinology, Otology and Ophthalmology. These special branches are not often carefully studied by the writers on the general subjects already referred to, and that they should have missed the significant articles scattered through the magazines of five languages—especially when the American literature contains but scanty reference to the matter—is not to be wondered at.

That we may forge an absolutely complete chain of evidence, I beg that you will allow me to take it up link by link, and therefore we must establish, first, what erysipelas really is.

Erysipelas is an acute infectious, contagious disease, evidencing itself by a characteristic inflammation of the skin and mucous membranes, and occasionally the subcutaneous tissues, with a tendency to spread by continuity of tissue, and with systemic disturbances varying from very mild to very profound. It undoubtedly has a tendency to spontaneous recovery even in severe cases.

The exciting cause of erysipelas is a streptococcus—indeed we may now say the streptococcus. Streptococci are most frequently encountered in their parasitic abode. Though capable of existing for a short time outside of the animal body, their slow growth on culture media and their short lives point to direct transference from body to body. Although these characteristics are not absolutely uniform, I beg you to observe that they militate strongly against the idea that erysipelas is an air-born disease—and on this important point I will submit to you further evidence presently.

Streptococci are subject to many variations in form. They appear as diplococci, in chains of from four to six smaller cocci, and in longer chains with both large and small segments. There is no apparent specific difference between streptococcus longus, streptococcus brevis, streptococcus conglomeratus, streptococcus graevis and streptococcus involutus, since comparatively slight changes in culture media or a sojourn in an animal organism (and this is a very important point in our study of this subject) can change the morphologic characters of the organism. The rate of growth on artificial media differs in streptococci from different sources—but all are of comparatively slow growth. The virulence of streptococci from different sources also differs most markedly—not only in transferring the cocci from animals of one race to those of another, but in transferring from animal to animal of the same race. In other words, environment—the culture medium employed—may increase or decrease the virulence of the germ and its toxins. Streptococci are pus producers. They may be associated with all stages of pyogenic infection from local inflammation to general septicaemia. They are encountered in all mucous and serous membranes, in bones and in such organs as the liver and the brain. Among other infections they are found either alone or combined with other organisms in spreading phlegmon and cellulitis, anginas, lobular pneumonia, sinovitis and osteomyelitis, lymphangitis, pleuritis, peritonitis and puerperal septicaemia. It was formerly thought that the streptococcus of Fehleisen (*Streptococcus Erysipelatis*) was specifically different from those concerned in other inflammations. For instance, John Collins Warren (71), writing on Erysipelas in 1894, said: "Fehleisen concludes from his observations that the Erysipelas coccus is a specific microbe which will always reproduce the disease when inoculated even in the smallest quantities. * * * The question of the identity of the Erysipelas coccus with the streptococcus pyogenes has frequently been raised, and authorities are not yet entirely agreed upon this point. The coccus of Erysipelas is somewhat larger than the streptococcus. * * * Many modern observers concede that the Erysipelas coccus causes not only Erysipelas

but also abscesses, but many others believe that when suppuration occurs, it is due to pyogenic cocci which have become inoculated secondarily, and that suppuration is therefore merely a complication of the disease. Experimental inoculation with Erysipelas cocci has, in the hands of one observer, always produced Erysipelas, while inoculations with the streptococcus produced phlegmonous inflammations."

Since this was written, however, it has been satisfactorily demonstrated that the streptococcus of Erysipelas may become pyogenic and the streptococcus pyogenes may produce a characteristic erysipelatous inflammation of the skin—and we find one of the standard text books of the day on Pathology (58) declaring that "the conditions which they induce depend upon the route by which they gain access to the body, and especially upon their virulence which may be exalted to an extraordinary degree by certain conditions of cultivation and passage through animals. *In short it has been shown that the activity of a streptococcus which only causes abscess may be exalted to a virulence by which erysipelas, purulent infiltration or fatal septicaemia results.*

"These experiments serve to sustain the views as to the common ancestry and close relationship of the various streptococci as indicated by morphologic and physiologic considerations and to emphasize the desirability of considering them as a single group. Besides their more active manifestations streptococci may lie latent."

One of the most important studies that led to the setting forth of this modern dictum was that of Fraenkel (72), who reported to the Hamburg Society of Physicians that from the pus contained in abscesses that had developed in the course of an attack of Erysipelas, he had been able to cultivate an organism that corresponded to the streptococcus erysipelatis. He had also observed a case in which the development of facial erysipelas was ascribed to infection from a felon in the pus of which streptococci were found. In a case of extensive facial erysipelas there was also suppuration of the subcutaneous tissues of the greatly swollen eyelids and of the intermuscular and intramuscular tissues of the neck. In the pus and in the

oedematous fluid streptococci were found microscopically and by culture. In experimental results it appeared that the streptococcus in accordance with the conditions of the infection, at one time occasioned lymphangitis or a phlegmon, at another erysipelas or peritonitis. He had succeeded in inducing erysipelas by injections of streptococcus pyogenes into the ears of rabbits and he had also occasioned suppuration and peritonitis by inoculation of erysipelas cultures. Nor were the results confined to one species of animal.

Prof Wm. H. Welch, of the Johns Hopkins University, in a recent personal communication in answer to my request for an expression of his opinion on the present status of this question says: "*Streptococcus erysipelatis (Fehleisen) cannot be distinguished by any properties morphological, cultural, pathogenic, from Streptococcus pyogenes, and practically all authorities in bacteriology consider the two identical.* Attempts to subdivide into different species or varieties the various streptococci found in human beings in health and in disease have met with little success. There is a wide range of variation of course in all properties, but none seem sufficiently constant to serve as a basis of classification. We must, I think, recognize that a given streptococcus, at least for the time being, is endowed with certain biological qualities, which render it capable of producing effects which another streptococcus may not be able to produce, but such biological differences are either too inconstant or beyond our control or methods of study to enable us to base species-characters upon them."

Having determined the status of the infectious organism let us inquire as to its normal habitat, and the probable circumstances under which it invades and produces disease in the tissues of the body of man.

We know the normal habitat of the typhoid bacillus and the means by which it gains access to the human body; we know the normal habitat of the bacillus of tetanus, and how it gains entrance to its unwilling human host, and we are now in a position to declare that we know the normal habitat of the streptococcus and how under certain circumstances it can virulently attack and produce disease in man.

The nose, the antra of Highmore, the ethmoid cells, the sphenoid cell or cells, the frontal sinus or sinuses, the Eustachian tube, the middle ear, and the mastoid antrum, present a continuous surface of mucous membrane of fairly identical structure in all its parts, moistened physiologically by a more or less abundant mucous secretion and directly continuous by way of the naso-pharynx with the pharynx, the tonsillar region and the mouth.

Lewis & Turner (50), of Edinburgh, published in 1905 a bacteriological study of the nose and its accessory cavities, and I have availed myself freely of their work for the reason that they have reviewed all of the previous literature, and have by their own labors practically brought the subject down to date. Thompson & Hewlett (36), in 1895, had examined ninety-one cover glass smears from nasal mucus and nasal mucous membrane, and had found 80 per cent. of those from the interior of the nose sterile. The vestibule was never sterile.

The work of subsequent observers, however, cast doubt upon these results. Klemperer and Park, and Wright (37) determined that the interior of the healthy nose is not free from germs, and that the nasal secretions have no bactericidal action. They found only six cases sterile out of thirty-six specimens taken.

Hasslauer (38) in an examination of 186 specimens from 111 normal nasal cavities found the staphylococcus pyogenes albus in 25 per cent.; the pneumococcus in 20 per cent, the streptococcus pyogenes in 17 per cent., and the pseudo-diphtheria bacillus in 13 per cent. Viollet (39) also found staphylococci, streptococci and pneumococci in normal nasal secretion. Finally Lewis & Turner endeavored to eliminate the sources of error encountered by their predecessors and undertook and published this most valuable and conclusive series of observations on the healthy and the inflamed nose, mouth and accessory nasal cavities.

They took 26 specimens from 16 healthy noses, and of these only three were found sterile. Thirteen specimens from 7 persons were mono-organismal; 9 from 7 persons showed 2 varieties of bacteria; 1 specimen showed 3 varieties. The

pneumococcus was found in 4 cases, staphylococci in 13, streptococci in 6, Hoffman's bacillus in 2, bacillus aureus in 2, bacillus mesentericus in 2, spirillum in 2, bacillus of Friedlander, the proteus vulgaris, and an unknown bacillus in 1 each. Organisms from 9 healthy noses were non-pathogenic on inoculation in animals. From two healthy noses pathogenic organisms were obtained. From one of these the staphylococcus aureus and albus produced local abscess in, but were not fatal to, guinea pigs. In the other case streptococcus pyogenes was present, the broth culture proving fatal to a rabbit in 14 days after intraperitoneal injection of 2 cc. Slow growth on culture media makes it appear "that the interior of the normal nose may appear sterile owing to the fact that organisms though present occur in such few numbers as to escape recognition by rapid methods. Further, it appears that the staphylococci found in the healthy nose are often of low vitality and do not grow so rapidly in ordinary media as the same varieties derived from pus. * * * It happened more than once that broth in which a swab had been immersed and incubated for 48 hours showed no cloudiness or other sign of growth in the first 24 hours; on the second day, however, the broth either became cloudy throughout or remained clear but with distinct sedimentary growth. * * * The inference is that the nose contained numerically few organisms or that the organisms present in the nose were of diminished vigor and were revived after a period in a suitable medium, such as broth."

It appears that the organisms of the healthy nose belong to the same varieties as those found in abnormal conditions, but that they differ from the flora of pathological nasal membranes in actual numbers, in purity of culture, in vigor of growth and in pathogenicity.

*"In inflammatory conditions of the nasal cavities the organisms present belong to very much the same varieties as those which may be found in the healthy cavities. * * * All the varieties present may not be pathogenic on injection into animals, but usually one variety is virulent in the early stages of the disease. * * * the pathogenicity is high at first and diminishes rapidly, so that an organism isolated in the first few days of a nasal catarrh, and then very fatal to guinea pigs, becomes*

*later incapable of producing any pathogenic effect. * * * To produce nasal inflammation not only is the presence of pathogenic varieties necessary, but these varieties must be virulent, or if virulent, must recover their virulence by the influence of other factors."*

Thirteen specimens were examined from 8 acute cases and one chronic case of purulent nasal catarrh. The streptococcus pyogenes was present in 6 of the acute and in the chronic case—various staphylococci were present in 6 cases, and the pneumococcus in one case. Of the 8 acute cases, pure cultures of staphylococci were obtained in 2, and in the remaining 6 the streptococcus was the probable exciting cause. In the chronic case both were found, but the streptococcus was probably the etiological factor. From three of the cases virulent pathogenic organisms were obtained—twice the streptococcus and once the staphylococcus pyogenes citreus. *The streptococci in these cases were so virulent as to prove fatal to guinea pigs in 24 hours. Ten days later the streptococcus isolated afresh from the discharge in one of these cases proved nonpathogenic.*

The pathogenic bacteria of the mouth include many varieties which are found in suppuration of the antrum and other sinuses. The streptococcus pyogenes, the staphylococci, the pneumococcus, the B. diphtheriae, and the B. pyocyaneus are all found at times in the mouth. In addition to the organisms specially associated with carious teeth—streptococcus brevis, B. necrodentalis and staphylococcus albus—any of the denizens of the mouth may of course be found on the outer surfaces, if not in the deeper layers of the carious matter.

Törne (44) has published observations on the bacteria of the healthy accessory sinuses. He examined 36 cadavera in which the maxillary and frontal sinuses were healthy; 22 were examined within 2½ hours after death, and in all these the sinuses were found sterile. Of the remaining 14 examined, from 3 to 25 hours post mortem, 7 were sterile and 7 contained bacteria. This suggests that the entrance of organisms occurs some hours after death. The maxillary and frontal sinuses were sterile in 29 of the 36 cadavera examined within 25 hours post mortem. Törne also examined 26 pathological cavities in 16

cadavera; 11 cavities, examined 3 hours post mortem, showed catarrhal changes, but 9 of these were sterile; 12 cavities showed chronic purulent inflammation. There were present streptococci, micrococcus pyogenes aureus, pseudo-catarrhalis tardiliquans, etc. Three cavities in acute cases, examined $1\frac{1}{4}$ hours after death, all showed bacillus pneumoniae.

Pearce (45) found inflammatory changes in the maxillary antrum of many cases of diphtheria, with Klebs Loeffler bacilli present in nearly all. In four cases of diphtheria complicated with scarlet fever pus was found in the antra in three, and the organisms present were streptococci and staphylococci. In 102 post mortem examinations in which the accessory sinuses were examined, Kirkland and Stacey (46) found 34 cases of infection by micro-organisms in which streptococci, staphylococci and pneumococci were found.

Herzfeld and Hermann (47), in ten cases of antral suppuration found the streptococcus in eight cases and staphylococcus in seven.

Howard and Ingersoll (48), in an examination as to the causes of inflammations of the accessory sinuses, concluded that these inflammations are due to the bacteria which are commonly present in the buccal and nasal cavities—in the former in health and in the latter occasionally in health and usually in disease. These organisms are the diplococcus lanceolatus, streptococcus, staphylococcus pyogenes, B. mucosus capsulatus, B. diphtheriae and B. influenzae.

Stanculeanu and Baup (49) determined that clinically and bacteriologically there are two varieties of empyaema of the facial sinuses, one with foetid pus following on dental affections, and the other of nasal origin with nonfoetid pus—the latter being due to such organisms as the streptococcus and the pneumococcus. The greater frequency of anaerobic organisms in the mouth lends some support to these views.

As to pathogenicity, they state that in cases of nasal origin the aerobes and in cases of dental origin the anaerobes are always found virulent on injection into animals.

Finally Lewis and Turner themselves reported on their extensive series of observations. They examined 80 specimens of

pus from 57 antral cavities. They found streptococci in 43, or 75.4 per cent.; pneumococci in 42, or 74.1 per cent., and staphylococci in 40, or 70.1 per cent. Swabs were taken from the nasal chambers of 42 of these cases. Pneumococci were found in 29, or 70 per cent.; staphylococci in 28, or 66.6 per cent., and streptococci in 27, or 64.3 per cent. Swabs were taken directly from the antral cavities in 27 of the cases. Pneumococci were found in 21, or 77 per cent.; staphylococci in 21, or 77 per cent., and streptococci in 21, or 77 per cent. Of the 57 cavities, there were only four in which the swab yielded an absolutely pure culture. In two the streptococcus was present, in one the staphylococcus, and in one the pneumococcus.

Thirteen acute cases showed staphylococci in 11, or 84.6 per cent.; pneumococci in 11, or 84.6 per cent., and streptococci in 8, or 61.6 per cent. Forty-four chronic cases showed streptococci in 35, or 80 per cent.; pneumococci in 31, or 70 per cent., and staphylococci in 29, or 66 per cent. The B. influenzae, which was only obtained in one instance, occurred in a recent case of only three weeks duration.

The authors state: "Though, in the wealth of organisms associated in these cases, and possibly pathogenic, it could not be certainly stated which was the *fons et origo mali*, yet in some of the cases we were enabled to conjecture which organism was most probably responsible. This we did on consideration (1) of the pathogenicity of the organism (as ascertained by experiments on animals) and (2) of the organisms in direct swab as compared with nasal swab from the same case, and (3) of the persistence in chronic cases of particular varieties, and (4) of the occurrence in pure culture of one organism. In this way we are able, though with some difficulty, to assign the principal role to the pneumococcus in fourteen, to the streptococcus pyogenes in nineteen, and to the staphylococcus in six of the fifty-seven cavities."

Among recent cases the pneumococcus was probably responsible for the inflammation in four; the staphylococcus in three, and the streptococcus in two—four cases being undeterminable. Among the long-standing cases the pneumococcus was probably responsible in ten; the staphylococcus in three, and the streptococcus in seventeen—fourteen being undeterminable.

In 12 cases the antral disease was complicated by inflammation of the ethmoid in 4 cases, by disease of the frontal sinuses in 6 cases, and by disease of both ethmoid and frontal in 2 cases. Ten cavities showed staphylococci, seven showed streptococci, and seven pneumococci. Pus from a chronic inflammation of the ethmoid sinus alone showed both streptococci and staphylococci. Pus from the frontal sinus alone showed in one case pneumococcus and staphylococcus, and in another case streptococcus and staphylococcus, and in a third case all three organisms.

In order to ascertain whether the combinations of organisms present might be pathogenic even though the individual organisms in pure culture were not so, several injections of impure culture were made. The results yielded no evidence that organisms which in pure culture were non-pathogenic would in combination give rise to disease. The reverse was, however, not the case, for in three instances a pneumococcus which in pure culture was pathogenic produced no illness when injected along with the other organisms present in the same case. Pneumococci, tested in 10 acute cases were pathogenic to rabbits in 5, or 50 per cent. Staphylococci tested in 10 acute cases were pathogenic to guinea pigs in 5, or 50 per cent., and streptococci tested in 8 acute cases were pathogenic in 6, or 75 per cent.

Pneumococci tested in 17 chronic cases were pathogenic to rabbits in 5, or 29 per cent. Staphylococci tested in 28 chronic cases were pathogenic in 9, or 32 per cent. In four cases in which the condition had lasted more than eight years streptococci were found pathogenic to animals, but not fatal.

"In recent cases the organisms are pathogenic twice as often as in chronic cases." "In both recent and chronic cases the streptococci are more pathogenic to animals than all other varieties." "The streptococci are almost always pathogenic when recovered from recent cases, but in chronic cases seem to have largely lost their virulent character. There is no guarantee, however, that these organisms would remain so little virulent if by chance implanted on more suitable soil."

Iglaue (73), of Cincinnati, working in the Pathological Institute of Vienna, and taking nasal mucus directly from the

posterior nares by means of a head section, as soon post mortem as practicable, found, in 20 selected cases, the staphylococcus pyogenes aureus in 11 cases; the staphylococcus pyogenes albus in 6 cases; the diplococcus pneumoniae in 8 cases, and the streptococcus pyogenes in 6 cases. In 14 additional cases in which there was a marked pulmonic lesion he found the staphylococcus pyogenes aureus in 7 cases; the staphylococcus pyogenes albus in 8 cases; the diplococcus pneumoniae in 8 cases, and the streptococcus in 6 cases. Finally, as a negative contribution to the etiology of disease of the maxillary antrum, the only one of the accessory cavities suspected of having any other than a nasal source for the inflammations that attack it, I would quote Fletcher (70), who examined the 200 antra of 100 skulls for (1) abscessed teeth, (2) septa, (3) for conical protrusions of the roots of the teeth into the antrum, (4) for perforation by the roots of the teeth without protrusion, and (5) for perforation of the antrum from ulcerated teeth. He says: "As to the molars, ulceration was found in more than 25 per cent. of the skulls, there being in these 200 examinations 57 ulcerated teeth, and out of these 57 possible cases of perforation by inflammation and its results, we found such to be the case only four times, all other cases having perforated the alveolar border and discharged the pus into the mouth, two of them discharging both in the mouth and in the antrum." Lewis and Turner cite a number of observers to the same effect.

It is quite possible for bacteria to enter the middle ear, and they probably do so, through the Eustachian tube, remaining dormant under normal conditions and eventually losing their vitality. In scarlet fever and other severe anginas the micro-organisms effect an indirect invasion by way of the lymphatics—and in other diseases, such as endocarditis and diphtheria, by way of the blood vessels. Politzer (74) says that entrance may be effected from the external auditory canal through either the perforated or intact membrana tympani. Zaufal and Nadoleczny, quoted by Politzer, state that the streptococcus pyogenes and diplococcus pneumoniae are the exciting causes of acute otitis media. If the middle ear secretion is examined immediately after a paracentesis diplococci

and streptococci occur just as often alone as in combination with other pathogenic micro-organisms. Except in the case of such specific diseases as diphtheria, typhoid, influenza and epidemic cerebro-spinal meningitis where the specific micro-organisms of these diseases are found, the finding of micro-organisms in the discharge other than the pneumococcus or the streptococcus indicated a secondary infection.

Lermoyez and Helme came to the conclusion after numerous investigations that otitis media acuta is always of mono-bacillic origin, and that the pneumococcus or streptococcus is seldom found in combination with other organisms.

Secondary infection by the staphylococcus takes place only in the later course of the disease, per tubam or through the external auditory canal. Before quitting the subject of the bacteriology of the nose, the sinuses and the ear, I wish to call your attention to two significant observations. One was made by Dench and Cunningham (75) and reported to the American Otological Society in 1902, in a paper on "The Value of Bacteriological Examination of the Discharge in Acute Otitis Media as Determining the Necessity of Operative Interference." They say "the presence of the pneumococcus as the sole etiological factor signifies a rather mild form of inflammation in the mastoid cells. * * * On the other hand it has been most interesting to note the rapidity with which the streptococcus infection develops. * * * the osseous structures have been found at the time of operation to be extensively involved, even in those cases which have been operated upon in the very earliest stages of the disease. In many cases in which the inflammatory process had existed but from 48 to 72 hours, extensive destruction of the bone had taken place." In four recent cases of streptococcus infection which had apparently cleared up the patients returned complaining of a recurrence of the local pain with slight discharge from the ear and an appearance of general sepsis, and in these cases upon operation a most extensive destruction of the bony tissue was found. In three cases epidural abscess had been present, and in a fourth case thrombosis of the lateral sinus existed at the time of operation."

The following tables which require no explanation are given:

<i>Nature of Infection.</i>	<i>No. Cases. Ice Coil. Operation. No Operation.</i>			
Streptococcus (pure) ...	33	17	28	5
Staphylococcus.....	3	3	2	1
Pneumococcus	21	21	2	19
Mixed infection with Streptococcus present	25	19	23	2
Mixed infection with no Streptococcus present.	9	9	3	6
	<i>Recovery.</i>			
	<i>Ice Coil.</i>		<i>Operation.</i>	
Streptococcus	14	per cent.	86	per cent.
Staphylococcus	33	1-3 per cent.	66	2-3 per cent.
Pneumococcus	90	per cent.	10	per cent.
Mixed with Streptococcus..	8	per cent.	92	per cent.
Mixed, no Streptococcus..	66	2-3 per cent.	33	1-3 per cent.

The other significant observation is from the pathological laboratory of the Ancon Hospital, Isthmus of Panama. Darling (56) writes: "This communication contains some of the results of an investigation which is being conducted to determine the relation of inflammations of the 'accessory nasal sinuses to pneumococcus infections. * * * the accessory sinuses have been examined with regard to this point in 52 autopsies, 37 of which were pneumococcus infections as follows: lobar pneumonia 22, acute pericarditis 1, acute meningitis 9, pneumococcus septicaemia 5. The remaining 15 cases were controls.

"It has been found that 92 per cent. of all pneumococcus infections coming to autopsy show in a very marked degree more or less typical pneumococcus inflammation of one or more of the accessory nasal sinuses. The inflammation is generally intense. It is fibropurulent in character—fibrin and mononuclear cells being abundant. Pneumococci are always present and in numbers depending on the duration of the process. A point of great importance is the age of the sinus affection which has been appreciably greater than that of the lung or meningeal lesion—91 per cent of the lobar pneumonia cases showed a sinusitis. All cases of acute pneumococcus meningitis presented an inflammation of one or more of the sinuses, and in every one the middle ears and mastoid cells were normal. In the pneumo-

coccus septicaemia group 80 per cent. were found to be associated with a sinusitis."

Is it not possible for us now to assign their proper pathogenic role to the two principal pathogenic bacteria which have their normal habitat in the nose and its accessory sinuses—the pneumococcus producing such diseases as lobar pneumonia, acute purulent cerebro-spinal meningitis (pneumococcus), endocarditis, pericarditis and mild infections of the middle ear—while the streptococcus produces—starting as it does from the same base—violent inflammations of the ear—purulent meningitis, cerebral abscess, metastatic abscesses of various kinds, and, as I shall now proceed to show, erysipelas?

As is almost invariably the case with any material advance in our knowledge of the physical and biological sciences, so with this question in pathology, it happens that a number of observers in different countries have almost simultaneously made approximately the same suggestions—but either because their theories were advanced through some medium that had but a limited circulation in a language not generally read, or because their papers did not fall under the notice of systematic students of and writers upon pathology, or because the amount of evidence they could produce at the time was not sufficiently convincing, it happens that up to the present their work has attracted but little if any attention.

H. M. Fish (76) quotes Riberi as having in 1845 traced two cases of orbital abscesses to a sinusitis, and as having said: "Intraorbital abscesses, observed at times after facial erysipelas, are not the result of the erysipelas, but, on the contrary, they are the cause or place of departure"—and quotes Zucarini as saying, in 1853: "The increased secretion of mucus within the sinuses, when drainage is insufficient, soon changes to a mucopurulent form; its resorption induces erysipelas, and the appearance, increase and subsidence of the erysipelas depend entirely upon a successful drainage of the cavities."

In 1891 Luc (14) reported the following significant case: "Following upon an erysipelas of the face which had already manifested its suppurative tendency by occasioning, in the course of its evolution, an abscess of the lid, the symptoms of an

empyema of the left antrum of Highmore appeared. Only after 9 months was this empyema recognized and operated upon, and an examination of the pus revealed the exclusive presence of the chains of streptococci characteristic of erysipelas. * * * Some days after the double operation" (removal of polypous masses from the middle meatus and opening the antrum from the mouth) "and without having been, at least apparently, submitted to any contagious influence, but after several excursions through intense cold, the patient was attacked by a facial erysipelas which began at the left nostril."

Previous to seeing this case Luc believed that all empyemata of the antrum of Highmore were of dental origin. His earlier cases, he believed, could all be traced to dental caries; the pus from the cavities contained many varieties of organisms and it was invariably foetid. In this erysipelatous case, however, Dr. Ledoux Lebard found streptococci in pure culture in the antrum (the teeth of the patient were sound), while in another antral case operated upon at the same time by Luc, the origin of which was undoubtedly dental and in which the pus was malodorous, Lebard found staphylococci, diplococci, long filaments of short, round, oval, or rod-like segments, and isolated bacilli and micrococci. In 1896 a Swedish author, C. Janson (51), in a remarkable article on "Causes of Infection in Facial Erysipelas" (*Forhandlingar vid Forsta Nordiska Kongressen*, August, 1896), first formulated the correct theory of the etiology of the disease without, however, adducing any cases in proof of his contention, which may be the reason why the paper has attracted so little attention. I translate a few paragraphs as follows:

"It must strike one as remarkable that facial erysipelas is so much more frequent than all other forms of erysipelas. The constant exposure of the face cannot be the only reason, because the hands are equally exposed and much more frequently come in direct contact with substances that might cause infection—yet erysipelas of the hands is relatively a rare occurrence. Facial erysipelas generally begins at the nose, and fissures at the entrance of the nares have long been regarded as the points of entrance of the infection. Two symptoms are found in this disease that are frequently overlooked although they very often

usher in the erysipelas, viz.: nasal catarrh and inflammations of the pharynx. When we consider this it is rational to assume that the cause of the infection in erysipelas has its origin in the nose and pharynx. It has been demonstrated that streptococci can always be found in the pharynx of a healthy person, and they could—even if under ordinary conditions they are non-virulent—assume an activity that would develop erysipelas or a fatal septicaemia. * * * The author believes that in general the streptococci, which are harmless saprophytes in the pharynx, under certain as yet not well understood conditions can cause facial erysipelas with or without angina or coryza as a primary cause, and that the infection usually develops in this manner. Streptococci then come to belong to the same group as the pneumococci and colon bacilli, viz.: saprophytes with facultative virulence.”

Six months later Mermet (11), in discussing palpebral erysipelas, brought forward considerations of almost equal theoretical significance. He pointed out “that the streptococcus is not an habitual inhabitant of the skin, that we have never been able to find it on the normal lids and that Achalme has not been able to obtain cultures exposed freely to the air even in wards affected with erysipelas—note finally that the absence of predisposition of this affection for the lids of the right side seems to preclude the idea of a contamination by the hands of the patient. * * * Very frequently the streptococcus infection of the lids is secondary either to an external erysipelas or to an affection of the lachrymal sac and canal, of the conjunctive or of the cavities of the face. * * * We should point out here a fact of the greatest importance; it is the predilection that the streptococcus has to travel by way of the lymphatics and the subcutaneous tissue, evincing a preference for the ascending channels of the mucous membranes. This observation accounts to us for the predominance of streptococcic lid lesions considering the conjunctival determinations in the cases of palpebral erysipelas consecutive to infections of sac or the upper lachrymal canal.”

In discussing recurrent erysipelas Mermet observes “one can very easily conceive that the streptococci which normally inhabit the mouth, the nasal fossae and the lachrymal ducts in the quality of inoffensive guests recover their virulence under some

influences analogous to those which experimentation has realized and invade the lids."

H. Roger (69), also, after a personal study of 957 cases, says: "Classic authors consider an erysipelatous angina as very frequent; our observations on this point do not accord with this opinion. Very often, it is true, the patients complain of having suffered with sore throat, but the objective examination was entirely negative, and a close inquiry indicated to us that it was a matter in reality of painful swelling of the crevical glands. Adenitis frequently accompanies erysipelas. In 21 cases, it has preceded by at least one day the cutaneous eruption. The nasal fossae, we believe, ought to be suspected more often than the pharynx; in many cases the patients were suffering with coryza for a greater or less time and the infection seems to have invaded the skin by way of an ulceration of the mucous membrane at the nasal vestibule."

He refers also to the fact that streptococci spread anteriorly upon the skin may penetrate the cutaneous glands and there develop into inflammatory activity upon the occasion of an intercurrent cause such as a chill.

A. Logan Turner also adds a definite expression of opinion in his recent work on "The Accessory Sinuses of the Nose." He says: "Suppuration has been ascribed by Weichselbaum to an attack of facial erysipelas; it is more reasonable when these conditions are associated to regard the erysipelas as secondary to the nasal discharge."

The French authors and teachers seem to have appreciated the causal conditions of facial erysipelas for a number of years past. Thus we find in a thesis for the doctorate at Bordeaux by Fauveau (59) the following most excellent description: "In medical erysipelas (spontaneous, idiopathic) the port of entry of the contagion frequently passes unperceived when the site of the disease is the face, because it is hidden in the natural cavities such as the mouth, the pharynx, the external auditory canal or the nasal fossae. * * *

It is frequently by way of the nasal mucous membrane that the facial erysipelas that is called spontaneous or recurrent erysipelas arises. The pharynx is also one of the seats of predi-

lection of erysipelas of the mucous membranes. From there it extends itself easily, thanks to the laxity of the tissues of this region and their abundant blood supply, to the whole vault of the pharynx with all its anfractuosités, to the veil of the palate, to the buccal mucosa and to the nasal fossae. This spread of the streptococcic infection is important from the view point of the explanation of the ocular complications which it is able to provoke. Almost always, indeed, it is observed that an erysipelas occurring or beginning in the nasal fossa shows itself without by emerging either through the anterior orifice of the nose, or, and this is the condition which interests us particularly, by the orifice of the lachrymal canal at the internal angle of the eye. In the article on erysipelas in the *Dictionary of Jaccond*, Maurice Reynaud expresses himself thus: "I am brought to believe that the greatest number of cases of erysipelas of which the first manifestation appears as a red patch at the root of the nose have in reality emerged from one of the lachrymal points and have taken their origin in the corresponding nasal fossa. It is indeed this manifestation on the part of the lachrymal channels that indicates the nature of the rhinitis of which one has only observed the external manifestation. It is in fact often difficult to establish the diagnosis between erysipelas limited to the nasal mucosa and certain intense coryzas—especially those whose general symptoms present in a majority of cases an unwonted severity and in which the temperature is quite elevated."

Following upon this theoretical discussion and the quotation of the views of men of wide experience and keen observation allow me to cite concrete instances in which facial erysipelas took its origin in or from the nose, the accessory nasal cavities or the ear.

Mercier-Bellevue (81), in commenting on a case of facial erysipelas occurring in the course of and during the sinusitis of the maxillary antrum and frontal sinus, says: "The interesting point in this observation appears to me to reside in the etiology or, better, the pathogeny of this case of facial erysipelas occurring abruptly in a man appearing to enjoy excellent health. As I said in my opening remarks, the complications of sinusitis are

as numerous as they are frequent, so, on the one hand, one finds on the part of the sinus the explanation of those gastrointestinal or pulmonary affections which are so rebellious to all our remedial measures, and on the other hand, in a chronic or acute suppuration of a cavity of the face one can find the explanation of those cases of recurrent erysipelas which one combats so vigorously, but which one cures so rarely because one does not know the real cause of them."

In the course of the discussion M. Bessonnet said that he had seen erysipelas follow simple acute coryzas.

H. Roger (69) made personal observation of 957 cases of erysipelas. He divides them, after the classic authors, into traumatic and nontraumatic—i. e., into those in which an antecedent wound was visible, and those in which no wound or abrasion was visible. Their distribution was as follows:

	No. of Cases.	Nontraumatic.		Traumatic.		Total.	
		M.	F.	M.	F.	M.	F.
Face	469	183	219	35	32	218	251
Face and Neck..	96	24	53	15	4	39	57
Lower Limbs ...	19	3	4	6	6	9	10
Upper Limbs ...	9	2	1	4	2	6	3
Trunk	4	2	1	2	2	2	2
	597	214	278	62	46	274	323

Nontraumatic 492. Traumatic 108.

In 488 cases of facial erysipelas the distribution was as follows:

Check 112.	Scalp 24.
Internal angle of eye 95.	Forehead 17.
Base of the nose 83.	Upper Lid 12.
Lids 50.	Temple 9.
Wings of Nose 41.	Top of Nose 4.
Ears 36.	Neck 2.
Chin 3.	

Spohn (77) collected by circular letter the details of 1,000 cases of erysipelas; 900 were facial. Of the facial the beginning point of the disease was: scalp 3, cheek 3, lids 7, ears 60, lips 90, nose 737; 82 per cent began at the nose. Spohn concludes: "A careful examination will reveal that all or nearly all cases of facial erysipelas, unless traumatic, had a previous

chronic catarrh, and a partial or total stenosis of one of the nostrils."—*Detroit Medical Journal*, vol. 4, 1904-1905, p. 361.

Welty (78), of San Francisco, made a personal examination of some 60 cases of facial erysipelas which he reported to the American Medical Association. Unfortunately his records were destroyed by the earthquake and fire of 1906. He reports from memory that eight patients had more than one attack, and pus (in the nose) was always demonstrated in their cases. The point of inoculation in a large majority of cases was about the nose. More than 90 per cent. complained of nasal affections accompanied with a discharge. In 60 per cent. of the whole number of cases he demonstrated pus in the ear or nose. The bacteriologic examination of 30 cases of erysipelas demonstrated streptococci alone. Examination of secretions from ear and nose showed mixed infections—streptococci always present.

In the discussion that followed Farlow, of Boston, reported the following cases: Man of 40—recurrent erysipelas; after treatment of an erosion of the septum no further attacks of erysipelas. Patient aged 50—recurrent erysipelas; treatment of an erosion of the septum prevented further attacks. Woman aged 40—recurrent erysipelas; treatment of septal erosion prevented further attacks. Woman aged 84—facial erysipelas; T. 103, and a tendency to coma; Farlow washed out the nose, treated a septal erosion, and the next day the temperature was nearly normal.

Dr. Mosher, of Boston, said that a routine examination of the nose in cases of erysipelas had been the custom at the Massachusetts General Hospital for years. The dermatologists always send their erysipelas patients to the Eye and Ear Infirmary for examination of the nose.—*Journal American Medical Association*, Dec. 22, 1906.

Stein (79) reports a case of chronic nasal catarrh with acute exacerbation. Neuralgic pain right side of head; occlusion right nostril; T. 105 F.; rhinitis, sinusitis, streptococci present "in profusion." On the third day "a small area of redness made its appearance over the bridge of the nose," etc. Erysipelas. Examination of vesicles and pustules showed streptococci.—*Chicago Medical Recorder*, vol. 17, p. 308, 1899.

In case of erysipelas with prodromal fever, as occurred 28 times in 69 cases, there is frequently an antecedent affection of the throat. The erysipelas spreads to the skin of the face through the nasal passages, the lachrymal canal or through the Eustachian tube and the external auditory canal. "Physiological wounds," clefts, are present in the mucous membrane covering the lymphoid tissue.—Gerhardt, Berlin. *Klinische Wochenschrift*, No. 3, s. 45—1887.

Clinical observations on a mild case of erysipelas which developed from a chronic scrofulous rhinitis. Arnold Cantini, *Bollet. delle Cliniche*, No. 2, 1887.

Three cases of chronic antral disease which had annually passed through one or two attacks of facial erysipelas for the preceding five years. After operative procedures upon the antral contents erysipelas did not recur.—Hajek, *Pathol u. Therap. der entzünd Erkrank. der Nebenhöhlen der Nase*, 1899, p. 77.

Cases of erysipelas of the pharyngeal musoca are rare, but they are of great moment as a secondary facial erysipelas may follow on a primary erysipelas of the mucosa of the nose, throat and mouth. A case of this kind occurred in Schwartz's ear clinic. A patient who had had a tonsil removed visited another patient with erysipelas and thus acquired an erysipelas of the naso-pharynx which spread through the Eustachian tube into the middle ear, the external canal, the auricle and the face.

Rendu saw a man with specific glossitis in whom he identified erysipelas by bacteriological examination. The erysipelas spread to the face. *France Medicale*, 1892.

Erysipelas of the mucous membrane of the nose either begins in the pharynx, extends through the nose and then spreads over the face, or it progresses in the opposite direction. *Die Krankheiten des Nase, Ihre Nebenhöhlen und des Nasenrachenraumes*; Zarniko, Chap. 8, Rhinitis purulenta acuta, p. 166, p. 472.

Clergyman, aged 48; boil in the nose; opened after seven days; T. 103 F.; P. 110; "Swelling and redness of the nose was marked and decidedly erysipelatous in character." Disease pursued a typical course except that there was some involve-

ment of the posterior nares and the pharynx and later more or less hemorrhage from the bowels for a week. J. M. Harwood, Shelbyville, Ky., *American Pract. and News*, April 30, 1887.

Case I.—Child, aged 4; acute nasal catarrh and facial erysipelas commencing on the bridge of the nose. Warm alkaline nasal injections without any other treatment markedly improved the nasal condition and the erysipelas.

Case II.—Boy, aged 12; hypertrophic nasal catarrh. Recurrent attacks of erysipelas of nose and cheeks. Treatment of the nose caused the permanent disappearance of the erysipelas.

The reporter also says he has notes of two similar cases of his own, and four of his colleagues. "In the cases referred to above the erysipelas always commenced on the bridge of the nose, and was greatest on the side of the greatest pressure. There was no condition present in the nasal chambers that I could recognize as of an erysipelatous nature in any of them." Geo. W. Major, Montreal, Can., *New York Medical Journal*, Aug. 10, 1889.

A mechanic, 25 years of age, developed erysipelas on the left side of his face after a "cold." (See also list of ocular complications after erysipelas). Leber, *Archiv. f. Ophth.*, Vol. XXVI., Part 3, p. 224.

With symptoms of a pharyngitis and inflammation of the upper air passages, pains in the chest and difficulty in swallowing, a woman of 30 years entered the hospital; here fever and delirium were added. In 9 days a facial erysipelas began at the nose. In a few days it disappeared without recurrence. (See also list of ocular complications after erysipelas). Duroziez. —*Archiv. Gen. de Med.*, 5, sec. XXV, 1860, s. 698.

Case I.—Man, aged 29; pharyngitis and slight earache; post-pharyngeal abscess. Incised liberally; three or four grams pus. Pharyngeal tonsil removed. Two weeks later, acute otitis media. Paracentesis M. T. releasing bloody pus. Walls of pharynx greatly tumified and of a dusky red. The left nasal cavity swelled shut, T. 103-105 F., and erysipelas now spread from nostril over entire face. Severe case, one relapse, recovery.

Case II.—Woman, aged 25; facial erysipelas which had arisen at the right nostril, spread over the face and disappeared

The nasal passages were swollen and the pharynx reddened. There had been sore throat for some months; ear trouble had appeared one week previously, the M. T. bursting spontaneously. Mastoid tender, T. 103, P. rapid and feeble. A few days later erysipelas appeared again at the tip of the nose and spread over the face.—H. V. Wurdemann, *Medical News*, Nov. 21, 1891.

Gasser reports: Erysipelas about the left orbit; on the fourth day a flow of mucous from nostril, pain in temporal region; death on sixth day. Ethmoiditis found at autopsy. Quoted by Fish, *American Journal Surgery*, Sept. 1906.

Vacher, of Orleans, reported to the Société Belge d'Otologie a case of facial erysipelas in a woman which followed a paracentesis M. T., evacuating blood and pus in the course of a violent otitis and mastoiditis. She had suffered for a number of years from a chronic dacryocystitis in which the sac was daily emptied by pressure, the muco-purulent contents being expressed into the nose.

A woman of 38 developed facial erysipelas which possibly originated in an excoriation at the right ala of the nose, and followed a rapid cooling of the body. The lids swelled and both eyes protruded. (See also list of ocular complications after erysipelas.) Jager, *Ophthalmoskop Handatlas*, Fig. 75, Plate XVI., 1869.

Man, aged 35; complained of exophthalmos and a discharge from the nose of one year's duration; eye displaced, down and out; upper lid thickened and drooped, covering a soft swelling in upper part of orbit. Pressure on swelling caused thick pus to appear in left nasal passage. Ocular mobility restricted; vision normal; venous congestion of retina. Left middle turbinate hypertrophied. Middle meatus contained polypi and offensive pus. Probe detected extensive necrosis ethmoid cells; patient was in excellent health. Futile attempts were made to treat the case by intranasal operation, but disease was too extensive. Operation was done under ether. In completing external incision at inner orbital margin an abscess cavity was opened. Floor and inner wall of frontal sinus were extensively diseased, as also the ethmoid labyrinth. The sphenoidal sinus was healthy. Seventeen days after operation erysipelas appeared lasting nine days. Recovery. Arnold H. Knapp. *Archives of Ophthalmology*, Vol. XXVIII., p. 50.

Case I.—Contagion arising from abrasion in the anterior nares in a patient who was in the habit of picking the nose,

and who had visited and nursed an erysipelatous patient in the neighborhood. Acute suppuration in the left middle ear occurring after extension of the erysipelas to the nose and throat. Recovery after one relapse. Microscopic examination of ear discharge revealed several forms of pus cocci including streptococci.

Case II.—Beginning in an abrasion of the m. m. of the lower lip in a pipe smoker; extending through the buccal cavity to the naso-pharynx, through the Eustachian tubes to the middle ear, causing suppuration; extension to face and scalp. No history of contagion. Recovery.

Case III.—A scrofulous child with erosion of anterior nares and upper lip from purulent rhinitis. Facial erysipelas. Recovery.

Case IV.—An old man whose nasal passages had been occluded for years by an enormous number of polypi, the operations for which were made daily for about a week. Considerable malodorous purulent discharge followed. After attempted disinfection the galvano-cautery was used, and two days later erysipelas appeared in the nares extending over the face. Recovery. H. V. Wurdemann, *Medical News*, Nov. 10, 1894.

A working woman 56 years of age, poorly nourished, who suffered with a chronic rhinitis, developed erysipelas with especial involvement of the lids (see also list of ocular complications after erysipelas) Mitvalsky. *Klin. Monatsbl. f. Aogenheilk* 1893, s. 18, Aschenborn, *Archiv. f. Klin. Chirurg* XXV, s. 154.

A primipara, aged 33, complained of pain and sensation of tension in the nose on the day of delivery. She had suffered from naso-pharyngeal catarrh in the last days of her pregnancy. Two days after delivery the nose and the lids of both eyes were so swollen that the eyes could not be opened. Violent erysipelas developed. (See also list of ocular complications of erysipelas), Joss. *Correspondenzbl. f. Aerzte Bd. XXXI.*, 1901, s. 617.

Laborer, 37 years old. Considerable swelling of the tongue, which began at the anterior half at a point of ulceration, the result of a carious tooth. The swelling was so great that the patient could not close the mouth. There was debility, headache and fever. Violent erysipelas. In the course of a few days the pharynx and in succession the cheeks, the nares, the eyelids, the ears and the scalp became involved. Garen, *Annales des Mal. de l'Oreille*, May, 1891.

“Cauterization of the nasal mucous membrane is not entirely free from risk. Cases have been met with in which erysipelas of the nose and face, otitis media, ocular troubles, such as amblyopia and venous engorgement of the eye with papillary

hyperaemia have occurred. * * * In cases of recurrent erysipelas of the face the pharyngeal tonsil has apparently been the starting point of the erysipelas, and it is well known that the nose, especially when affected with chronic rhinitis, frequently gives rise to facial erysipelas. These facts should emphasize the importance of the careful examination of the nose and naso-pharynx in cases of recurrent erysipelas of the face, and they would also suggest a possible mode of origin of pharyngeal and laryngeal erysipelas, because if the disease can spread externally there is no reason why it should not spread internally." *Diseases of the Nose and Throat*, Hall and Tilly, Second Edition, 1901.

Facial erysipelas occurring in a case of melancholia. "The patient had a well defined facial erysipelas beginning in the right side of the face just in front of the ear and in the external canal of the left ear from which came a sero-purulent discharge." *Jour. Am. Medical Ass'n.*, 1904, XLII., p. 647.

Woman, aged 70. Erysipelas of the face, having begun at the nasal orifice on the right side, involving the right half of the nose and the cheek. Throat red, tongue dry. (See also list of ocular complications after erysipelas). F. Terrien, *Neurite et atrophie optique au cours de l'erysipéle*. *Progres Méd. Paris*, 1904, XX., p. 165.

In addition to the case mentioned in the discussion of Dr. Welty's paper at the meeting of the American Medical Association, Dr. John W. Farlow, of Boston, reports the following cases: Case 1.—Woman aged 40 had had a number of severe attacks of facial erysipelas at frequent intervals. Marked erosion of the septum. Another attack of erysipelas threatened. Thorough cleansing of the nose caused the symptoms to disappear and she went nine years without another attack.

Man, 53 years, had a very severe attack of facial erysipelas. Nose examined later and marked septal erosion with bloody crusts found. On one occasion the nose became reddened, but treatment of the septum stopped what the patient feared would be another attack of facial erysipelas. In the discussion Dr. S. Johnston said he had seen one case of facial erysipelas having its origin apparently in a perforation of the nasal septum. *Trans. twenty-fifth meeting American Laryngological Association*, 1903.

In Welty's valuable article, besides recording his own experiences and referring to nine similar reports in the literature, he refers to the following presumably unpublished cases: "Dr. Able Johnson, San Francisco, has seen four cases of erysipelas in European clinics. In 2 he was able to demonstrate pus in the nose; 2 followed surgical interference, 1 for extensive removal of polypi, accompanied by pus, 1 following the removal of the inferior turbinated, in which pus was not demonstrated. Dr. Albert Houston, San Francisco, has seen 2 cases follow surgical operation of the nose for the removal of polypi. In the Vienna Nose and Throat Clinic I have seen 3 cases of erysipelas develop while the patients were under treatment. * * * I also observed 3 cases of erysipelas following mastoid operation, 1 in Halle and 2 in Vienna." C. F. Welty, *Journal American Medical Association*, Dec. 22, 1906.

Facial erysipelas being such an extremely common disease and the microbic cause of it having been so firmly established, individual cases of it are no longer reported in the literature, unless for the purpose of noting some complications, such as meningitis, intestinal hemorrhage, orbital abscess or severe ocular complication.

So few have as yet recognized the local origin of the infection that it is only in the literature of Rhinology that a distinct exposition of the predisposing and exciting causes may be found. Knowing, however, that a large amount of valuable data could be secured upon application to the proper sources of knowledge, I addressed a circular letter to the members of the American Laryngological Society, the American Otological Society, the American Academy of Ophthalmology and Oto-Laryngology, and the American Ophthalmological Society.

This letter solicited replies to the following questions:

A.—Have you had any cases of facial erysipelas (or erysipelas of other parts of the body) which you could consider as due to disease of the nose or its accessory sinuses?

B.—Have you had any cases of erysipelas following upon operations performed upon the mastoid for either acute or chronic disease?

C.—Following upon operations performed upon the nose for acute or chronic disease?

D.—Following upon operations performed upon the Antrum of Highmore for acute or chronic disease?

E.—Following upon operations performed upon the ethmoid cells for acute or chronic disease?

F.—Following upon operations performed upon the sphenoid body for acute or chronic disease?

G.—Following upon operations performed upon the Frontal Sinus for acute or chronic disease?

H.—Have you had any cases in which more or less extensive damage was done to the eye as the result of an attack of facial erysipelas, and if so could you trace the cause of the erysipelas in these cases? Did any of these cases have diseased nasal chambers or disease of the accessory cavities?

I have to extend my sincere thanks to the gentlemen of these societies for the very large number of synopses of extremely interesting cases which they have sent me. I appreciate the trouble they have taken and hope they will derive some satisfaction out of having helped to clear up a subject which does not appear to be entirely clear to some of our co-ordinate branches of medicine and surgery.

Five reports of the members of these societies are so voluminous that they must be omitted in this publication. They will appear later in pamphlet form.

Having thus reviewed the facts at some length, and noted the theories put forth by various observers, both American and Continental, let us see to what conclusions these facts, more or less illumiated by these theories, will certainly and unavoidably lead us.

First.—The identity of the streptococcus as the *contagium vivum* or microbial cause of erysipelas is a fact of such universal knowledge as to call for but formal mention. It is necessary, however, to call attention to a few of its characteristics. It is of slow growth and of variable morphology when its environment is changed. Its pathogenicity is also a matter of variability. It is probably but rarely air borne, needing direct per-

sonal contact in the vast majority of instances for its transference so that Ohlmacher speaks of its "well advanced adaptation to parasitism."

Second.—We note the practically constant presence of the streptococcus and the pneumococcus in the normal nose and neighboring spaces such as the throat and the mouth and possibly the normal accessory cavities and the ear. The observations bearing on this fact I have taken care to give you in great detail.

Third.—We recognize the great variability in pathogenicity of both the streptococcus and the pneumococcus. Both, as we know, lie latent for months, for years, and even for an entire human lifetime may bring forth absolutely countless millions of generations upon the hospitable pituitary mucous membranes of their host without betraying by a single overt act their presence. But this quiet and indolent existence may be broken in upon at any moment. Man has again and again produced this disturbance and roused these cocci to virulent fury under laboratory conditions, and nature has produced these same storms in the human host of the streptococcus and the pneumococcus either (a) by temporarily and through some unknown cause inducing virulence in the micro-organisms or (b) through some unfavorable conditions which profoundly affect the patients and alter the constitution of the fluids and probably also the solids of the body, thereby supplying that environment which is necessary to induce the change which we call virulence—which consists essentially in a tremendous stimulation of the reproductive energies of the cocci with an attendant formation of toxins.

Fourth.—This process just referred to is not an unusual one in microbial pathology. We are familiar with practically the same phenomena in the life history of the typhoid bacillus and the bacillus tuberculosis.

Fifth.—The extreme frequency of erysipelas upon the face as compared with its invasion of other parts of the body has been noted for centuries. Only recently has the discovery that the cavities of the bones of the face—indeed, that the whole upper air tract—is the normal habitat of the microbial cause of erysipelas furnished us with a rational explanation of this pre-

dilection, and I have no doubt but that—now that the attention of the general physician and surgeon is called to this matter by the rhinologist—we will find that many mysterious outbreaks of erysipelas or other streptococcus infection will be traced to some diseased nasal passage among the entourage of the patient. I have in mind the case of a distinguished Philadelphia obstetrician (communicated to me by one who was acquainted with the last generation of Philadelphia physicians) who, in the latter years of his life, left behind him a trail of puerperal sepsis which counted some 90 or 100 cases and which was attributed by his colleagues to the fact that he was afflicted with a chronic ozoena.

Sixth.—I have cited to you a large number of spontaneous cases and surgical accidents occurring under the observation of a very small proportion of the trained and educated men who make up our great American medical profession. These cases and accidents are just such as one would expect to occur in a certain proportion of patients under these known conditions. It must be a fact that modern aseptic and antiseptic methods has reduced the number of these infections where the virulence of the cocci has been mild, but the anatomical arrangement of the parts and the fact that virulent streptococci in rapid multiplication are only destroyed by very strong antiseptics of escharotic action makes it impossible to prevent the infection in every case. Think of a virulent streptococcus infection of the mastoid—it is a physical impossibility to prevent a possible infection of the freshly wounded soft parts while the diseased bone is being slowly and carefully chiselled and curetted away—or, again, think of the infected frontal sinus tense with pus, with its exit closed by inflammatory swelling and colonies of streptococci penetrating the mucous membrane, invading the periosteum and eroding the upper layers of the bone. In some cases thorough exenteration of the sinus and the ethmoid cells cannot possibly reach and destroy every fold and crevice of the latter which harbor the multiplying streptococci, and a thorough operation necessarily involves most extensive wounds of the skin and subcutaneous tissue, the mucous membrane and submucous tissue, the periosteum and the bone. And yet the

more violent the inflammatory process, the greater probability, theoretically, that we are in the presence of a virulent infection, the more imperative it is that we should immediately evacuate the pus cavity through a wound of our own making that drainage may be rapid, direct and free, and the life of our patient be not imperilled by the streptococcic invasion of the cranial cavity, the meninges and the brain.

I submit that we have reached that point in our knowledge of this subject where we can say with positiveness that erysipelas is a streptococcus infection, which is almost invariably an autoinfection from the upper air tract of the patient, and that in those rare cases where it is not an autoinfection the infection is derived from the air passages of some one in contact with the patient in some capacity. Modern knowledge of contagion and modern methods of cleanliness have practically entirely done away with the old epidemics of erysipelas that used to invade hospitals or communities some thirty or forty years ago.

In the prosecution of this study I have been struck with the comparative frequency of a serious involvement of the eyes in the course of a facial erysipelas. That corneal ulcers or a kerato-malacia should appear as a result of the violent inflammation of the lids and the tremendous pressure of the palpebral oedema is not to be wondered at—but the fact of the matter is that a variety of conditions supervene from apparently an identical cause—streptococcus infection—and the resultant pathological state must be determined by the local conditions existing in each patient. Apparently we never or rarely see some of these conditions in America. For instance, the French frequently and the Germans occasionally speak of a chronic thickening of the lids which occurs as the result of recurrent facial erysipelas and resembles the condition of the skin in elephantiasis. Lavrand (28) was, I believe, the first to describe this condition, which he observed in a boy of 15. There was no condition of the eye itself which would afford an explanation of this strange phenomena, and Lavrand, therefore, connected it etiologically with a facial erysipelas which had occurred again and again and had always originated in the naso-pharynx. The mucosa of the nose was swollen and Luschka's gland was

enlarged. The treatment of this condition healed the affection of the lids. The correctness of this observation was subsequently confirmed by others. Parinaud, Uhthoff and Winckler (54) have given us excellent descriptions of the various forms of streptococcus conjunctivitis and have connected these directly with disease of the lachrymal drainage apparatus, which, as we know, is itself a result of an inflammation of the nasal mucous membrane. Indeed, Winckler says: "The streptococci as well as the staphylococci, which can produce acute inflammations of the mucosa of the upper respiratory tract, must be considered as etiologic factors in conjunctivitis."

Most authors who describe cases of atrophy of the optic nerve consecutive to attacks of facial erysipelas appear to consider that this is a compression atrophy due to orbital oedema or abscess. This view, as you will observe from the cases cited, cannot always be borne out by the symptoms present or the results of physical examination. Hajek (80), the rhinologist, has pointed out that "the dissemination of the streptococcus in an erysipelatous eye is sufficient cause by itself. Their power to do harm is proportionate to the toxins they produce. Their growth in the lymphatics extends in all directions, so that they travel in dense masses in the direction of the interstitial spaces and they also penetrate the tissues themselves in every direction. If the erysipelas involves the orbit they wander to Tenon's capsule, from here to Tenon's space and optic disc, eventually then to the prolongations of the pia about the nerve and into the connective tissue which ensheaths the central vessels of the optic nerve. Even the walls of the vessels are penetrated by the cocci and thus changes are produced in the vessels themselves." (Wiener med. Jahrbuch, 1887, s. 364.)

In conclusion I would submit for your consideration the following cases of ocular complications due to and occurring in the course of erysipelas of the face, observing merely that they illustrate exhaustively the conditions that have been discussed in this paper.

CASES OF OCULAR DISEASE DUE TO ERYSIPELAS.

Woman, aged 50. Five attacks empyaema right frontal sinus in five months. Upper lids swollen and oedematous—

bony walls tender. Eye normal. Anterior extremity right middle turbinal bathed in pus. Middle turbinectomy. Two days later frontal sinus operation. On the following day pain. T. 100 F. On second day dressings were changed; some oedema of upper lid and slight exophthalmos—wound clean; on raising lid patient exclaimed she could not see. Pupil fixed and semi-dilated. Ophthalmoscopically retina hazy and oedematous; arteries small, inferior temporal artery obliterated; no swelling of disc. Three small hemorrhages about macula. Later atrophy and total blindness. The frontal sinus wound healed promptly. In the discussion which followed Dr. Meierhof stated that he thought the condition was produced by a secondary orbital cellulitis. Arnold H. Knapp, *Archives of Ophthalmology*, Vol. XXX, p. 308 (compare this case with that of E. E. Foster, New Bedford, Mass., and case of J. H. Farlow, Boston, Mass.)

Girl of 18. Entered hospital for her second attack of erysipelas, the first having begun at the ala of the nose. Each attack occurred at a menstrual period. Severe attack. Several days after convalescence began vision failed in one day and she was not able to count fingers. Ophthalmoscopic examination revealed atrophy of the optic nerves. Nothing abnormal with the yellow spot, the retina or the choroid. *Thèse de Bordeaux*, 1887, Colle.

Erysipelas following a wound of the lid. The right eye was closed for one month—when opened was completely blind. Paralysis lev. palp. sup. All the movements of the eye limited. Opacities of the lens. Disc pale—vessels reduced—many completely empty. Pigmented spots in region of macula. *British Medical Journal*, 1878.

Erysipelas.—Orbital Abscess.—Protrusion and immobility of the globe, chemosis. Tumefaction of the lids which were not able to cover the globe. Ophthalmoscopically the fundus appeared whitish, studded with numerous hemorrhages, arteries invisible, numerous veins dilated. Knapp, *Revue d'Ophthalmologie de Dor et Meyer*, 1885.

Woman aged 68. Three months previously facial erysipelas followed by an orbital abscess. Rapid diminution of vision of right eye. Ophthalmoscopically notwithstanding an immature cataract one could determine an optic atrophy. V.-O. Ramirez, N. Montpellier, 1897.

Woman.—Severe attack of facial erysipelas. Abscesses, etc., of the lids. Exophthalmos. Mobility intact. Cornea clear. Anterior chamber normal. Posterior synechia. Lens and media

clear. Ophthalmoscopically, left eye, disc grayish white, slightly excavated, vessels reduced. Vision abolished. Cabannes. Thèse de Bordeaux par Fauveau. 1903-1904, No. 94.

In a Thesis at Basle, 1882, Anton Schwendt gives the following statistics: He studied 44 cases of phlegmon of the orbit, followed by diminution or loss of vision. Sixteen cases were due to erysipelas of the face; 4 of which had a fatal termination through thrombosis of the sinus or meningo-encephalitis. The author added to this group 4 cases not figuring in the statistics where an erysipelas was followed by atrophy of the optic nerve and in which the inflammation of the cellular tissue of the orbit was not demonstrated although probable. As a cause of abscess erysipelas entered into more than one-third of the cases. These cases consecutive to erysipelas are very menacing to the vision. In Schwendt's collection, of 18 attacked, not one recovered. These phlegmons reveal also a high mortality—30.7 per cent. Thèse de Bordeaux, Colle, 1886-1887, No. 106.

Chambermaid, aged 30; attack of erysipelas of moderate severity, terminating on the eighth day. Oedema of the lid, hyperaemia of the conjunctivae—double iritis, with posterior synechiae. Recovery. Vidal, Gazette Med. de Paris, No. 44, 1862.

Floating opacities formed in the vitreous humor constituting a network interrupted here and there by membranes in shreds during the course of a facial erysipelas. Mathias, Recueil de Médecine Militaire, 1869.

Among eight observations gathered by the author there were five monocular optic nerve atrophies and three that were binocular. In the five monocular cases the erysipelas had in two cases been consecutive to a wound of the same side which had not directly injured the eye. In four cases the erysipelas had been more pronounced on or else limited to the side on which the optic atrophy had occurred. In three cases paresis of the lev. palp. sup., restriction of movement of globe, slight exophthalmos—but no decided evidence of orbital abscess. In all cases loss of vision appeared during the course of the erysipelas. The sound eye was not attacked following the atrophy of the nerve. Parinaud, Journal de Médecine et de Chirurgie Pratique, Oct., 1879.

In discussing cases of this character Panas said: "Numerous anastomoses of the ophthalmic vein are known. Recently Gurtwisch has again demonstrated by beautiful injections that numerous vessels unite the ophthalmic to the veins of the pterygo-maxillary fossae and in particular the spheno-palatine. *Semaine Médicale*, 1885.

Lapersonne said, also, that phlebitis of the ophthalmic vein and of the cavernous sinus was known to have been caused by lesions of the mouth, pharynx, lips and nasal fossae, such as septic wounds, furuncles, anthrax and especially erysipelas. *Semaine Médicale*, 1885.

Death on the nineteenth day of a facial erysipelas after delirium, grinding of the teeth, muscular contractures, pupillary irregularity. On the thirteenth day coma, dilated pupils, paralysis. On autopsy, thrombosis of the ophthalmic vein and the transverse sinus, with cloudy effusion into the arachnoid. Weber quoted by Colle. *Thèse de Bordeaux*, 1886-1887, No. 106.

Ripault refers to a case exhibiting crops of chalazia after facial erysipelas, and makes the following citations without giving the name or date of publication: Annular bands or paracentral plaques of the cornea, losses of substance bordering upon perforation of the lens. (Galezowski.) Acute iritis, monocular or binocular (Hanson, Vidal), tardy iritis occurring in convalescence—analogueous to that of typhoid or variola (Dor), neuro-retinitis, with retinal hemorrhages (Sattler), neuro-retinitis due to numerous microbial embolisms (Hernheiser), thrombosis of the central vein (Knapp), detachment of the retina (Heineche). *Des complications oculaires de l'erysipele de la face*. H. Ripault. *Gazette Medicale de Paris*. April 20, 1895.

Case of facial erysipelas: "One week after the beginning of the attack, without previous pain or special local swelling, and without any symptoms in the throat or nose, pus began to flow from the right ear. At this time the walls of the external auditory canal were normal and the pus obviously came from the middle ear through an opening in the drum head."—J. A. Lippincott, *Medical News*, Philadelphia, 1890, LVII, p. 309.

Woman, aged 70; erysipelas of the face having begun at

the nasal orifice on the right side, involving the right half of nose and cheek. Throat red and tongue dry. Followed by optic neuritis and atrophy after oedema of the lids, exophthalmos, ophthalmoplegia externa, chemosis, pupils dilated one-half and clear cornea. F. Ferrien, *Neurite et Atrophie Optique au Cours de l'Erysipele*. (Progres Med. Paris, 1904, xx, p 165.)

Man, aged 53; facial erysipelas that began on mucous membrane of the lower lip. Intense earache; pharyngitis-rhinitis with tumefaction; rupture of m.t.; mastoid red and tender; paracentesis m. t. Recovery. H. V. Wurdemann, *Medical News*, Nov. 21, 1891.

Unilateral orbital abscess, optic neuritis and blindness following facial erysipelas in which there was a continual purulent discharge from the corresponding nostril. Carl, quoted by Fish, *American Journal of Surgery*, Sept. 1906.

Case of erysipelas, redness and swelling of the inner corner of the eye, much periorbital pain, considerable ptosis, limitation of movement, orbital fistula in upper and lower lid, no perception of light. "Several months before the attack he had for a considerable time a yellow discharge from the nostrils—sometimes offensive. This had quite ceased before the erysipelas, and there seems, therefore, very little reason for supposing that the orbital inflammation was propagated from the nose." (!) Nettleship quoted by Fish, *American Journal of Surgery*, Sept., 1906.

(The personal communications to the author from American specialists are so voluminous that they are omitted from this report. They will appear in pamphlet form.)

Bibliography.

(In addition to references given in the text.)

1. Terrien F. & Lesne, *Neurite et atrophie optique au cours de l'erysipele*. Archiv. Gen. de Med. Par, 1903, ii, 2699-2703.

2. Rogers, A. W. Four cases of intercurrent erysipelas in melancholia with rapid recovery or great improvement in each case. J. Am. Med. Assn., 1904, xlii, 647.

3. Izachek, U. B. Erysipeleto-phlegmonous inflammation of the face complicated by purulent meningitis and general pyaemia. Russk Vrach, St. Petersburg., 1904, iii, 1378.

4. Cabanne, *Neurite et atrophie optique dans l'erysipele faciale*. Recueil d'Ophth, 1904, p. 690.

5. Adderio. Asservazioni cliniche sperimentali sult atrofia ottica da resipela faciale. Progresso Ophthalmol, 97.

6. Batut, L. Erysipele de la face, phlebite de la veine ophtalmie, mort. Bull soc med-chir de la drome par, 1906, vii, 158.

7. Castresana y Gorcochea F. B. Erysipela gangrenosa de los parpados con motivo de un caso denico. Corresp. Med. Madrid, 1904, xlix, 485-90.

8. E. Moretti. Sopra un caso di dacriodenite orbitaria suppurata consecutiva ad erisipela faciale. Ann di Ottal, Pavia. 1905, xxiv, 3-32.

9. Henry. Univ. Med. Mag., Phila., 1889-90, ii, 25.

10. Tissier. Ann. Mal. de l'oreille du larynx, etc., 1892, xviii, 807-820.

11. Mermet. Gaz. Hop. Par., 1897, lxx, 229-234.

12. Harwood. Am. Pract. & News, 1887, iii, 264.

13. Ranirez. N. Montpel. Med., 897.

14. Luc. La France Médicale, May 15, 1891, No. 20.

15. A. Chenod. Bacteriologie et parasitologie cliniques des paupieres. Th. de Paris, 1894, p. 64.

16. P. Achalme. Considerations pathogeniques et anatomo-pathologiques sur l'erysipele, ses formes et ses complications. Th. de Paris, 1892.

17. J. Widmark. Etude bacteriologiques sur la dacryocystite et l'ulcers serpens de la cornee. Nord. Med. Oak, 1884, T. xvi, p. 1, et études bacteriologique sur la dacryocystite, la keratite a hypopyon, la blepharadenite et la dacryocystite phlegmonense. Hygica, 1885, T. xlvii, p. 581.

18. Michel. Krankheiten der Lider, in Handbuch der Augenheilkunde de. A. Graefe et Th. Selmich, 1876, Bd. iv, p. 391.

19. P. Spilmann & L. Gauzinotte. Dict. Encycl. des. sc. Med. art. Erysipele, 1887, s.i.t., xxxv, p. 487.

20. Trelat. Erysipele phlegmoneux des paupieres, lecons de clinique chirurgicale a l'hopital de la charite, 1877, p. 50.

21. Lawrence. A singular case of erysipelatous inflammation of the lower eyelid terminating in gangrene in the short space of thirty-six hours. The Lancet, 826, t. x, p. 127.

22. De Schweinitz. Erysipelas of eyelids spreading extensively to face and scalp; orbital cellulitis; recovery without impairment of vision. Philadelphia Hosp. Reports, 1890, vol. 1, p. 302.

23. A. Elschnig Ueber gangroen der Lidhaut, Klinmonatsbl. f. Augenheilk, 1893, t. xxxi, p. 191.

24. Valude. Phlegmon gangreneux des paupieres et de l'orbite, septicemi et mort. France Med., 1890, t. xxxvii, p. 22.

25. Pedraglia et Deutschmann. Chronisches Lidoedem bei erysipelasartiger Entzündung mit Tumorenbildung an den Lidrandem. Archiv. f. Ophthal., 1888, T. xxxiv, 1 Abth., p. 161.

26. Liebrecht Eine seltene Lidkrankheit. Deutsche Med. Wochensch, 1889.

27. A. Smith. Solid oedema of the eyelids following repeated attacks of erysipelas. *Illus. Med. News*, London, 1889, vol. v., p. 197.
28. Lavrand. Oedeme chronique des paupieres consecutif a des erysipeles faciaux a repetition d'origine pharyngee. *Rev. Mens. de Laryn. d'Otol. et de Rhinol.*, 1889, t. ix, p. 378.
29. Fage. Un cas d'elephantiasis des paupieres. *Ann. d'oculist*, 1892, t., p. 276.
30. Renaut. Contribution a l'etude anatomique de l'erysipele at des oedemes. *Th. de Paris*, 1874. Barallier, cited by Spillmann & Gauzinotte, 1. c.
31. A. Follet. Sur les pathogenie de l'elephantiasis et de quelques etats elephantiasiques. *Th. de Paris*, 1895, p. 7.
32. Chauveau. Experimentation. *Lyon Med.*, 1882.
33. Arloing. *C. R. de l'Academ. des Sc.*, 1884.
34. Widal. *Bull de l'Acad. de Med.*, 1888.
35. Sabourand. Parasitologie de l'elephantiasis nostras *Ann. de dermatol et de syph.*, 1892, p. 592.
36. Thompson & Hewlett. *Trans. Royal Med. Chi. Soc.*, London, vol. lxxviii, p. 239, 1895.
37. Park & Wright. *Ann. d. Mal. de l'Oreille, etc.* Nov. and Feb., 1898, Paris. *N. Y. Med. Journ.*, 1898, Feb. 5.
38. Hasslauer. *Centralbl. f. Bacteriologie B.* xxxiii, s. 47-51, *Journ.*, 1902.
39. Viollet. *Thèse*, Paris, 1899, p. 50.
40. Paulsen. *Centralbl. f. Bacter.* B. viii, s. 344, Jena, 1890.
41. Strauss. *Archiv. de Med. Experi et d'anat., path.* T. 6, p. 633. Paris, 1894.
42. Von Besser. *Beitrag z. path. Anat. B.* vi, s. 331, Jena, 1889.
43. Lewis & Turner. From the Lab. of the Royal College of Physicians, Edin., *Edinburgh Med. Journ.*, Nov. 1905.
44. Törne. *Centralbl. f. Bacteriol.* Jena, 1903, Bd. xxxiii, s. 250-255.
45. Pearce. *Journal Boston, Soc. Med. Sc.*, March, 1899.
46. Kirkland & Stacey. *Journ. of Laryngol.* London, 1902, vol. xvii, pp. 561-566.
47. Herzfeld & Hermann. *Archiv. f. Laryngol & Rhin.*, Berlin, 1895.
48. Howard & Ingersoll. *Am. Journ. Med. Sci.*, Phila., 1898, vol. cxv, p. 520.
49. Stanculeanu & Baup. *Archiv. d. Sc. med.*, 1900, p. 121.
50. C. J. Lewis and A. Logan Turner. "Suppuration in the Accessory Sinuses of the Nose; a Bacteriological and Clinical Research." *Edinburgh Medical Journ.*, Nov., 1905.
51. C. Janson, Stockholm. Causes of Infection in Facial

Erysipelas. Fordhandler vid Forsta Nordiska Kongressen, Aug., 1896, i, p. 62.

52. J. W. Farlow. Facial Erysipelas from Erosions of the Nasal Septum. Trans. American Laryngological Assn., 1903.

53. J. A. White. Mastoid Operation Followed by Facial Erysipelas. The Laryngoscope, St. Louis, 1904, iv, p. 689.

54. Ernst Winckler. Ueber Beziehungen zwischen einigen Affektionen der Nase wie des Rachens und Augenkrankungen, Bremen.

55. David Coggin. Loss of Vision of Both Eyes After Erysipelas. Trans. Am. Ophthalmological Society, 1879.

56. S. T. Darling. Pathologist Ancon Hospital, Isthmus of Panama. "The Accessory Nasal Sinuses and Pneumococcus Infections." Jour. Am. Med. Assn., Nov. 10, 1906.

57. Frankel. Deutsche Med. Wochensch., No. 44, 1891.

58. Ohlmacher in Hektoen and Riesmann's Am. Text Book of Pathology.

59. Emile Prene Fauveau. Des neurites et atrophies du nerf optique a la suite de l'erysipele de la face. These de Bordeaux. No. 94, 1903-1904.

60. Galezowski. Ocular complications in Facial Erysipelas. Journ. d'Ophthalmologie, July, 1876.

61. Schieffers. De l'erysipele des fosses nasales. Revue de Laryn. otol. rhinol., Mars. i, 1889.

62. Gerhardt (Berlin), Klin. Wochenschr., No. 3, s. 45, 1887.

63. Friedrich, P. E. Rhinologie Laryngologie and Otologie in ihre Bedeutung fur die Allgemeine Medicin. Leipsic, 1899.

64. Zarniko, Carl. Die Krankheiten der Nase, Ihre Nebenhohlen und des Nasenrachenraumes.

65. Garel. Annales des Mal. de l'Oreilles, May, 1891.

66. Jordan. Archiv. f. Chirurgie, 42, ii, 1891.

67. Peters. Muench. Med. Wochenschr. Jan. 17, 1906.

68. V. Maxmovitch. Archiv. f. klin. Med. Bd. lxxxiii.

69. H. Roger. Contribution a l'etude clinique de l'erysipele d'apres, 957 observations personnelles.

70. H. M. Fletcher. "Some Suggestions as to the Relation of the Teeth to Empyema of the Maxillary Sinus." Journal American Med. Assn., Dec. 30, 1893.

71. Surgical Pathology and Therapeutics, John Collins Warren, 1895.

72. Fraenkel. Deutsche Medizin. Wochensch., No. 44, 1891.

73. Iglaue. "Some of the Bacteria Found in the Nose, Laryngoscope." Nov., 1901.

74. Politzer. Diseases of the Ear. 1902.

75. Dench & Cunningham. Transactions American Otological Society. 1902.

76. H. M. Fish. "On the Frequency of Blindness Due to an Affection of the Accessory Sinuses." *American Journal of Surgery.* Sept., 1906.

77. G. W. Spohn. *Detroit Medical Journal*, 1904, s. iv, p. 361.

78. C. F. Welty. Acute and Chronic Suppuration of the Ear and Nose, the Direct Cause of Facial Erysipelas. *Journal of the American Medical Assn.* Dec. 22, 1906.

79. O. Stein. *Chicago Medical Recorder*, vol. xvii, p. 308, 1899.

80. Hajek. *Pathol. u. Therap. der Entzünd. Erkrank. der Nebenhohlen der Nase*, 1899.

81. Mercier. Bellevue, "Un cas d'erysipele de la face d'origine sinusienne." *Societe des Sciences Medicales de Poitiers. Le Poitou medical revue mensuelle*, No. 11, Nov. 1, 1903. Poitiers.

82. A. W. deRoaldes. "Cases of Alarming Epistaxis of Grippal Origin, with Remarks on the Danger of Post-Nasal Plugging." *N. Y. Med. Record.* Oct. 14. 1893.

TUBERCULOSIS OF THE ACCESSORY SINUSES OF THE NOSE.

BY J. W. GLEITSMANN, M. D.

Although Tuberculosis of the Accessory Sinuses is a rare occurrence, and more of pathological than clinical interest, it is, nevertheless, of sufficient importance to engage your attention in more than one direction.

Pulmonary tuberculosis furnishing by far the largest mortality, it would not be surprising if in life, or, at least, at post mortem, accessory sinus diseases were more frequently observed, and investigations as to their relation are not missing. Of the many authors who examined the sinuses of patients having died from tuberculosis I shall quote only a few. Wertheim (1) found in 306 post mortems 165 times and amongst 106 tuberculous subjects 31 times accessory sinus disease in general; Minder (2) found in 17 tubercular cases the sinuses diseased 4 times; E. Fraenkel (3) in 48 cases 9 times; Dmochowski (4) confined himself to the maxillary sinus and saw in 29 tubercular subjects only 3 times pathological changes. He is also the only one who, to the best of my knowledge and with a careful search of the literature, found tubercle bacilli in an accessory sinus, viz., the maxillary, which had not been diagnosed or treated during life. A much larger ratio appears in a recent publication by Oppikofer (5), viz., 25 sinus affections in 51 tuberculosis cases. But, with the exception of the last author, the writers are not inclined to believe tuberculosis to be a preponderant cause for general sinus disease, other affections, especially empyema, being by far more prevalent.

It is difficult to determine the etiological factor in many instances, as several writers confine themselves to the short report of the observation of a case and important data are missing; but from the histories furnished we learn what is to

be expected, viz., that the majority of sinus tuberculosis is due to an extension from a neighboring tuberculous focus. Of the twenty cases of tuberculosis of the maxillary sinus which I could find, twelve were due to tuberculous lesions of the bones of the nose or upper maxilla, whilst in the remaining eight carious processes of these parts can be excluded. The majority of patients suffered from pulmonary tuberculosis, and a few only had the well-known symptoms of antral empyema, without any constitutional disturbances; but at operation tubercle bacilli were found in the discharge evacuated. In eight instances the presence of tubercle bacilli in the antral secretion was verified by microscopical examination.

Tuberculosis of the other accessory sinuses seems to be extremely rare, viz., four cases of the frontal sinus and one of the ethmoidal and sphenoidal sinus combined, which latter presented a most extended and destructive lesion of all the four sinuses.

The pathological conditions in sinus tuberculosis are very much the same as in nasal tuberculosis. Aside from the manifest lesions, as empyema, exuberant granulations, cheesy deposits, caries, mentioned by the writers, Weinberger (6) made careful microscopical sections of the diseased antral mucous membrane. The epithelium was exfoliated in many places, and a considerable small-celled infiltration had set in, penetrating the superficial as well as the deep layers of the mucosa, whilst the middle strata showed the fibrous structure of the connective tissue containing serous liquid and some leucocytes. The efferent glandular ducts and their lumina were enlarged, giving rise to cystic spaces, and giant cells were found in the infiltrated tissue. In his case no tubercle bacilli could be found in ten sections made.

Although in many cases we have to be satisfied with the clinical statement of tuberculosis, without the proof of the presence of tubercle bacilli, and a rigorous critic might feel inclined for this reason to eliminate one or the other case, I have ample reason to believe that all the reports have been made in good faith, and I personally have no doubt as to their true tuberculous nature. All the references in this paper have

been searched for and read by myself in their original publications, and I can vouch for their correctness. Tuberculosis of the maxillary sinus has been reported by Coakley (7), Demme (8), Gaudier (9), Gruenwald (10) (two cases), Keckwick (11), Neufeld (12), Neumayer (13), Réthi (14) (two cases), Weinberger (6), Maydl (15), Avellis (16), Panse (17), Dmochowski (4), Killian (18), M. Schmidt (19), Zander (20) (two cases), and Wertheim (1). In my opinion, more tuberculous sinus cases do occur, and would be reported as such if the contents of the sinus were regularly examined and the nature of the morbid process more carefully studied. Avellis quotes a number of authors relating cases of antral empyema similar to his own in which empyema had previously been diagnosed, but a tuberculous lesion, due to extension of caries, and tubercle bacilli were found when he took charge of the child.

I shall not weary you with a narration of each individual case, and only refer to some clinical features in general and relate a few especially interesting histories. The presence of caries in twelve cases has already been mentioned. Empyema, although not always specifically stated, can be assumed to have been present, with exception of three cases. Extension of tuberculosis from a diseased alveolar process through a dental fistula took place five times, through the canine fossa once. Lupus of the nose was the cause in two patients.

Only three cases could be found in which the tuberculous process was confined to the antrum of Highmore alone, without manifestations in any other locality. Our member, Dr. Coakley—further, Gaudier and Keckwick—were fortunate enough not only to observe this extremely rare occurrence, but also to be able to report a cure at the time of their publication. Coakley's case presented the usual symptoms of antral empyema, but after the operation tubercle bacilli were found in the discharge. The lungs were examined by Drs. Le Fevre and Janeway one month later and found healthy. Gaudier's patient, a man of forty years, suffered for several years from toothache and discharge in the left nostril. An exploratory puncture in the lower meatal wall revealed bacilli in the evacuated pus, and was followed by the radical operation through the canine fossa and,

with appropriate treatment, by a cure. Gaudier emphasizes the rarity of his case, in which tuberculosis was limited to the sinus and only symptoms of empyema existed. Keckwick, a British dental surgeon, has the misfortune, not only to have his name misspelled wherever quoted and to appear in a standard throat work under a different name in the text from that in the literature appended, but also to have his publication everywhere referred to journals giving abstracts only, and never to the original, with one exception. His patient, a woman of thirty years, had the usual symptoms of empyema of the sinus, which was opened through the socket of the second bicuspid and treated without improvement during twelve months. At last the pus was examined, tubercle bacilli found and the patient discharged, cured, after three months, but later lost sight of.

Two more cases had a favorable issue. In the patient of Neufeld the disease began at the alveolar process, from which a fistula extended into the sinus, which was freely opened, curetted and a sequester removed. The communication between mouth and sinus remained and was kept closed by a plate. Demme's patient was a nurse who had attended to four children of non-tuberculous parents, but who all four died from primary intestinal tuberculosis. A few months after the death of the fourth child the nurse consulted the doctor for a dental fistula existing several years and a recent facial neuralgia. Demme found an old lupus at the septum, swelling of the face and a putrid secretion from the fistula of the right molar. Repeated scrapings and cleansings effected a cure. The infection of the children was caused by the habit of the nurse of tasting the food before giving it to the children.

The last case I shall relate is the severest I found on record, affecting all the four sinuses and having a rapid fatal issue. Panse saw a sixteen-year-old girl who had been operated upon several times for nasal polypi. One month after the last operation she became suddenly blind. As disease of the frontal or sphenoidal sinus, involving the optic nerve, was suspected, they were opened and necrotic bone removed. Antisyphilitic treatment had no effect; the patient's condition grew worse and,

after giant cells had been found, an extensive operation was performed, consisting in splitting of the nose, removal of the nasal bones, the ethmoidal and sphenoidal bone, with exposure of the cerebral frontal lobe. Death took place after a short improvement. At post mortem an old, diseased focus was found in the apex of the right lung, tuberculosis of the cervical and bronchial glands, destruction of the optic nerve, circumscribed meningitis and a tuberculous focus in the middle of the left parietal bone, with cheesy pus.

Panse's case is the only one I could find in which tuberculosis of the ethmoidal and sphenoidal sinus occurred. It is also one of the four frontal sinus cases on record. The other three have been published by Frank and Kunze (21), Vohsen (22) and Schenke (23). Frank and Kunze's patient had general tuberculosis, a swelling at the frontal sinus region, and at operation cheesy masses and a focus at the posterior sinus wall extending to the dura were found. Vohsen's case had a fistula in the frontal region, leading to a carious bone, and cheesy masses in the sinus. The ultimate issue is not stated in both cases. A typical case is reported by Schenke of a man, 18 years of age, who suffered from tuberculosis of the middle ear and of the cervical glands. When admitted to the hospital, he had a swelling of the frontal region and a fistula of the mastoid process, extending posteriorly toward the cranial basis, and another one leading to the styloid process. A few days after the fistulous ducts had been scraped, the frontal sinus was operated, and tuberculous masses appeared already after incision of the skin. A fistula led to the left sinus, which was thoroughly curetted after complete removal of its anterior wall and communication with the nose was established. Death took place twelve days after his admission. Post mortem showed an abscess of the left mastoid process, extending to the cranial base, and the occipital foramen, into the interior of the cranial cavity, tuberculosis of the frontal sinus, but no perforation into the cranial cavity.

From all the data related, it is evident that the prognosis is as unfavorable as the treatment is unsatisfactory. If we analyze the cases carefully, we cannot say with any degree of

certainly if one of the few patients who appeared cured at the time of the publication remained so definitely, as they were not observed sufficiently long after the operation. On the other hand, Panse's case teaches us what rapid and destructive lesions can occur in accessory sinus tuberculosis.

The treatment is eminently surgical, and does not differ much from the proceedings generally adopted in severe cases of empyema of the sinuses. It has naturally to be more radical, as not only the soft parts, but also the diseased osseous tissue, have to be carefully and thoroughly removed, to eliminate if possible all traces of the area involved. Supporting the general health, combatting the drain on the system and encouraging the patient's mental condition is our duty here as well as in many other serious diseases. I am not prepared to say if specific treatment with tuberculin or its many derivatives would make any impression on the tuberculous process of the sinuses. No author mentioned it, and I have reason to doubt its efficacy in our affection, as their action is principally confined to the elimination of the tubercle bacilli, which were only found in a minority of the cases, whilst they do not influence directly the conditions due to the extension of the process. The same will hold good of the opsonin-tuberculin method, so much in vogue now in England. But in these desperate cases I would not hesitate to use all the means at our command, and give a thorough trial to the specific treatment, to which I feel encouraged by the favorable results observed in uncomplicated nasal-tuberculosis.

Bibliography.

1. *Wertheim, Edmund.* Beitræge zur Pathologie und Klinik der Erkrankungen der Nasennebenhöhlen. Archiv fuer Laryngologie xi, 1901, p. 169.

2. *Minder.* Die Sectionsbefunde der Nase und deren Nebenhöhlen unter Berücksichtigung der Gesichtsschädelmasse Ibid xii, 1902, p. 329.

3. *Fraenkel, Eug.* Beitræge zur Pathologie und Aetiologie der Nebenhöhlen-Erkrankungen. Virchow's Archiv, 1896, vol. 143, p. 42.

4. *Dmochowski, Z.* Beitrag zur pathologischen Anatomie und

Aetiologie der entzündlichen Processe im Antrum Highmori. Archiv fuer Laryngologie iii, 1905, p. 255.

5. *Oppikofer, Ernst*. Beitræge zur normalen und pathologischen Anatomie der Nase und ihrer Nebenhöhlen. Ibid xix, 1906, p. 28.

6. *Weinberger, Max*. Ueber fort geplanzte Tuberculose der Kieferhöhlen. Monatsschrift fuer Ohrenheilkunde, 1903, April, p. 151.

7. *Coakley, C. G.* A case of Tuberculosis of the Antrum of Highmore. N. Y. University, Bull. of the Medical Sciences, 1902, vol. ii. No. 3, p. 121.

8. *Demme, R.* Klinische Mittheilungen aus dem Gebiete der Kinderheilkunde. 27ter Bericht des Jennerschen Kinderhospitals. Bern, 1889, p. iii.

9. *Gaudier, H.* Empyeme de sinus maxillaire de nature tuberculeuse. Intervention par la fosse canine. Guerison. Revue Hebdom. de Laryngologie, etc., 1897, No. 44, October 30.

10. *Gruenwald, Ludwig*. Die Lehre von den Naseneriterungen. Muenchen. J. F. Lehmann, 1896, Zweite Auflage, p. 295.

11. *Keckwick, John*. Antral Empyema of tuberculous origin. British Journal of Dental Science, 1895, May 13th, p. 433.

12. *Neufeld, Ludwig*. Tuberculose, Syphilis und Kieferhöhlenentzündung. Archiv fuer Laryngologie xvii, 1905, p. 215.

13. *Neumayer, H.* Ein Fall von Mund-Kieferhöhlen und

14. *Réthy, L.* Ein Fall von Tuberculose der Mundhöhle mit Nasentuberculose. Ibid ii, 1895, p. 260.

Durchbruch in die Nasen und Kieferhöhle. Wiener Medizinische Presse, 1893, No. 19, May 7. Ein weiterer Fall von Tuberculose der Kieferhöhlen, Ibid, 1899, No. 51.

15. *Maydl*. Kieferhöhlen Tuberculose. Wiener klinische Wochenschrift, 1889, No. 51, Dec. 19, p. 988.

16. *Avellis, Georg*. Ueber die bei kleinen Kindern ein Kieferhöhlen Empyem vortauschende Tuberculose des Oberkiefers. Muenchener Medizinische Wochenschrift, 1898, No. 45.

17. *Pause, Rudolph*. Ein Fall von Kiefer und Keilbein Tuberculose mit toedtlichem Ausgang. Archiv fuer Laryngologie xi, 1901, p. 478.

18. *Killian, Gustav*. Meine Erfahrungen ueber die Kieferhöhlenentzündung. Muenchener Medizinische Wochenschrift, No. 4, 5, 6, 1892.

19. *Schmidt, Moritz*. Die Krankheiten der oberen Luftwege. Berlin. Gul. Springer, 1897. Zweite Auflage, p. 312.

20. *Zander*. Empyema Antri Highmori, Dissertatio, Halle, 1894.

21. *Frank J. and Kunze S.* Tuberculosis of the Frontal Sinus. N. Y. Medical Record, 1894, November 3.

22. *Vohsen, K.* Durchleuchtung der Highmorschöhle und des

Sinus Frontalis zur Diagnose ihrer Erkrankungen und deren operativen Behandlung. Verhandlungen des X Internationalen Medizinischen Congresses, Berlin, 1890, Vol. iv, Part 12, p. 33.

23. *Schenke, Heinrich.* Ueber die Stirnhöhlen und ihre Erkrankungen. Dissertatio, Jena, 1898, Anton Kaempfe, p. 22.

Discussion.

Dr. Cornelius G. Coakley: The case referred to by Dr. Gleitsmann was one that was accidentally discovered in the pathological examination of the tissue removed from the antrum. Both antra were completely filled with thickened, edematous polyphoid membrane, not different from that often found. There was no gross pathological evidence of tuberculosis that could be determined. It was only on microscopic examination that the mucous membrane of one side was found to be tuberculous. Giant cells with tubercle bacilli in them were found, thus making the diagnosis of tuberculosis positive. This is the only case of tuberculous infection that I have found in the mucous membrane taken from diseased cavities of the accessory sinuses of the nose. The case came to the out-patient department of our clinic, and was under observation for about two years and a half or three years after the operation, and the last time I saw the patient was a little over a year ago. At that time, he had no evidence of tuberculosis in any other portion of the body.

Prof. Gustav Killian, Freiburg, Germany, present as the Guest of the Association: In the course of recent years I have observed a case of secondary tuberculosis of the left frontal sinus in a patient who presented at the same time tuberculous changes in the bones in several places. Over the left frontal one was an abscess, and when I had opened the sinus I found its mucosa in the temporal recess tuberculous also. Microscopical examination revealed diffuse infiltration and miliary tubercles with giant cells. At the same site the bone also was tuberculous, not alone in the immediate vicinity of the sinus but also toward the temporal region and above it. I was compelled to make an extensive resection of the bone whereby the dura was exposed and recognized as being in a healthy condition. There was a distinct demarkation between the diseased and healthy bone. The former had a yellow color and was bloodless, while the latter had a fresh, red, healthy appearance. In spite of the radical character of the operation and primary healing, recurrence took place. In connection with tuberculous bony caries, I have often observed secondary tuberculous lesions of the antral mucosa in children. Under these circumstances pus

is usually wanting in the cavity. Most frequently the lesion is localized in the outer portion of the inferior orbital wall.

Dr. Harris P. Mosher: The kind of tuberculosis described in the paper is a high grade of tuberculosis. There is, however, another form, a low grade. Recent work has brought this type of tuberculosis to the front. The ophthalmologists have long had to deal with a low form of scleritis, which was rebellious to treatment and of unknown origin. During the last six months this has been proved to be a low form of tuberculosis. The diagnosis is made by the injection of tuberculin and tuberculin is used for treatment. With this work in mind I have been watching all my sinuses cases, giving tuberculin in the hope of getting a reaction. So far I have not had any, but one of my colleagues was more fortunate. In a typical case of empyema of the ethmoidal labyrinth, with a fistula over the inner canthus of the eye tuberculin gave a reaction. It seems probable that a low grade tuberculosis is one of the causes of chronic suppuration in the accessory sinuses. It is a valuable point that tuberculin not only will make the diagnosis in such cases but can be used for treatment.

Dr. Henry L. Swain: Is there any local reaction?

Dr. Mosher: No.

Dr. Swain: Would you use the tuberculin if there were advanced pulmonary tuberculosis?

Dr. Mosher: Tuberculin does very little good. I should not expect to get any result. I should use plain surgery.

Dr. Gleitsmann: I am very happy, indeed, to hear from Dr. Coakley that his case was still living a year ago. I hope the patient is alive now and that he may live a long time; because he is, very likely, about the only surviving case of sinus-tuberculosis. On the other hand, I am glad that the last very interesting case of Professor Killian has not been published yet; which explains its omission in my paper.

Dr. J. Solis Cohen: That makes the discussion the more interesting.

Dr. Gleitsmann: The subject touched upon by Dr. Mosher I did not expect to come before the society in connection with my paper. I do not know whether he referred to some investigations made abroad by Dr. Bartel, recently published in the *Wiener Klinische Wochenschrift*, who spoke of some investigations made by Weischelbaum, in which they tried to find out what constitutes what was known some years ago as the pretubercular stage. Bartel has advanced the theory that before the appearance of tubercle bacilli a lymphoid swelling, a hyperplasia exists, which can last a long time, and during its presence attenuation of the tubercle bacilli and return to normal condition can take place. This lymphoid swelling precedes

a pyogenic as well as a tuberculous infection, and the ultimate result in the latter is the tubercle, in the former the abscess.

As to the therapeutic effect of the different culture products of tubercle bacilli in other words of specific medication, I can only repeat what I have said on several previous occasions, that with the selection of proper cases and the necessary precaution in their use I have fully convinced myself of their beneficial effect. I have cured a number of patients, even under adverse circumstances, who had bacillar sputum, and who after conclusion of treatment had been observed and found well for several years.

Dr. Mosher: When you have active bacilli, you get little results from tuberculin.

Dr. Gleitsmann: I did not bring up this subject. The main use of tuberculin and its derivatives is to destroy the bacilli. They will not do any good in mixed infections. They will not reduce or affect favorably cheesy tissue. They only affect the bacillus. Dr. Mosher will find a number of publications in which tuberculin and its derivatives, among which I include all the preparations based on the production of tuberculin, have relieved the tuberculous process in a large percentage of cases of primary tuberculosis in which mixed infection did not exist.

LARGE TUMOR OF THE LARYNGO-PHARYNX REMOVED BY SUB-HYOID PHARYNGOTOMY.

BY WALTER F. CHAPPELL, M. D.

A brief history will be given of the patient on whom the operation of pharyngotomy was performed.

Johanna, Austrian, aged 51. Mother died at 82 of asthma. Father still living at 91. When 18 Johanna developed a short, dry cough which persisted for some years and was accompanied by considerable expectoration. At 36 she had a severe attack of grippe, lasting three months and leaving her voice hoarse. A year later her last child was born, and was followed by a temporary improvement in her hoarseness.

At 45 her breathing became slightly labored during the day, but at night when asleep it was much worse and soon became so bad that people living in the same house thought she was in danger of suffocation. These symptoms gradually increased and the patient and friends thought she had asthma. A physician saw her once, but she did not visit him again, owing to the belief that she had incurable asthma.

Two years ago she started to choke on particles of food, occasionally vomited a meal. Her breathing became more embarrassed and she slept only at intervals at night; as a result she began to feel weak and would fall asleep during the day and even during a conversation. During the last few months she was wakened every morning with a severe headache and dizziness, which passed away after she was up. I saw Johanna on November 29th for the first time.

A laryngoscopic examination revealed a large mass of grayish blue color completely filling the laryngo-pharynx. It pressed the epiglottis forward against the root of the tongue, laterally it touched the pharyngeal wall and posteriorly the post-pharyngeal wall, extending downward some distance. In fact, it was difficult to understand how the patient could breathe or take nourishment. The surface was covered with large, tortuous vessels which seemed to spring from a common origin on the left side near the posterior part of the ary-epiglottic fold and spread out like the ribs of an open fan over the surface of the tumor, as shown in Fig. 1. No part of the larynx was visible, and

there was no external evidence of the large intra-laryngeal growth.

The respiration was so much impeded at all times that it was considered unsafe to allow the patient to remain in a condition which might prove fatal at any moment. She was admitted to the Manhattan Eye, Ear and Throat Hospital, and a low tracheotomy was performed under local anesthesia on November 30th. The difficult breathing was immediately relieved on the introduction of a tracheal tube and more nourish-

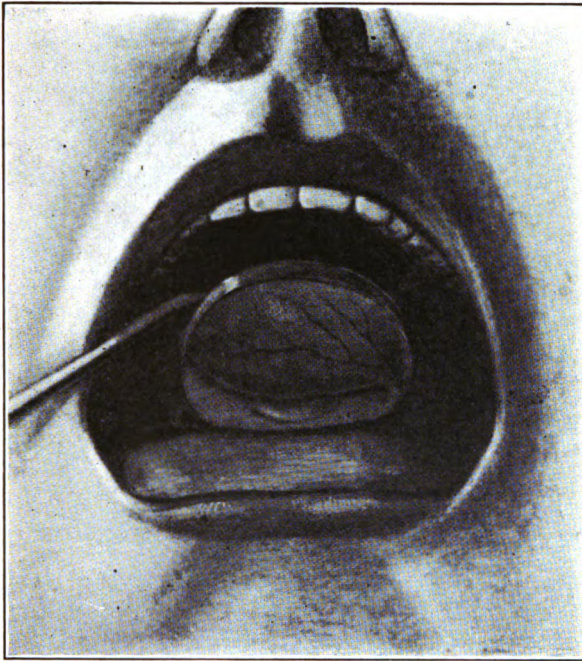


Fig. 1.

ment could be taken with much less effort and discomfort. No bronchitis or other unsatisfactory symptoms followed the tracheotomy, and within a week the patient was well.

On December 28th the throat and tumor were thoroughly cocaineized and an effort made to engage the growth in the loop of a cold wire snare. It was then discovered that, while the pedicle was not over an inch in width and diameter, several adhesions, such as shown in Fig. 2, kept the tumor somewhat firmly in place. It was also found that the posterior end of

the tumor extended down the oesophagus for some distance. It was suggested, by some who were present at the examination, that the tumor was a cyst, but the introduction of a curved knife proved it to be solid and very vascular. An external operation was then advised.

On January 4th, assisted by Dr. Harmon Smith and Dr. John E. MacKenty, I performed a sub-hyoid pharyngotomy. The



Fig. 2.

steps of the operation need hardly be repeated in detail before this audience.

On opening the thyro-hyoid membrane and pulling the epiglottis forward the tumor came into view. Its position and appearance is remarkably well shown in Fig. 3, which was drawn by Mr. K. K. Bosse from sketches and notes taken at the time of operation. The pedicle was found close to the

left ary-epiglottic fold, and from appearances seemed to consist mostly of large vessels. A black silk ligature was used in tying the pedicle, as it was feared anything else might not hold during vomiting or swallowing. Later these silk ligatures had to be removed through the mouth, and I believe chromacized gut would have answered every purpose.

It was found that the tumor was covered with a thick, vascu-

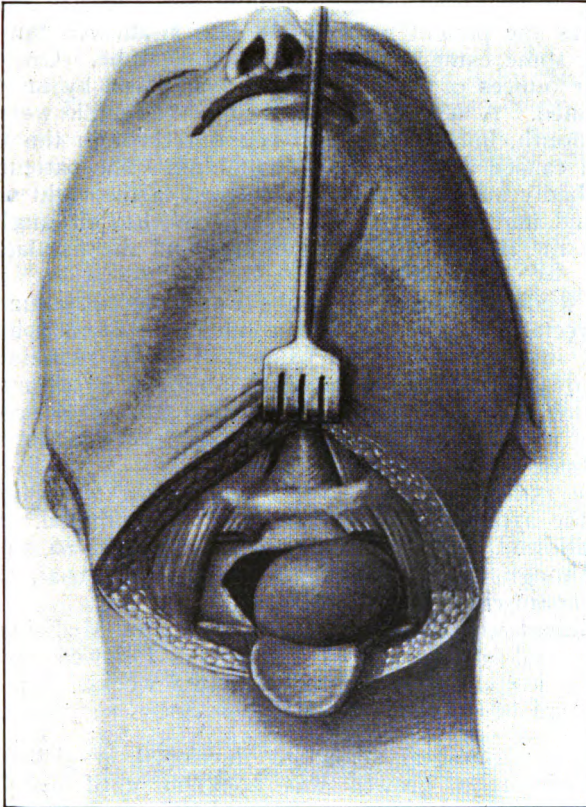


Fig. 3.

lar capsule, which was incised at the right end and the growth removed. The capsule was cut off at the pedicle and bled very little. The larynx and oesophagus were examined and found to be in their normal condition. The thyro-hyoid membrane, muscular and cutaneous tissues were stitched together separately and the patient returned to bed.

The tumor was smooth, irregular in shape, weight 20 grammes after it had been in formalin, circumference $4\frac{1}{2}$ inches. The tumor on microscopic examination was found to consist of fibrous tissue, very moderately supplied with nuclei and round cells.

Absolute rest of the organs of deglutition was ordered, and nutritive and saline enemata were given. Considerable blood was coughed out of the tracheal tube for twenty-four hours, but then ceased. On January 10th as much sterile water was ordered as the patient wanted and was swallowed fairly well, although some came through the tracheal tube. On January 14th four ounces of peptonized milk was given by mouth, but not retained. A few days later broths and milk were given by the mouth, but a great deal ran out through the tracheal tube and caused a good deal of coughing. The patient began to look badly and a small fistula formed in the right angle of the wound and soon another formed in the left angle. All fluids by the mouth were discontinued and the fistulae closed at once.

Nasal feeding through the tube was ordered January 25th and all rectal nourishment discontinued. A decided improvement set in; but some joint pains and slight redness of the gums showed that the feeding had not been all that was required and that the patient had a mild attack of scorbutus. Plenty of orange juice, through the nasal tube, soon relieved the scorbutic condition.

On the 15th of February the tracheal tube was taken out, and on the 27th the nasal feeding was discontinued. Liquids were swallowed well and some solid food was given on March 1st. Although some coughing followed each meal, the diet was not again changed.

The patient was shown at the Academy of Medicine about this time and caught a cold which was followed by some bronchitis, keeping her in bed over two weeks. On March 30th the patient left the hospital.

Remarks. Laryngeal symptoms developed in girlhood, but no evidence of a growth was apparent until many years later. The growth of the tumor was slow, and implicated first, respiration, and later deglutition. It seems remarkable that so large a growth could exist for so many years without causing any great distress. The patient's health was remarkably good at all times and she seems to have suffered very little.

The tracheotomy and major operation were well borne. The temperature for ten days after the operation for pharyngotomy never rose above 100 degrees F.; in fact, beyond a slight cough, the patient had no bad symptoms until she began to take milk

and broth by the mouth; about one-half of these fluids passed down the oesophagus and the balance entered the larynx, most of it passing out through the tracheal tube, but some trickled down the trachea and large bronchi. Quite a sharp attack of tracheitis and bronchitis followed, but soon ceased when nasal feeding was instituted. Rectal and nasal feeding for at least six weeks following the operation would have prevented some of our troubles.

After the tracheal tube was removed solid food had to be taken slowly, as there was some difficulty in swallowing, due to considerable swelling of the left arytenoid. This swelling was caused by the irritation of one of the silk ligatures already spoken of. The removal of the ligature was followed by a marked improvement in swallowing. For some weeks later deglutition was somewhat difficult, but it constantly improved, and at the present time swallowing is perfect and the patient restored to all her normal functions and a good state of health.

It was a mistake to have overlooked the possibility of the occurrence of scorbutus, and when artificial feeding is continued for so long a period the fruit acids should certainly be administered.

The patient was kept in a large single room in the hospital, but she was so depressed that we removed her to a ward with other patients and she immediately became more cheerful and her condition generally improved.

In looking over the literature on this subject some eleven tumors of a similar nature have been reported.

One took its origin from the epiglottis, another from the ary-epiglottic fold, another from the anterior part of the commissure a little left of the median line, another from the anterior part of the larynx below the vocal cords, another attached by a broad base to the anterior commissure and the anterior third of the right vocal cord, another occupied the whole left half of the larynx, the left ventricular band and the left ventricle, and nothing could be found of the left vocal cord, the growth extended out of the larynx into the left side of the neck and was partly intra-laryngeal and partly laryngeal.

One tumor was removed by a sub-hyoid pharyngotomy, but the patient died seven days after the operation with metastatic abscesses in both lungs. A lateral external operation was successfully performed in two cases. One case died by suffocation without an operation being attempted. In the other cases the tumors were removed by intralaryngeal operations.

The size and adhesions of the tumor I have presented demonstrate that it could only have been removed by a sub-hyoid pharyngotomy, and I believe a great part of our success was insured by the tracheotomy preceding the major operation.

Bibliography.

Professor Langenbeck. *Gazette hebdomadaire*. March 13, 1860.

Debrou. *Gazette des Hopitaux*. April 19, 1884.

H. L. Swain. *Trans. American Laryngol. Assoc.*, page 55. 1892.

D'Ambrosio. *Giornale Internationale delle Science Mediche*. 1892.

Alexander W. MacCoy. *New York Medical Journal*. Feb. 4, 1893.

Dr. Paul Koch, Luxemburg. *Wiener Klinische Rundschau*. 1897.

Prof. Paul Von Bruns. *Handbuch der Praktischen Chirurgie*. 1900, p. 104.

G. Finder. *Verhandl. der Charite. Gesellschaft*. Nov. 27, 1902.

De Santi. *London Laryngological Society*. May, 1903.

Teofil Zalewski (Lemberg). *Frankel's Archiv. f. Laryngologie*. 1904, Bd. xvi, s. 537.

Sir Felix Semon. *British Medical Journal*. Jan. 7, 1905.

DEMONSTRATION OF NEW INSTRUMENTS FOR BRONCHOSCOPY AND OESOPHAGOSCOPY.

BY PROF. GUSTAV KILLIAN, FREIBURG, GERMANY.

Prof. Killian spoke as follows:

Gentlemen: The instruments which I show you have recently been designed at my suggestion by my assistant, Dr. Brünings, and can be procured from Fischer, the instrument maker of Freiburg. I first show you five tubes of varying caliber, which are designed for use in adults and children. They have the advantage over the old tubes that they can be made longer or shorter. Through a long tube-spatula, which reaches down into the trachea, a second tube is introduced which can, by means of a spiral spring, be pushed forward as far as is necessary in the general cases coming under observation. In a similar way the second tube can be withdrawn at any time or be removed entirely. I have often commended the insertion of a narrow tube through a wider one and have employed the device with great advantage. Here you see the instruments which will explain the foregoing principles in a remarkably clear way. It can easily happen that after the introduction of a given tube in bronschoscopy or oesophagoscopy the latter may be found too short or too long. Formerly it was necessary to remove one tube and insert another, which objection can now be easily avoided.

The instruments for extraction also must vary in length according to the distance of the foreign body. It appears advantageous to have forceps which can be made longer or shorter. Brünings has solved this problem, as you see here, in a very simple way. The tubular forceps does not consist of one but of two thin tubes, one being inserted into the other. The inner tube can be easily protruded or withdrawn, and a simple device insures resistance against pressure as well as release. The inner tube has small indentations into which fit claw-like pro-

jections of the outer tube, acting as a check. The guide to which the forceps was attached in the old instruments is replaced in the new ones by a watchspring, to adapt itself to the different lengths of the instruments.

Moreover, I would like to show you a new electric handle which not only gives us an excellent light but which is also firmly attached to our bronchoscopic and oesophagoscopic tubes, permits the free introduction of instruments and an easy demonstration at all stages of the proceedings. The principle is the same as with Kirstein's lamp. We have a small electric lamp with crossed carbon filaments; in front, a condensing lens and in front of that a plane mirror with central perforation, inclined at an angle of 45 degrees. The mirror can be folded upward and revolves on two axes to insure an exact focus of the light. The whole lamp slides on the handle and can be placed directly in front of the tube or be regulated up to a distance of 12 cm. as required. The intensity of illumination varies very little. It is obvious that there is a special device for opening and closing the electric current.

When it is desired to use the handle, the current is turned on, the lamp given the requisite intensity of illumination to whiten the filaments, the lens is brought in front and the picture of the flame is thrown on the wall. By adjustment of the lens the size of the picture can be regulated. It shows a large bright cross. The bronchoscopic tube is then attached to the handle and the mirror regulated till the opening of the tube appears exactly in the middle of the cross of the light. The illumination thus obtained is excellent, as you can convince yourself at once by the demonstration. I hope that you will soon familiarize yourself with these new instruments, which in my opinion and experience greatly facilitate the bronchoscopic and oesophagoscopic technique.

Discussion.

Dr. Harris P. Mosher: Prof. Killian said that the nearer the bronchoscope can be placed to the foreign body the better. The same thing, it occurs to me, applies to the light. In the first German tubes the light was at the far end of the tube. Why was this given up? With a moderate experience on the

living and an extended experience on the cadaver the light at the far end of the tube, as in the endoscope after which the tube is modeled, has given much better results than the light at the near end of the tube.

The extension arrangement for the tubes and the extracting forceps is very beautiful mechanically. I noticed the other day as Prof. Killian was using this kind of a tube in New York that his suction tube was a separate tube which he introduced within the bronchoscope. This, of course, stopped the examination for a short time. With the solid tube which has the light carried down on one side and the suction tube carried down on the other, the mucus can be sucked out continuously without obstructing the view by the suction tube placed within the bronchoscope.

It is of great importance to know how many cases require an emergency tracheotomy after the manipulation of passing the tube through the cords in upper bronchoscopy. If we all could pass the tubes with as little trauma as Prof. Killian does there would seldom be any anxiety on this account. In our first attempts we are sure to cause a certain amount of trauma, and in proportion to the amount of trauma is the danger of an emergency tracheotomy within the next twenty-four hours. In this country this has been necessary. Have there been any cases of this kind in the German clinics?

Dr. E. Fletcher Ingals: I wish to ask how the forceps is taken apart for cleaning and drying.

Referring to what the last speaker said about the advantage of having the light at the end of the tube, I would state that in my practice, the light is sometimes better at the distal end, and sometimes at the proximal. I have in mind one case in which the light at the lower part of the tube caused a reflection that appeared like an extra ring. It came from the lower part of the tube. I have never obtained this reflection with the light at the proximal end. It caused a great deal of annoyance, and was probably the reason for failure in that case. The child had inhaled the head of a lead pencil—a small rim of brass with a short lead pencil in it. The appearance led me to think that the pencil had been removed, and that what I saw was the brass rim; and my assistants to whom I showed it were still more certain that this was the case. The pencil was there yet, however; but it was in the other bronchus. This reflection has deceived me other times, though this is the only case resulting in failure.

The light at the distal end does not always work well, no matter how bright it is. I should think that the use of Dr. Jackson's instrument would be attended by a good deal of

difficulty, as the blood or mucus collecting at the lower end of the tube blurs the lamp, which cannot be cleaned without removal. When it is reintroduced it is liable to be at once again blurred by the secretions which cannot be cleaned out without the removal of the bronchoscope itself. I have often used the light within the bronchoscope, but not inclosed in an extra tube.

As to the suction tube outside the bronchoscope proper, corresponding to the light tube on the opposite side, we want all the room that we can get inside, so that it appears to me objectionable and it would seem that this tube is another, liable to become blocked by thick mucus or blood. I have had my suction tubes blocked so that they had to be cleaned at once. They were tubes introduced within the bronchoscope. If they had been fastened to the outside as in Jackson's instrument, the whole bronchoscope would have to be removed. It seems to me better to use as large a bronchoscope as possible and to use light carriers or suctional tubes within it that can be easily moved. We can work better in a large tube, and the larger the tube, the better the lighting. With little children we cannot get a large tube into the larynx. With adults also, when working beyond the first or second division of the bronchi, one has to use a very small tube.

On the whole, I think Prof. Killian's instruments are as nearly perfect as they could be. The watchspring for the extension would not be in the way, but I want to know how it is cleaned and oiled.

Dr. Emil Mayer: I agree fully with the statements made by Dr. Ingals that there is an objection to the light at the lower end of the tube. Very frequently a small amount of blood will show itself on the mirror and one has to stop until the mirror has been cleaned off again; especially as we may not be able to see the foreign body as quickly as Prof. Killian could. The newer tube with watchspring, in making it less clumsy, is a great improvement upon the older one, in that the light is held in the hand. The head mirror becomes hot within a short time, and one has to stop and allow the instrument to cool off.

Reference has been made to the cadaver. To work with the cadaver is about as useless a method of practising bronchoscopy as I know of. It is far better to take a dog. This comes much nearer to the actual work and is easily done without annoyance to the animal. An injection of a grain of morphia makes it quiet; and the introduction of the instrument into the larynx, trachea, or bronchus becomes an easy matter indeed. One has then the same conditions that exist in the human being—the hot air blowing in the face, the mucus, and the blood.

The newer tube with watch spring, in making it less clumsy, is going to be a valuable addition to our armamentarium in this work. I feel that we owe a great debt to Prof. Killian for the advance in laryngology because of his work in this field.

Prof. Killian: Both the preceding speakers have answered the questions propounded by Dr. Mosher according to my own ideas. I have only to add that with narrow tubes, as are necessary with children, there is scarcely room for the attachment of a lamp on the distal end.

In 160 cases which I have collected from literature tracheotomy after bronchoscopy has been required only three times. In two instances the operation had been undertaken for the extraction of beans which had been in position for a long time, so that the beans were broken into several pieces, and the situation called for repeated introductions of the tube.

Personally I have never had in my many bronchoscopies for foreign bodies and for diagnostic purposes any evil consequences. Patients have been temporarily hoarse, but often only in a mild degree. I am very careful in introducing the tubes and strive to avoid any injury. Moreover we can so easily pass the tube spatula through the rima glottidis that injuries can under all circumstances be avoided. We must cocaineize the larynx sufficiently so that it stands open widely when the introduction of the tube takes place. Also one must never employ force. The laryngologist must without exception exercise a very light touch.

Dr. Mayer: What age is too young for direct bronchoscopy to be performed?

Prof. Killian: The youngest child upon whom the operation was performed at Munich was eight months old.

Candidate's Thesis.

THE CONSTRUCTION OF THE ETHMOID LABYRINTH.

BY GEORGE E. SHAMBAUGH, M.D.

(From the Hull Laboratory of Anatomy, the University of Chicago.)

Anatomically, as well as clinically, the ethmoid labyrinth occupies a central position in its relation to the other nasal accessory sinuses. Diseases of the frontal and maxillary sinuses are frequently combined with an involvement of the cells of the ethmoid. That this association is dependent on the close anatomical relations existing between the frontal sinus and the ethmoid labyrinth on the one hand and the maxillary sinus and the ethmoid labyrinth on the other hand, there can be little doubt.

The object of this paper is to call attention to certain fundamental facts in the construction of the ethmoid labyrinth, and to point out the close anatomical relations existing between the ethmoid labyrinth and the other nasal accessory sinuses.

The location of the ethmoid labyrinth is well shown in a cross-section as in Fig. 1. The labyrinth lies external to the meatus nasi communis and internal to the orbit and the antrum. Above is the floor of the anterior cranial fossa and below is the meatus nasi medius. The inferior and median walls of the labyrinth are marked by several conspicuous structures. These are, from below upward, the processus uncinatus, the bulla ethmoidalis, the concha media, the concha superior, and the concha suprema.

In a section made through the ethmoid the labyrinth is seen to be made up of a number of air spaces or cells, which vary

in size and are separated from each other by thin bony plates. These plates are formed with very little regularity. They have, however, certain relations in common. In the first place, all

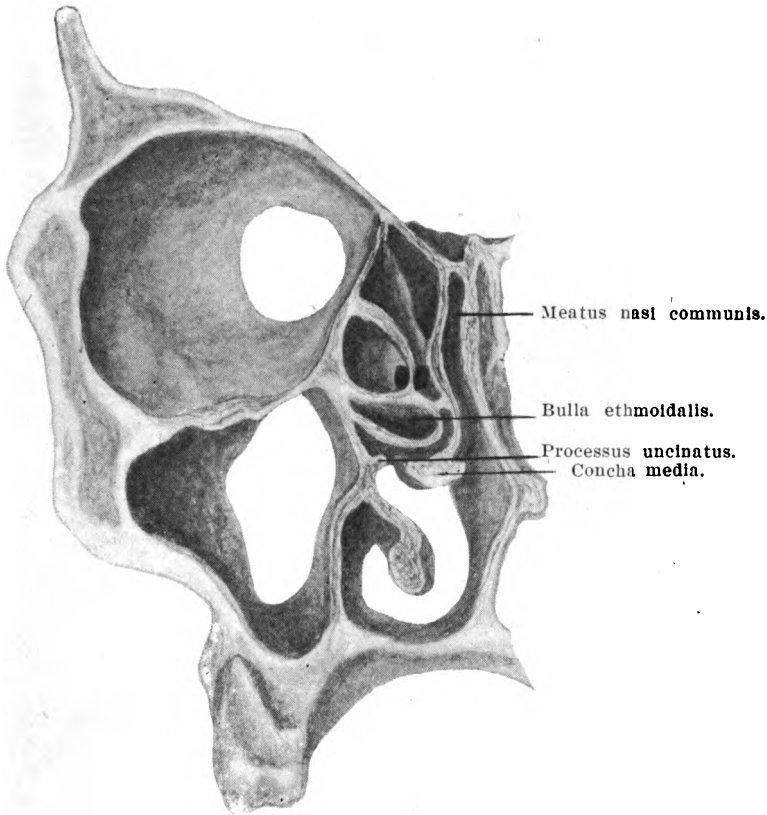


Fig. 1.

Frontal section showing right side of nose. Cross section through the ethmoid labyrinth.

the plates end abruptly as soon as either the orbital wall or the upper wall of the labyrinth is reached. See Figs. 1, 2, 3. This is not the case, however, on the median aspect of the ethmoid labyrinth. Here the plates do not end abruptly, but project beyond the labyrinth and form prominences which extend into the nasal chamber. See Fig. 2. The prominences

thus formed by the extension of the partition plates of the ethmoid labyrinth over in the nasal fossa are known respectively as the processus uncinatus, the bulla ethmoidalis, the concha media, the concha superior and the concha suprema.

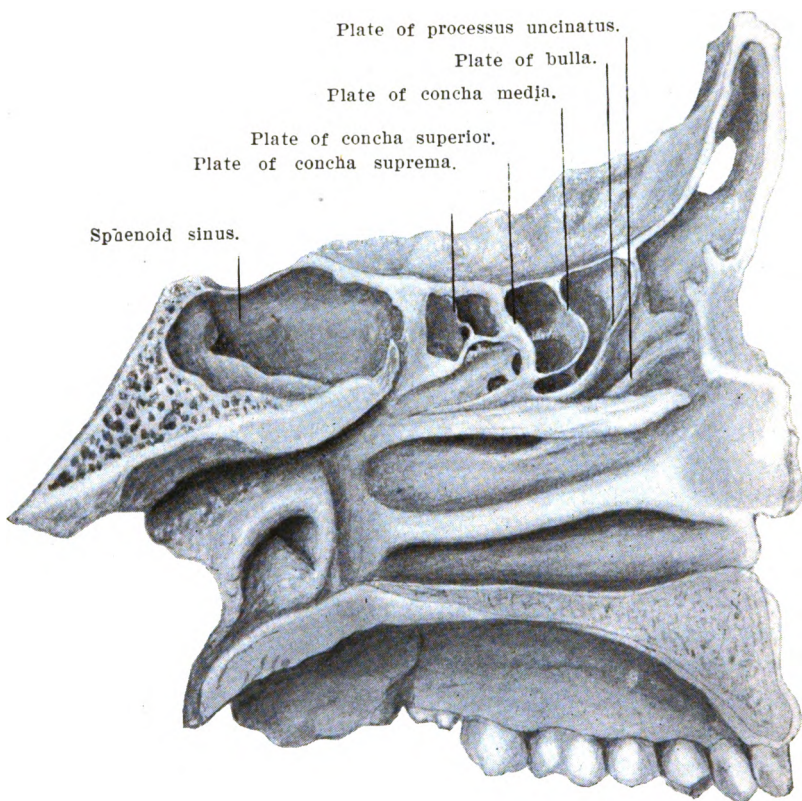


Fig. 2.

Sagittal section showing left side. Preparation shows typical construction of ethmoid labyrinth; the several partition plates presenting an unusually simple form.

The openings for the several ethmoid cells into the nasal chambers are always found between these prominences formed by the extension of the partition plates, that is, between the unciform and the bulla, between the bulla and the concha media and between the concha media and the concha superior. This

relation of the plates of the ethmoid labyrinth and the several openings of the ethmoid cells into the nasal chambers is well shown in Fig. 2. In this preparation an unusually simple, uncomplicated arrangement of the several ethmoid cells is found. Such preparations may be looked upon as representing the

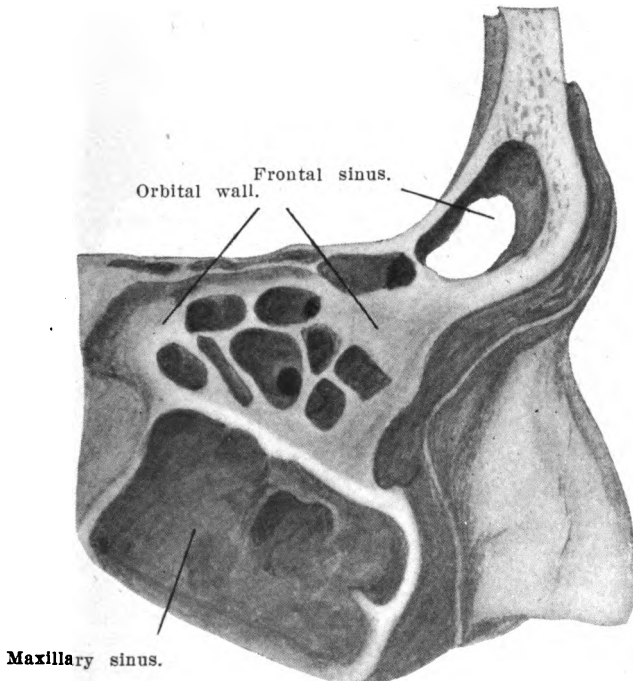


Fig. 3.

Sagittal section through the orbit section opening into the frontal sinus and maxillary sinus. The several ethmoid cells which impinge upon the paper plate of the ethmoid have been opened so as to show the relation between the cells and the orbit.

typical construction of the ethmoid labyrinth. The study of such a preparation will assist greatly to an understanding of what is sometimes referred to as the architecture of the ethmoid labyrinth. In the preparation shown in Fig. 2 the somewhat atrophic concha media has been partially detached. The concha superior is even smaller than usual, while the concha suprema is absent. The compartments or cells of the labyrinth have an

extremely simple arrangement, owing to the fact that the several partition plates extend through not only to the orbital wall but to the upper wall of the labyrinth as well. In this preparation, moreover, but a single instance is noted, where the several cells of the labyrinth communicate on account of imperfect separating plates. Usually a number of such defects in the separating

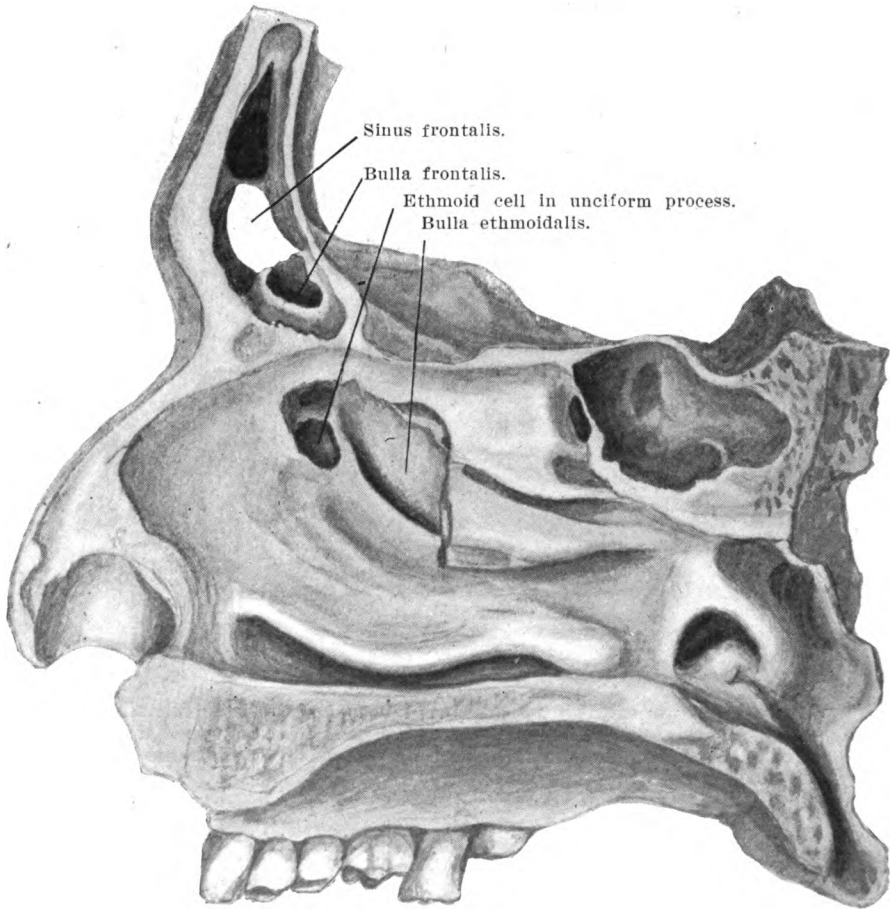


Fig. 4.

Sagittal section showing right side. The anterior half of middle turbinated body has been removed. The preparation shows a large ethmoid cell, which has been developed in the floor of the frontal sinus; also ethmoid cell in the unciform process.

plates exist and necessarily give to the labyrinth a much more complicated arrangement.

The lower or first plate of the ethmoid forms the processus uncinatus. This plate is always in a rudimentary state and only occasionally is it found forming the upper boundary of an

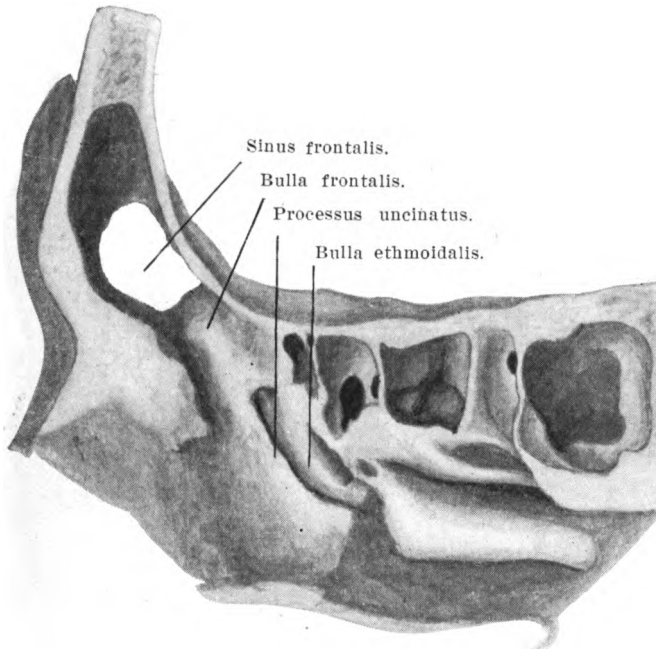


Fig 5.

Sagittal section showing right side; the anterior half of the middle turbinate body has been removed; the infundibulum, instead of opening into the frontal sinus, opens into an ethmoid cell, which has developed in the floor of the frontal sinus; the opening into the frontal sinus lies to the mesial side of the infundibulum.

ethmoid cell. When such a cell exists it forms a large agger nasi. See Fig. 4.

The second plate of the ethmoid is called the plate of the bulla because the extension of this plate into the nasal chamber forms the bulla ethmoidalis. Between the processus uncinatus below and the bulla ethmoidalis above is found a depression or trough. The mouth of this trough is called the hiatus semil-

unaris, whereas the depression or trough itself is known as the infundibulum ethmoidale. Into this infundibulum there are several openings. In its posterior end is the opening for the maxillary sinus. The anterior end of the infundibulum opens usually into the frontal sinus. Besides the openings for these two accessory sinuses, one or more ethmoid cells frequently

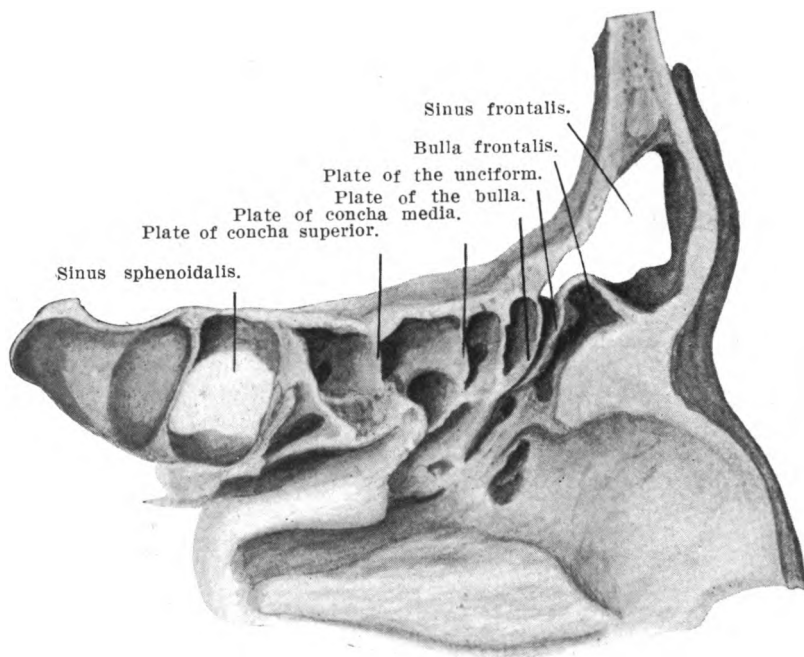


Fig. 6.

Sagittal section showing left side. The anterior half of the middle turbinated body has been removed and the ethmoid labyrinth has been opened up; the preparation shows an ethmoid cell which has developed below the unciform plate, pushing this up into the frontal sinus, where a bulla frontalis is formed; the other plates of the ethmoid are formed as usual.

open into the infundibulum. These cells are called the infundibular ethmoid cells. Such cells are usually located in the unciform process (see Fig. 4), or they are cells formed by a closure of the anterior end of the infundibulum which dilates in the floor of the frontal sinus into an ethmoid cell, as shown in Fig. 5.

The third partition plate of the ethmoid labyrinth is the plate of the concha media (see Fig. 2). Between the second and third ethmoid plates, that is, between the plate of the bulla and the plate of the concha media, is an opening usually quite large, leading into the ethmoid labyrinth. This is the opening

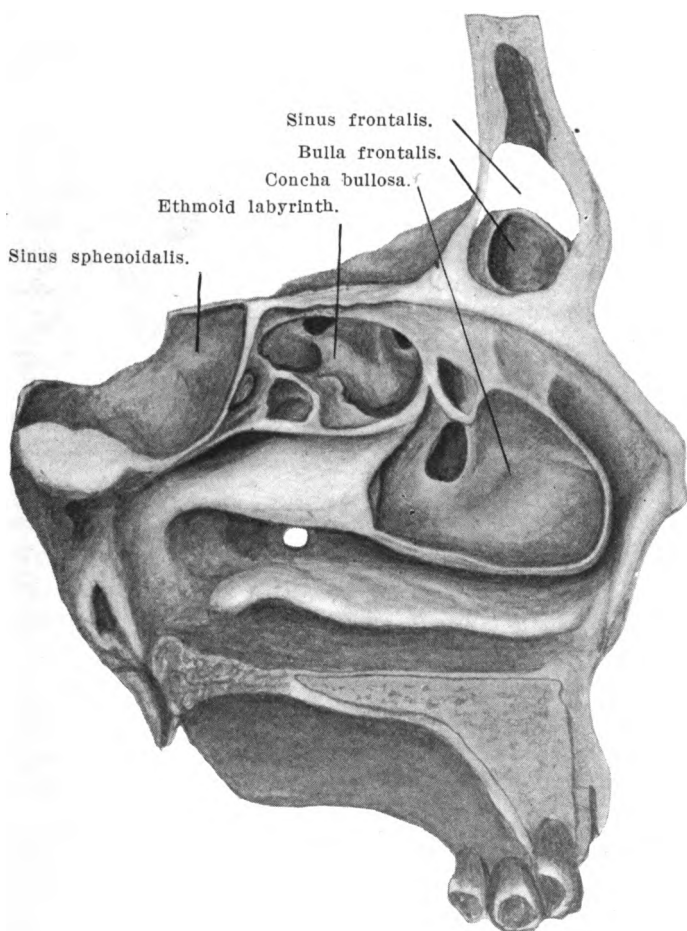


Fig. 7.

Sagittal section showing left side. The ethmoid labyrinth has been opened up; a large ethmoid cell is formed in the floor of the frontal sinus and an exceptionally large cell has developed in the anterior half of the concha media, forming the condition known as concha bullosa, also referred to as cystic enlargement of the middle turbinated body.

for the anterior, or, as they are sometimes called, the middle ethmoid cells.

The fourth partition plate is the plate of the concha superior. Between the extension of the third and fourth plates, that is, between the concha media and the concha superior, is the

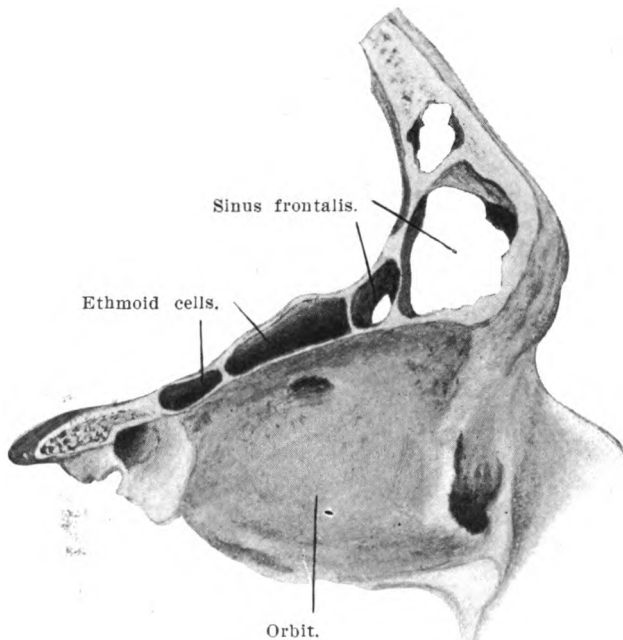


Fig. 8.

Frontal section through the right orbit, showing frontal sinus and ethmoid cells which have developed out over the orbit.

meatus nasi superior. Into this meatus there are usually several openings leading from the ethmoid labyrinth. These are the openings for the posterior series of ethmoid cells.

The fifth partition plate is the plate of the concha suprema, and like this structure, it is often entirely wanting. In the preparation shown in Fig. 2, the plate of the concha suprema is developed, although the extension of this plate, the concha suprema, is itself scarcely detectable. The plate in this prepara-

tion, however, is imperfectly formed, allowing free communication between the ethmoid cells on either side of it.

This arrangement of partition plates and openings for ethmoid cells represents what is understood as the typical or fundamental architecture of the ethmoid labyrinth. The great complexity in the construction of the ethmoid, which has given rise to the term labyrinth, is the result in the first place of extreme irregularity in the formation of the partition plates, and in the second place of the occurrence of defects in the several partition plates, allowing of communication between cells belonging to the different groups, that is, between cells of the anterior and posterior ethmoid series. This irregularity in the formation of the partition plates results at times in producing a large number of small cells, and at other times in producing extremely large ethmoid cells, so that occasionally the whole ethmoid labyrinth consists of but a couple of very large ethmoid cells. This same irregularity in the formation of the plates of the ethmoid results sometimes in carrying an ethmoid cell belonging to the anterior series, well back to the posterior end of the labyrinth. In this case the opening being found between the bulla and the concha media in the meatus nasi media, shows clearly that the cell must be classed as an anterior or middle ethmoid cell. On the other hand, a posterior ethmoid cell with its opening in the superior meatus, that is, between the concha media and the concha superior, is sometimes pushed so far forward as to produce a prominence in the floor of the frontal sinus.

Still another result of the irregular formation of the ethmoid labyrinth is the tendency for ethmoid cells to develop outside the usual confines of the labyrinth. Such anatomical variations are by no means uncommon, and when met with clinically or post mortem their true nature has often been misunderstood. For example, an ethmoid cell is sometimes pushed back into the sphenoid sinus where it occupies the upper part of this cavity. This has sometimes been wrongly interpreted as representing a double sphenoid sinus. More frequent is the invasion of the frontal sinus by an ethmoid cell. Here, too, the wrong interpretation has often been given that a double frontal sinus

exists. This is especially likely to be the interpretation when the ethmoid cell which has pushed into the frontal sinus is a large one.

An ethmoid cell which has developed at the expense of the frontal sinus is known as a bulla frontalis. It may have its origin in one of three ways: First, by an anomaly in the plate of the unciform process, by which an ethmoid cell, developing in front of the process, pushes this plate up into the frontal sinus, as shown in Fig. 6. Second, by the development of an ethmoid cell in the closed anterior end of the infundibulum, as shown in Fig. 5. This cell may expand in the floor of the frontal sinus and produce a bulla frontalis. The third way in which the bulla frontalis is known to form is when the plate of the bulla ethmoidalis is pushed forward into the frontal sinus. Examples of ethmoid cells which have invaded the frontal sinus are shown in Figs. 4, 5, 6, 7. These cells are found at times almost completely filling the frontal sinus.

The occurrence of an ethmoid cell in the anterior end of the concha media is quite common. Occasionally such a cell becomes very large, producing a cystic enlargement of the anterior end of the turbinated body. (See Fig 7.) This condition is known as a concha bullosa. That these cystic enlargements of the concha media represent but an enlarged ethmoid cell which has expanded in the turbinated body, has often been overlooked, and some rather interesting hypotheses have been advanced to explain their origin. Some have considered this condition to be the result of a "rarefying otitis." By others these cysts are supposed to be caused by a curling under of the free edge of concha media which in turn becomes attached along the base of the turbinated body in the middle meatus. The occasional large size of the cyst is then explained as the result of a dilatation of this cavity from its filling with mucus. Others have looked upon these cysts as ethmoid cells that have expanded and been pushed out into the turbinated body on account of the existence of a closed empyema of the ethmoid labyrinth.

The real nature of these cysts of the concha media is undoubtedly the same as of the ethmoid cells which invade the

frontal or the sphenoid sinuses. They represent an anatomical variation in the form of a large ethmoid cell growing out into the concha media. This cell, like any of the ethmoid cells, may occasionally become the seat of a mucocele or an empyema. The existence of the concha bullosa is not in any way the result of the mucocele or the empyema.

The cells of the ethmoid labyrinth are in close relation to the orbit. In the first place many of these cells are separated from the orbit merely by the thin orbital or paper plate of the ethmoid. This relation is shown in Fig. 3. Again it is not uncommon to find ethmoid cells which extend out along the upper wall of the orbit. These supraorbital cells of the ethmoid come necessarily into close relation with the orbital extension of the frontal sinus, the two being separated by a thin partition of bone. If a sagittal section be made in such a case, through the frontal sinus and the orbit, this plate separating the orbital ethmoid cells from the orbital extension of the frontal sinus will appear in cross section. (See Fig. 8.) Sections showing this condition have frequently been described as illustrating the existence of compartments in the orbital extension of the frontal sinus, whereas such compartments usually represent supraorbital ethmoid cells.

MESSAGE OF THE PHARYNX.

Exhibition of an Instrument Used for the Purpose by a
Famous Actor.

BY SAMUEL W. LANGMAID, M.D.

In the first of my laryngoscopic practice I found some difficulty in making satisfactory examinations on account of the intolerance of the pharynx to the introduction of the mirror, especially so when the examination was for the purpose of watching the action of the glottis in the act of singing.

I noticed that after repeated examinations the pharynx became, as it were, educated to the contact of the mirror and after a time instruments for the removal of growths from the larynx or for applying remedies were tolerated. Such was the experience of all laryngologists before the days of local anesthesia. It occurred to me that this education might be carried out by the patients themselves and I recommended massage of the interior of the throat by using the broad, rounded extremity of a toothbrush handle. By such massage the irritability of the pharynx was greatly diminished. A further result was the curative effect upon the enlarged follicles on the back wall of the pharynx and the reduction of hyperaemia of the whole buccal pharynx.

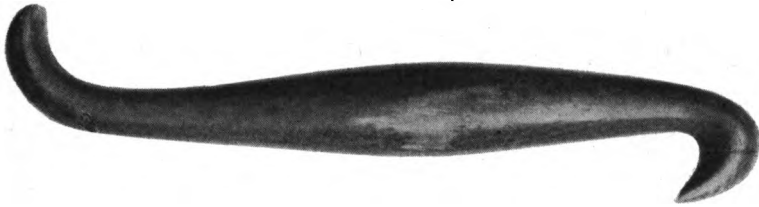
In after years I observed that the throats of most great singers and actors were markedly free from hyperaemia of the mucous membrane, and it seems to me that such a condition is essential to throats which have to bear the frequent stress of violent vocal efforts, whether in singing or declaiming. As a fact, the possessors of such throats rarely need treatment except during an attack of "cold" or for congestion of the larynx resulting from an over use of the voice.

With such experiences of the value of internal instrumental

massage of the throat, my surprise and gratification may be easily understood when I happened to witness the performance of such treatment by Mr. Edwin Forrest with an instrument of his own device.

I regret that the acute pneumonia, with accompanying mental derangement, from which he was suffering, prevented any attempt to obtain from him the reason for the practice of such massage, but the object may be vaguely revealed by his reply to my question as to what he was doing when I entered the room, viz., that he was "reaming out the told trumpet."

After Mr. Forrest's death, which occurred within the year, I obtained this instrument from one of his oldest and dearest friends, Mr. James Oakes, who assured me that he had often seen Mr. Forrest's use of it. I have thought that the instru-



ment, which I believe was his own invention, and its use in a way that I had previously recommended to my patients, was interesting in connection with Mr. Forrest's traditional vocal power and extravagant use of the voice.

Note.—After vainly seeking for evidence of instrumental or other form of massage of the interior of the throat by the Greeks or Romans, and for any record of such treatment in modern times, I have found since the above was written that a certain Admiral Henry, of the British Navy, who wrote* a century ago, more as an osteopathist than a massagist, recommended instrumental massage of the mouth and throat, not only as prophylactic but as curative treatment also for acute sore throat. He describes instruments for use in this way, none of them resembling the instrument of Mr. Forrest's device. but, he says, instruments can be made out of the handles of tooth brushes. Such is the difficulty of establishing a claim for priority!

*"The Anatriptic Art." Walter Johnson, M. D. London, 1866, Simpkin & Marshall Co.

Discussion.

Dr. J. Solis Cohen: I have heard with great interest the paper, and have seen with interest the instrument. In the early days of laryngoscopy, many of us had to use an instrument something like this to teach the patient to stand handling of the epiglottis. I used what the dentists call the extension-finger in order to accustom the patient to this, so that I might more readily make my applications, and attributed the improvement of the patients to the treatment instituted, and not to the instrument.

It would be interesting to have Dr. Langmaid tell us, in closing, how he uses his instrument for therapeutic purposes.

Dr. G. Hudson Makuen: I have always been under the impression that it is not so much the massage of the pharynx and throat that renders the patient tolerant to instrumentation, as it is the knowledge imparted to the patient by attempting to massage or manipulate the throat. If you can get the patient in possession of the right idea when his throat is being examined, you will have very little trouble; but patient's attitude is generally one of self protection rather than of co-operation. He is trying to keep from being hurt or from gagging, and he is not giving you intelligent assistance. If you can teach him to control his organs voluntarily, so that when you say "Relax the soft palate" he will promptly do so, you will have no trouble in examining the pharynx or the larynx. I have recently had the pleasure of examining the throat of a noted actress. She paid no attention to what I was doing, but turned her eyes up to the ceiling. I would say "Relax the throat" and she did it at once. This was not due to the fact that she had massaged her pharynx, but it was because she had the right idea of helping.

Dr. Clarence C. Rice: My experience coincides with that of Dr. Langmaid, namely, that noted singers and actors have become famous partly because they do not suffer in a large way from general catarrhal disturbances of the upper respiratory tract. In many instances the healthful condition of the nose and throat is due to intelligent treatment they have received at the hands of specialists in times gone by. But there is another aspect of this subject, and I can state it by saying that I have seen this winter a number of opera singers, nearly all Italians, suffering not only from chronic catarrhal conditions, but from catarrhal conditions which ought to have been controlled when these people were young. For example, a noted bass with a large amount of adenoid, a noted tenor with such thick lateral ridges as to prevent sufficient nasal

respiration, a soprano of great reputation with tremendous tonsils and long uvula. All of these people were very much opposed to even the most conservative operative measures. This was partly because these people were away from home, and were perhaps a little suspicious of American methods. All of these singers were in more or less bad voice constantly because of these chronic catarrhal conditions. My feeling has been that long continued vibration, incident to the strong use of the voice, tends to produce atrophy in the upper and middle pharynx, rather than congestion. When I find congestion in a singer's pharynx, when there is neither nasal nor post nasal catarrh, I suspect it is caused somewhat by the use of alcohol or tobacco. I have had little experience with internal massage of the pharynx in cases of singers, but external massage, properly employed, seems to me a useful therapeutic measure.

Dr. Langmaid: I am very much pleased that my paper has evoked any discussion or interest; because it was really only to show the instrument and to rescue it from oblivion that I wrote it, though I was willing to give some of my observations with it. I purposely did not mention anemia in my description of the throat; I said a lack of hyperemia. Dr. Makuen has now said that though he does not agree with me in other cases, in those in which there has been a wrong use of the voice he thinks that this swelling or hyperemia may occur. Dr. Rice has noticed in those observed by him that they had been nearly all winter in this condition. That is not the healthy condition which results from the proper use of the voice, long continued. Certainly it has been an observation of mine, and it seems philosophical, that the singer or actor who has had a successful career must have a throat free from hyperemia. Unfortunately, as Dr. Rice has implied, the hyperemia, the length of the uvula, and various pathological conditions may be owing to the abuse of food or alcohol; and we will include smoking.

When he spoke of Italians I agreed with him; for it is among these people that I have found the state he describes.

Dr. Makuen very properly and justly has spoken of the education of the throat in another way. I quite agree with him. I have no doubt that all of us have become more experienced than we were in the early years. A little spurt of cocaine, and we are all right so far as getting a view of the patent's throat is concerned.

I wish to emphasize the value of instrumental massage of the throat. It is in accordance with the observations in external massage. The vessels are reduced to a proper size by the flowing away of the excessive blood; and after this there is a tonic contraction of the tissues.

REMOVAL OF PAPILOMATA OF THE LARYNX BY DIRECT INSTRUMENTATION WITH THE AID OF KILLIAN'S TUBES.

BY CORNELIUS G. COAKLEY, M.D.

The difficulties encountered in the removal of neoplasms of the larynx in children, and occasionally in adults, are often so great that any method by which their extirpation may be accomplished may at times have to be resorted to.

About ten years ago Kirstein put forth his method of direct laryngoscopy, and, no doubt, many of you, as did I, attempted the procedure. I found it almost impossible to employ his method on my clinical patients, and after a few attempts, dismissed it from my mind. While visiting the clinic of Prof. Killian, of Freiburg, in the early summer of 1905, I was astonished to note the ease with which the tubes could be passed through the larynx into the trachea, and suggested to Dr. von Eicken, Prof. Killian's chief of clinic, the possibility of the employment of this method for the extirpation of laryngeal growths. At the same time, I went to Fischer, who makes the celebrated bronchoscopes of Prof. Killian, and had him construct for me an alligator forcep with a very long shank, with the idea of using it at some future time for the removal of papillomata of the larynx. On my return to Freiburg, the middle of August, Dr. von Eicken told me he had been considering the problem which I had presented to him, and showed me a bronchoscopic tube, with a large window cut in the side, which he thought would be of much assistance in the operation. The technique, as I understood it from Dr. von Eicken, was that the laryngeal spatula should be used, as for the introduction of the bronchoscope, and this specially constructed tube passed through the larynx and trachea far enough, so that the opening in the bronchoscope should come opposite the

neoplasm in the larynx. Pressure of the laryngeal tissues would force the growth into the lumen of the tube, and then by means of suitable forceps, the growth could be excised. I did not have time to have one of these tubes made for me. After returning home, I waited a full year before a suitable case came under my observation for treatment in this way.

In all my cases I have felt it necessary to administer a general anaesthetic. Some time may be saved by cocoainizing the pharynx and larynx before the administration of the anaesthetic. I have found the local anaesthesia of the larynx, in addition to the general anaesthesia, of considerable help in controlling the reflexes. If this is done, a much less degree of general narcosis is required.

The patient should be placed on the back, the shoulders brought to the edge of the table, and the head, properly supported by an assistant, allowed to hang over the end of the table. The operator should sit on a low stool, the height of which can be so adjusted that his eye is directly opposite the widely opened mouth when the head is hanging over the end of the table. His tongue should be grasped with the forceps and drawn out, thus raising the epiglottis, and facilitating the introduction of the spatula to a point beyond the tip of the epiglottis. If the tongue is now allowed to fall back into the mouth, it will be found much easier to pass the spatula directly into the supraglottic portion of the larynx, when a view of the vocal cords and any supraglottic neoplasm is easily obtained. Any supraglottic growth may then readily be removed by means of the straight forceps introduced through the spatula.

The illumination which I have employed in these cases has been the Kirstein headlight, as used by Killian.

If multiple neoplasms exist, I have found it difficult to remove every particle of the growth, owing to the obscuration of the field by blood and mucus, in spite of this having been wiped away with cotton.

If neoplasms are situated in the subglottic region of the larynx, the spatula must be introduced beyond the vocal cords, in order to get a proper view of their points of origin.

It is in this class of cases that the fenestrated tube of von Eicken promises to be of great assistance.

Case I. In October, 1906, ———, aged four years, was brought to the University Clinic, suffering from hoarseness and intense dyspnoea, the latter having increased considerably in the last three months. The child was too intractable to obtain a satisfactory view of the larynx, but from the clinical history, the diagnosis of probable papilloma was made. The child was placed in the usual posture, on its back, chloroform administered, and with the head hanging over the end of the table the Killian spatula was introduced into the larynx, and a papillomatous mass was seen in the anterior commissure. This was grasped with the above-mentioned forceps, and a piece of papilloma, the size of a large pea, was brought away. A second mass, more than half that size, was removed on the second application of the forceps. Bleeding was moderate, toward the end slightly obscuring the field, so that it was impossible to tell whether all the mass had been removed. On attempting to introduce the spatula, I noticed considerable swelling in the region of the arytenoids, and felt that it was unwise to persist any further with the instrumentation. The child recovered promptly from the anaesthetic, but was still quite dyspnoeic. Fearing lest such an oedema of the larynx might occur as to necessitate tracheotomy, the child was sent into the wards of Bellevue Hospital for observation, with instructions to perform immediate tracheotomy, in case the dyspnoea demanded it. Within two hours respiration became much more quiet, less labored, and the following morning the child was discharged from the hospital.

Case II. Within two weeks after this, Dr. Huey, of my college clinic, asked me to examine a child, aged four, suffering from the most intense dyspnoea—short of asphyxiation—that I have ever seen. I felt it unsafe to give the child an anaesthetic in the clinic, and advised the mother to take it to St. Vincent's Hospital and place it under the care of Dr. Stewart. Here, under chloroform anaesthesia, I attempted a direct examination of the larynx. A few whiffs of chloroform were administered, but the child breathed so badly that we were afraid to continue the anaesthetic. The tube spatula was introduced into the larynx, lifting up the epiglottis, but there was so much oedema and swelling of the right arytenoid, that it was impossible to obtain any satisfactory view of the interior of the larynx. Only the posterior half of the right vocal cord could be seen, and a large rounded red mass, different from anything I have ever seen before, occupied the right side of the larynx. Ten days later a second attempt was made to examine the larynx, and this was likewise a failure, owing to the swollen condition of the laryngeal tissue. Dr. Stewart then did a thyrotomy, and found

a large necrotic area, the size of a small hazelnut, which had involved the posterior half of the right vocal cord, involving the ventricular band and the arytenoid cartilage of that side. We both searched this region very carefully for the presence of any foreign body, but failed to detect any. Dr. Stewart thoroughly curetted the necrotic area, made an application of pure carbolic to the raw surface, and closed the thyrotomy wound. This patient made a good recovery, with fair return of the voice at the time she left the hospital, three weeks later.

Case III. Was that of a young girl, twelve years of age, who had been wearing a tracheotomy tube for two years for the relief of laryngeal stenosis from large multiple laryngeal papillomata. Considerable progress was made in the removal of these papillomatous masses by means of tube forceps, introduced through the mouth, but, owing to the wide distribution of the papillomata—some of which were subglottic—no substantial headway was made. The administration of chloroform through the tracheotomy tube, made the passage of the tube spatula exceedingly easy, and many pieces of papillomata were removed through the tube by direct manipulation. The greatest difficulty encountered in this case was the slight amount of oozing, which, in spite of the use of adrenalin and cocaine, made it impossible to distinguish between the papillomatous area in the larynx and the normal structures. A month later a second similar procedure was undertaken for the removal of newly grown papillomata.

Case IV. Was an adult, first seen in July, 1906, complaining of great hoarseness, and with an infiltration of the left vocal cord, occupying nearly the whole extent. The age of the patient, namely, 32 years, was rather against the supposition that we had to deal with a malignant growth. Although coughing considerably, there was no expectoration, and repeated examination of the chest failed to show any sign of tuberculosis. The patient was placed on large doses of potassium iodide, with some improvement for two or three weeks, after which time the growth increased with renewed activity. It was absolutely impossible, on account of the gagging, to obtain any of the growth (by the ordinary methods) for microscopical examination. I suggested the direct examination of the larynx, under chloroform anaesthesia, to which the patient consented, and in January of this year I removed a piece of the growth, about the size of a pea, and submitted it to the pathologist at the college for microscopical examination. His report was that it contained a good deal of newly-formed connective tissue, with many glands, but that there were no evidences of syphilis,

tuberculosis or malignancy. The growth increased so rapidly, however, that I felt sure it must be malignant, and advised an exploratory thyrotomy, and, should we find that my supposition was correct, a total laryngectomy as, during the last two months there had been beginning involvement of the right vocal cord. I understood that one of our surgeons in New York, under whose care this patient later came, did a thyrotomy and, finding the growth malignant, did a complete laryngectomy, with excellent results.

Case V. A child, aged three and a half years, came to the university clinic with a history of having been hoarse for two years, with gradually increasing dyspnoea. Examination of the larynx by mirror, revealed a pale, uneven mass in the anterior commissure. Under chloroform anaesthesia and direct examination the growth was removed.

Case VI. This patient came to the University Clinic, in the service of Dr. McCoy. The boy, aged four years, had been hoarse for two years, with gradually increasing dyspnoea. This dyspnoea at one time was so great that the mother took the child to the Willard Parker Hospital, where antitoxin was injected, and an intubation tube inserted for the relief of the breathing, but without any appreciable benefit. After remaining in the hospital for six weeks the child was discharged. Examination of the throat by mirror, revealed a papillomatous mass, filling the entire lumen of the larynx to the level of the upper third of the epiglottis. Under chloroform anaesthesia, direct inspection of the larynx was undertaken, when several papillomata were seen in the posterior portion of the larynx and removed. Dyspnoea was somewhat relieved, but inspection of the larynx a week later showed that the bulk of the mass was still present. A second attempt at removal was undertaken, but without any satisfactory results, on account of the intense dyspnoea and cyanosis which developed when the anaesthesia was administered. It was found that as soon as the tube spatula was inserted the larynx appeared nearly free from any growth. Evidently, the bulk of the papilloma was caught between the spatula and the anterior portion of the larynx, so that it was not visible in the lumen of the spatula.

Undoubtedly the fenestrated tube, as devised by Dr. von Eicken, will find a valuable place among the instruments employed for the removal of this type of papilloma.

Discussion.

Prof. Gustav Killian, Freiburg, Germany, the Guest of the Association: I am greatly pleased with the good results which

Dr. Coakley has achieved with the direct method in laryngeal papilloma. Soon after Kirstein demonstrated the direct method of laryngoscopy, Bruns, of Tübingen, reported some cases of laryngeal papilloma in children removed with the head dependent, under narcosis, by the aid of the spatula. Also Garel, of Lyons, and others reported like cases. I have had some personal experience also in this direction.

Narcosis must be deep. In addition it is necessary to thoroughly bathe the larynx with cocaine in order to abolish all reflexes. If the larynx contracts on introduction of the tube the view is lost and the operation cannot be continued. If the patient breathes quietly and deeply the larynx is widely opened and removal of the papilloma is easily accomplished.

In order to avoid the expulsion of the tube-spatula from the larynx during the operation and to overcome the difficulties occasionally arising from the occasional shutting up of the larynx, von Eicken has employed a tube with a lateral opening. This tube reaches down into the trachea. It is then turned so that the papilloma projects through the opening, and is then easily removed. Recently my second assistant, Brünings, has constructed a spatula which has a very long beak reaching into the trachea. This beak is bent outward laterally so that the examiner has a very wide field for observation.

In my experience one obtains the best view of the larynx if he introduces the tube-spatula between the epiglottis and the base of the tongue. I employ for that purpose a modification with the bifurcated end.

Formerly, and especially from the standpoint of the surgeon, laryngotomy for laryngeal papilloma was very frequently done in little children in whom removal was impossible by endolaryngeal methods. In my judgment direct laryngoscopy renders such a surgical procedure unnecessary. We can in all cases, with the aid of the tube-spatula under narcosis, remove papillomata and the operation can be repeated as often as seems necessary. We all know the tendency of papillomata of the larynx in young children to recur. In time past surgeons have not hesitated to repeat laryngotomy several times. The injury to the larynx and the permanent impairment of the voice are well known. A somewhat different condition obtains with tracheotomy. When children are brought to us in suffocative attacks we are compelled to perform tracheotomy before we free by the direct method the larynx from its papillomata. In such a case an attempt could be made to slowly introduce the tube between the papillomata into the trachea and then by proceeding slowly upward to remove enough of the papillomata to afford free space for breathing. It is self-evident that such

a procedure should not be undertaken without every preparation being made for immediate tracheotomy, if the latter should become a sudden necessity.

It is perplexing when papillomata come back so easily; and one is compelled to operate again and again. Often one gets the impression that the operation must be renewed in an increasingly radical degree. Accordingly I commend for this purpose, after thorough cleaning out of the larynx, internal remedies. Long ago Dundas Grant and others employed arsenic for this purpose. We know that this remedy is advantageous in papillomatous processes on the outer skin. In one instance I have seen laryngeal papillomata permanently disappear under the employment of arsenic, and recently in the *Monatsschrift f. Ohrenheilkunde* four cases from Koerner's Clinic were reported by Koellreutter.

In addition to arsenic, iodide of potash has also been used with benefit. This remedy is also of service in the flat epithelial growths in the larynx, which we call pachydermia. By continuing this remedy for months I succeeded in the case of a child who suffered from laryngeal papillomata, in securing a permanent recovery with complete restoration of the singing voice.

It is also the fact that papillomata may after a while disappear spontaneously. I observed such a case some years ago. The patient was a child of eight years whose larynx was filled with papillomata. The mother was not willing that an operation should be done. Four years later the patient again came to me with a perfectly healthy larynx. Dr. Coakley's case No. 4 appears to be a similar instance. This patient still had, when she passed out from under Dr. Coakley's observation, some growths in the larynx, but three months later these had almost entirely disappeared, although there had been no intervening treatment.

I shall shortly collect my results and in the meanwhile I commend to you in your future cases to free the larynx from papillomata by direct observation and also to give arsenic. If the latter is not of service the iodide of potash should be given for a period of months.

Dr. E. Fletcher Ingals: In 1905 I saw a little fellow three years of age, with a papilloma of the larynx. In this case I made the diagnosis with a spatula like the one shown by Prof. Killian. I did not operate until the spring of 1906. In that year I operated upon three children by the direct method. I first tried the spatula shown by Killian, but I got along better with one with a pointed end. I had some trouble with contraction of the larynx, because I did not use cocaine, being afraid

to employ it. I removed the papillary growth completely in all three cases; but it recurred in two, and one of these has it still. Two patients are now cured. In one case, in which I did the operation without tracheotomy, I cleaned out the larynx perfectly, as I believed, for I had a good view of it; but a few minutes later the larynx began to close, and I was obliged to do a quick tracheotomy to save the child's life, for I had no intubation-tube at hand. In both the other cases tracheotomy was done, and I have come to the conclusion that it is best in all of this kind of cases in young children, although Dr. Coakley's experience has demonstrated that it is not always absolutely necessary. One of these children is now wearing a tracheotomy-tube, with a papilloma completely filling the upper portion of the larynx. I have already removed the growth three times in this case, and have concluded to wait several months before doing it again. Some one (I cannot remember who) says that papillomata often disappear in young children; so in this case I am waiting to see what will happen.

In one case I used a preparation of iodine and sulphur, supposed to have some influence in removing these growths or in preventing their occurrence, but it did not prevent the return of the growth. In another instance I used iodine and carbolic acid, in quite a strong solution, but am not sure whether it did good or not.

Dr. J. Payson Clark: Two years ago I had the pleasure of reporting before the society a number of cases of papilloma of the larynx in children. My conclusion was that in such operations in children a preliminary tracheotomy is best in all cases; because I found that on removing a papilloma it was of very frequent occurrence that the growth recurred with greater rapidity and often over a new surface in the larynx. In other words, the operative interference seemed to stimulate the growth, and the larynx would be more filled up than ever. I do not feel it safe to operate on these children without performing a previous tracheotomy; so that is the method that I have followed in all cases since, with very good results.

Four of the cases that I reported two years ago were then still wearing tracheotomy-tubes. In three of these cases the tubes have been removed, and the patients are perfectly well. The other case I have not seen lately.

In removing the growths, I have used the direct method with the Kirstein autoscope. I have also employed the tube-spatula. The latter instrument does offer advantages in certain cases in which the autoscope is not satisfactory because the epiglottis gets in the way and interferes with the view.

I should like to ask Dr. Coakley whether there has been any

recurrence in either of the cases he spoke of. I should be much surprised if there were not.

Another point is that when a previous tracheotomy is performed the larynx has perfect rest. In that condition, the growth is much more likely to atrophy than when the child is using the larynx to breathe through.

Dr. Emil Mayer: As a contribution to the use of the Killian tubes, my own experience is that the head-light becomes intolerably hot within a very short space of time; so much so that work has to be discontinued to allow it to cool. The latest addition that Prof. Killian has made to the tube appeals to me, as the handle has the light attached. I trust that the professor has his tubes with him, that the association may have the advantage of seeing the newer tube, which aids in the examination of the trachea, bronchi, and larynx very much more than with the former method.

My own experience tallies with that of the other speakers, that attempts to remove the growth from the larynx alone are likely to be followed in children by recurrences.

Dr. Henry L. Swain: I have taken great interest in this paper of Dr. Coakley, and in the discussion that Dr. Killian has given us, because I think that this field is one in which we have been at a loss how to accomplish the best results. As Dr. Clark demonstrated in his paper, read a couple of years ago, our best method of treating papilloma up to the present time in young children has been to perform tracheotomy, and keep the tube in until the growth has shrunk as the result of the cessation of activity in the larynx. Papillomata in the larynx are not different from warts in other situations. If we pick a wart on our hand until it bleeds it will spread. It is the same with instrumental interference with papillomata of the larynx; it often causes an appearance of the growth in another situation. We have to steer clear of two dangers: that of not doing enough and that of doing too much. I believe that it would often be good policy to put in the preliminary tracheotomy-tube and let the larynx rest until the great congestion, or part of it at least, has disappeared, and then operate to remove the growth. I have a child now under my care. A year ago she came with a papilloma. I put in a tracheotomy-tube, and the wearing of this has made the growth shrink. I have meanwhile been trying to acquire skill in the use of the Killian instruments. The growth being in a quiescent state, I think I can now get rid of it without danger of recurrence if I am skilful enough in the use of the instruments to remove it without wounding the tissues greatly. It is a vastly different thing to operate by direct laryngoscopy from performing a thyrotomy.

We have all had the growth return by external operation, and have had to do the operation over again or leave the tube in permanently. Hence if we can save our patients from so grave a procedure we certainly ought to spare no pains to do so.

I am a novice with the Killian method which I have been using only two or three months, yet it is surprising how much I can do without general anesthesia. It pays to take time, using plenty of adrenalin and cocaine even in the anesthesia cases. In this way, a great deal of time will be saved. There will not be as much bleeding, and one will be able to cauterize with any substance which one sees fit to use. Clear carbolic acid has served well in one case, although it is too early to report the result in that instance. From the standpoint of a novice I can but emphasize what the other gentlemen have brought to your attention, that by the direct method you can accomplish a great deal, and I think we ought to use it more frequently.

Dr. William Lincoln: I agree very heartily with what has been said as to the extreme troublesomeness of these papillomata of the larynx. A method like this ought to be welcomed by all. What we should do is to help along in perfecting these instruments and this technique. After all, there will never be a time when the distinguishing marks of papilloma of the larynx will not be an extreme susceptibility to irritation and to growth as the result of irritation in the larynx by any instrumentation. That we probably shall never overcome, yet I think that this direct method is a great deal less objectionable on that account.

I have recently had under my care a case of marked papilloma of the larynx. It has not distinguishing features, but is nevertheless, a very instructive case. The child had a tube inserted nearly three years ago. It had been operated on repeatedly, with the usual result of continued and more rapid re-growth. The larynx was then put at rest and there was a cessation in the rapidity of the growth, and a shrinkage took place. Other means were tried, but the growth remained about the same. Finally, there was a marked growth about the opening of the tube in the trachea. A large papilloma was found in that place. The child being difficult to manage, it was suggested that the x-ray should be tried. This was done, with immediate and gratifying results. The tumor, which was very large (about the size of a large marble), disappeared within three or four weeks. This result encouraged me to advise the regular use of the light through the body of the larynx, which has been carried out for four or five months, twice a week. The growth has shown a very encouraging tendency to decrease. Whether

it will entirely disappear, I am not certain. I am inclined to think that, as is usual in such cases, it will diminish to a certain extent and then stop.

Dr. William E. Casselberry: I feel that the external operation, thyrotomy, for papilloma of the larynx in young children should not be thus summarily condemned in favor of the direct straight tubal method of access to the larynx. A limited experience in removing papillomata from the larynx by means of the direct tube-spatula has convinced me that this procedure is not always easily accomplished. I have encountered difficulties such as uncontrollable tongue, retching, excess of mucus and blood, which even under general anesthesia, supplemented by the use of cocaine, interfered with keeping the tube where one could secure good illumination. For children it is an advance over the old attempts at intra-laryngeal operating with the aid of a mirror, hence it should be developed to the utmost; but there is still a legitimate place for thyrotomy. All the speakers concede that recurrence, and hence repetitions of operating—and, of course, of general anesthesia—remain the rule with the new as under the old mirror method. Many patients and their parents cannot afford the time, money and detention from business required; hence it is quite proper, even at a slightly increased risk, to seek by the operation of thyrotomy to provide a quicker and more reliable remedy. While an immediate and permanent cure of papilloma of the larynx in children cannot be assured by any method, still it stands to reason that in thyrotomy the more complete view and the readier access to the sites of the papillomata afford a better opportunity for thorough extirpation at a single operation than does either the direct or indirect intra-laryngeal method. Even if necessary to repeat it once or twice, it still has the advantage over the many repetitions of other methods for the class of patients specified.

Dr. A. Coolidge, Jr.: My experience has been largely with Dr. Clark, and my conclusions agree with his. Cases of papilloma may be divided into two groups: those occurring in children and those in adults. Each class presents a different problem. I have never seen a case in an adult not easily kept down by intra-laryngeal methods, and in many cases the direct method is the preferable one. In children, the problem is different. Up to the time of the introduction of Prof. Killian's tubes, the conclusion that I had reached was that the best treatment is to do a tracheotomy and leave the tube in until the growth shows no sign of recurring, or the patient has become old and trained enough to allow intra-laryngeal methods to be successfully used. If the tube is taken out too soon,

and there is a recurrence, a second tracheotomy must be done, which is worse than if the tube had been left in for years.

The question of removing the growth after the tracheotomy tube has been put in must depend upon circumstances; but it is never advisable to treat roughly a papilloma which has a tendency to recur. In children papilloma can be removed from the larynx better with Killian's tubes than with any other instrument. I do not know to what extent the use of the straight spatula in children is going to make it possible to do away with tracheotomy. Dr. Ingals thinks it better to do it, even if the direct method is used. It seems to me that in some cases we may get rid of the necessity for doing a previous tracheotomy by acquiring better technique and a better knowledge of Professor Killian's method.

Dr. Samuel W. Langmaid: I happen to have brought with me something that illustrates what Dr. Coakley and the other gentlemen have said. I had intended to exhibit it as a pathological specimen, but if I may be allowed to illustrate what has been said by this, I shall do so.

I agree with Dr. Coolidge that we must distinguish, in treating papilloma, between the cases of adults and of children, and with Dr. Casselberry, especially when he says that circumstances modify cases—the circumstances of the age of the patient, his temperament, our own convenience, etc.

The specimen I herewith present illustrates several points; in the first place, the recrudescence of the growth. It is impossible that all that could have existed originally. I had the pleasure of showing the case to Dr. D. Crosby Greene, Jr., of Boston, in its earlier condition.

The patient, a man between twenty and thirty years of age, came to me with a large papilloma on the tracheal side of the epiglottis, and with the larynx pretty well filled up. I examined him for quite a number of days, and found that the growth was increasing. I began to operate with the ordinary forceps; but the tumor increased faster than I could get it out. At last it occurred to me that for the destruction of condylomata of the generative organs a mixture of alum and savin powder is especially useful. I used this, and the growth seemed to halt. I have been three years in getting it out. It has been done at my convenience and with very little expense to the patient, and the result is perfect. He has come, perhaps, every fortnight or every month. Then I used another remedy in the intervals. He was to spray his larynx thoroughly during these periods, four or five times a day, with a strong alumnal solution. I cannot help thinking that both these remedies were better than anything else I know of. At last—I think it was in

December—but one growth remained, which was about in the middle of the right cord. That I took out, and there has been no return.

In speaking of circumstances, it should be said that this man never had dyspnea, except on rapidly going up stairs—why, I do not know. When I got down to the cords I found that the right did not make the excursion that it should. The cough was very little, and there was no dyspnea. Had there been dyspnea, this protracted method would have been quite wrong. Larger growths of this variety have been shown to this society, but this is large enough to answer the purpose of illustration.

I wish to endorse Dr. Clark's paper, which pleased me very much. My first belief in the value of that method of treatment was founded upon two cases, one being quite interesting, in which, after I had done a tracheotomy in the child, who was then five years old, every papilloma had dropped off at the end of five years. The tracheotomy tube was removed and a plastic operation done to cover the opening left by its removal. The patient eventually became a fine singer.

Dr. D. Bryson Delavan: In studying this subject we are impressed with two important facts: first, the inveterate tendency of these growths in children to recur; second, the serious results of the long-continued wearing of the tracheotomy tube and its effects upon the larynx and upon the upper part of the trachea. The treatment of a case should not be undertaken without a full understanding of the first proposition. No plan of treatment has yet been suggested by which all papillomata can be topically treated with success, and recurrence absolutely prevented. Such attempts have been made, and with mild cases have often succeeded. I have described a method, and so have others, whereby the local application of certain medicaments to the larynx has cured papillomata. In many cases, however, it is impossible to obtain such a result by this means. We have, therefore, to resort to operation. Having the probability of recurrence in view, the mechanical method chosen should be selected with great care. Dr. John Rogers, of New Yorks, has pointed out the conditions that arise from the long-continued wearing of the tracheal cannula. He has shown that various deformities are caused by it, and that these deformities are extremely difficult to treat. The various strictures that take place in localities that the tube presses upon are very difficult to overcome. It is certainly most gratifying that removal of these growths without tracheotomy can in some cases now be accomplished. The first case of this kind that I remember in this country was described by Dr. Franklin H. Hooper, a number of years ago. In this case he removed a large growth

completely by the endolaryngeal route, under general anesthesia. It is gratifying that we have given to us so admirable a means as that described by Professor Killian, which marks a great advance in the local methods of dealing with these conditions. Under no circumstances should a case be considered as cured until a long time has elapsed, in which the patient has been kept under observation to prove the final disappearance of the growth.

Dr. Thomas Hubbard: I hope that Dr. Coakley, in closing the discussion, will express his opinions as to the post-operative treatment of cases of papillomata of the larynx. I do not think he spoke of this at any great length. I have recently examined a case operated on six years ago, in which I had used a fenestrated tube made after the model of the O'Dwyer intubation tubes, but not by the direct method. With this instrument I could see the growth distinctly. I removed it with the forceps and the curette, and followed by trichloroacetic acid. The growth, which occupied the anterior third of the larynx, was examined in the pathological department of the Manhattan Hospital, and was reported to be probably malignant. In many years that have since elapsed, this growth has not recurred and the patient has a perfect voice. Examination a few days ago, however, showed a small papilloma about the middle of the left vocal cord. This is probably not a recurrence of the original mass.

Dr. Joseph H. Bryan: I want to ask about the strength of the cocaine used in these cases and whether serious results have followed its employment.

Dr. John M. Ingersoll: I have under my care at present a little girl with papilloma of the larynx. There were originally three distinct masses; two in the larynx and one subglottic. She wore a tracheotomy tube for over a year without any apparent benefit upon the growths. The use of the x-ray daily was then begun and the growths began to disappear. I operated recently by the direct method with Killian's tubes and removed the greater part of the two growths in the larynx. The x-ray treatment was continued daily and it seems to overcome the tendency of these growths to recur. I expect to operate upon the subglottic growth soon.

Dr. Coakley: I thank the gentlemen very cordially for their very kind expressions regarding my paper. It was written with the desire to recommend this method to the attention of our fellows. I believe that it will be found of great value in many cases. It will not cure every case. Recurrences will follow this as they do in other methods of treatment. The first case, operated on in October, showed a subsequent slight recurrence.

There had been a small part of the growth left and this has increased, but not rapidly, as one would expect. Some papillomata grow more rapidly than others, after any form of treatment. My other cases are too recent to tell whether there will be a recurrence or not. In none of them did I feel that I had removed all the growth. I could not get all out, because toward the end of an operation small pieces are obscured by the slight amount of bleeding that occurs, and one cannot differentiate between these little pieces of papillomata and the healthy mucous membrane. The procedure is safer than any other method of instrumentation in children, and one can do more at one sitting through the introduction of these tubes than by any of the older methods of indirect illumination with a mirror. One can do more and with a great deal more safety to the patient. With the other method it has occasionally happened that I have taken away some of the healthy mucous membrane or part of the cord and other men have had the same accidents. Some of the parts not meant to be removed were caught in the forceps and removed. This danger is entirely done away with by this method. The parts are quiet, and the only trouble is one cannot be sure at the close of the operation that one has removed all the growth.

I believe that many so-called cases of recurrence in children are cases in which new papillomatous areas occur. This happened in Case No. 4. New areas would crop up in the larynx, in spite of everything I did. During the last few days an area developed which grew very rapidly, and I did not know how big it would have become before the voyage across the water was completed. I felt chagrined to think that Professor Killian would find there a large papilloma. The growth was merely the size of a pea when the patient left, and nothing had been done for three weeks previously.

In cases of papillomata in children, we are dealing with a process that will frequently recur, and I do not consider any of the patients as cured unless they remain free from recurrence for several months.

I think that Professor Killian put the right emphasis on the discussion when he said, "If we see the cases early enough." I believe that it is going to be possible in most of the cases to avoid the deformity of an external operation. Well-to-do people would do anything to avoid having a thyrotomy or a tracheotomy performed upon any of their daughters. I think that tracheotomy, by giving rest to the larynx, is an aid in causing the disappearance of the growths, but it is a question whether the parents of such children would desire to have them tracheotomized with the disfigurement caused by it. A

tracheotomy-tube worn for years is apt to leave some stricture of the trachea. There is bound to be some thickening, though it may not be enough to give much trouble. It is, however, to be considered. If you see these cases early enough, before the entire larynx is filled so that the dyspnea is great, this method should be the one of choice.

On the other hand, if the growths are large, one should not give an anesthetic without having a tracheotomy-tube handy and being ready to do an immediate tracheotomy, because the tissues are relaxed and the growth often seems to fall down and fill the glottis, so that it is a dangerous procedure unless one is prepared to do a tracheotomy at any instant.

A ten per cent solution of cocaine will be sufficient, if one waits long enough for it to act. My idea in applying the cocaine before the administration of the anesthetic is in the saving of time during which the patient is anesthetized. The weaker solution will then give as much result as would a twenty per cent. or a saturated solution. I have been asked whether I am not afraid to give cocaine in connection with chloroform. I have given it a number of times without bad results. In two of the cases, as I finished my work, I took a cotton applicator, dipped it in pure carbolic acid and touched the bases of these masses. I do not know that this did any particular good, because in Case 4, that of the young lady who went abroad afterwards, the growths returned over some of these areas. I should not use it unless the patient had had a tracheotomy, for I should be afraid it might produce such an edema of the larynx as to necessitate the performance of a tracheotomy. The advantage of this method of operation is that one may in some cases save the patients the necessity of a tracheotomy.

A CASE OF SPASM OF THE OESOPHAGUS.

BY JOHN W. FARLOW, M.D.

Mrs. A., 50 years of age, has been the subject of several severe attacks of spasm of the oesophagus, occurring at irregular intervals, without apparent exciting cause. Her health has always been perfect. She is not in the least nervous, hysterical, anaemic, or dyspeptic; on the contrary, good, vigorous health has always been her good fortune.

Her father, always strong and well, who lived to be 75 years of age, and his equally strong brother, who died at 80, were both subject to attacks of apparent spasm of the oesophagus, at intervals of several weeks or months, during a period of many years. The attacks of the father and uncle practically always came on at the beginning of a meal, with the swallowing of the first mouthfuls of food—soup, for example. The patient would have a distressed look on his face, place his hand to his neck, thus indicating the seat of his trouble. At times this spasm lasted several minutes, then gradually yielded, and the patient could continue his meal, a sense of soreness in the lower part of the throat remaining. Occasionally the patient would be obliged to leave the table, and the spasm would yield with the act of vomiting.

I was unable to learn that any particular article of food could be accused of bringing on these seizures. As regards the local conditions in the throat, I found nothing but a certain amount of chronic pharyngitis. Late in life these attacks occasionally appeared, but were rather less severe. They were always considered a personal peculiarity, and, as there were no symptoms between the attacks, and as they did not increase in frequency or severity, no treatment was used.

Mrs. A. had had a few slight attacks of discomfort in the throat when eating raw apples, nuts or dry bread, in which she

was obliged to stop eating for a few minutes on account of apparent closure, or a feeling of constriction, in the upper part of the oesophagus. About four years ago, in the middle of luncheon, while eating a piece of raw apple, she became pale, looked distressed, put her hand to her throat and was evidently in great suffering, the pain being in the lower part of the neck, but not extending to the back or arms. She was able to speak, and the pulse and respiration were not affected; she loosened the neck of her dress and went to the opened window; she was unable to swallow anything, even water. Hot applications to the neck seemed agreeable, but did not cause the spasm to relax. After lasting about twenty minutes, the pain stopped, some frothy mucus, which had collected in the throat, was expectorated and the spasm was finished. Examination of the throat later showed a slight chronic pharyngitis and a moderate enlargement of the lingual tonsil.

There was not other attack for over a year, when, in the midst of perfect health, a similar spasm occurred while eating a piece of meat at luncheon. The pain and distress were much as before and diminished in twenty minutes, but began again in a few minutes, this time the pain being referred to a region lower down, nearer the cardia. Again there was a year's interval; when one afternoon, while eating biscuit, the same train of symptoms appeared, this time lasting three-quarters of an hour.

Beginning a few days later massage of the neck was given for several weeks. Cold compresses were used and local treatment for the slight trouble in the throat. Since then, about a year, there has been no trouble, but treatment may not have had much influence.

What is the nature of these attacks, and how are they to be differentiated? A young person in perfect health, while eating, has a sudden distress in the neck. The first thing to be thought of is the possibility of a lodgment of food in the larynx, which would cause dyspnoea, perhaps complete loss of breath or voice, a condition which could last but a very short time. The voice would also be affected. In my patient the voice was normal and the character of the food was not

such as to fill up the glottis and there was no glottic closure. A large piece of food could be caught in the oesophagus and be held tightly by a resulting spasm, and the symptoms would be like those of my patient, except that the spasm would probably not be followed immediately by perfect ability to swallow food down into the stomach.

Angina pectoris would cause great dyspnoea, pain in the chest and radiating down the left arm, and there would be changes in the pulse and respiration. The previous history gave no evidence of a stricture or obstruction, and the absence of regurgitation of food and inability to swallow at times threw out the possibility of there being a diverticulum.

Oesophagismus, or acute spasm of the oesophagus, occurs not infrequently in nervous or hysterical subjects, but spasms of such severity and duration in a person in perfect health and without a local exciting cause are unique in my experience. The earlier and minor attacks seemed to be in the upper part of the oesophagus, while the distress in the severer seizures was apparently lower down, judging from the patient's statements and gestures.

How to relieve the spasm was a difficult matter. The patient was unwilling to allow the use of ether or anything that would cause unconsciousness. A subcutaneous injection of morphine might suffice, but as it requires from five to twenty minutes she seemed hopeful that the spasm would soon relax and was very loath to have me use the opiate. As she could not swallow, and as there was much mucus and saliva in the mouth, I did not think that cocaine or any local anaesthetic would be of service. The external, hot applications had but little effect. Another physician who was called in and arrived at the end of the spasm, which had lasted three-quarters of an hour, suggested the use of a tablet containing emetine, to be dissolved in the mouth with the hope that enough would be quickly absorbed to cause a letting up of the contraction. He thought it would be well for her to carry some of these tablets with her to take in case an attack came on when she was alone. I have had no experience with the drug, and a little experimenting might have to be done in order to find out what sized dose

would be necessary to bring about the desired effect. Perhaps a subcutaneous injection of one-sixteenth grain of apomorphia might suffice, but as it requires from five to twenty minutes to act, it might not really shorten the attack. An article by Dr. Hamilton Osgood, in the Boston Medical and Surgical Journal, April 25, 1889, entitled "A Peculiar Form of Œsophagismus," discusses at some length the symptoms and nature of some of these cases, but nothing very satisfactory as regards relief of the spasm is given.

Discussion.

Dr. Henry L. Swain: I have never seen a case of spasm of the œsophagus just like the one reported. I was much interested to learn what sort of case Dr. Farlow was to relate to us because on Thursday last, a patient came in during my office hour and said that he had been unable to swallow for eighteen hours. Not even a bit of moisture could possibly be forced down his throat. The latter was not sore. During the last three years he had occasionally had attacks of the same kind, lasting about ten or fifteen minutes. Two weeks before he had had one lasting an hour, during which time he had fainted, and some doctor, whose name he does not know, had been called in and had passed an œsophageal bougie. This had relieved his spasm.

This patient gave a distinct point of issue of the spasms. It was situated upon the left side of the throat. There would be a painful sensation and resulting from that was something like a cramp in the throat. From then until the throat relaxed he would be unable to swallow anything. At his visit to me he made an attempt to swallow water, but regurgitated it with intense spasms. All the muscles drew up as in stiff neck. I attempted to look down into the œsophagus with great pleasure. Mindful of the fact that he had said that there was something on the left side, I cocaineized the left sinus pyriformis. I passed the œsophagoscope, swabbing with cocaine as I went slowly along, until I struck a point that he said was the place, just below the level of the cricoid. Then the spasm seemed to let up, and as I took my instrument out to let the cocaine work, he said, "I can swallow." I handed him a glass of water and he swallowed it with composure.

I then tried to find an œsophageal lesion; and passing the œsophagoscope down again, I discovered a round swelling on the left hand side, just below the cricoid cartilage — about

twenty-five cm. down from the teeth, as marked on the tubes. The convex surface was somewhat eroded. The patient was not a good subject for examination, and, not being very skilful, I did not get a good view. I, however, put on a simple five per cent. nitrate of silver solution, and expected to see him again before coming away, but evidently he was able to swallow from then on, as he has not shown up.

Inquiry as to his habits, in order to get a more definite idea of the pathological conditions, developed nothing. He was an inordinate drinker of indifferent whiskey. There was no glandular swelling or enlargement of any kind.

He said that constantly during the last year he had had such difficulty in his throat. During the time the spasm is on absolutely nothing can pass down. He apparently has the same sensation in his œsophagus as he would have if the cramp were in any other muscle. I hope some time later, perhaps, to extend this report.

Dr. William E. Casselberry: I regret that Dr. Farlow did not make a trial of cocaine, even though the œsophagus was in such a rigid state that there was no hope for it to pass through the constricted point, because I recall, in this connection, not a spasm of the œsophagus, but a case of spastic dysphonia in which spasm of the vocal adductor muscles greatly impaired speech, but in which a cocaine spray applied to the nose would enable the patient to speak plainly for an hour. Although able to reach locally only parts in the immediate vicinity of a point of spasm, cocaine seems to lessen reflex irritability, either in this way or by its systemic absorption from the mucosa. Of course, it might not have been effective in Dr. Farlow's case, but it would seem to have been worth a trial. I recall a case of spasmodic constriction of the œsophagus, but of less intensity than the one described by the essayist. An elderly gentleman complained of inability to swallow properly at certain times. Naturally, one thought of possible carcinoma of the œsophagus, but this patient had given a history extending over six years, without aggravation of the condition. Sometimes he would not be inconvenienced for two or three months and then the constriction would occur spasmodically for two or three weeks at a time. At these periods, on attempting to swallow special articles of food—acids, for instance—he would suffer a constriction of the œsophagus which he located at the upper part, and would not be able to proceed with his meal but would choke and need to rise from the table. Attempts at passing œsophageal bougies of various sorts without anesthesia failed. Every time the attempt was made the œsophagus, in the region of the cricoid or below,

would undergo constriction. He was then anesthetized, ether being given to the point of surgical anesthesia, when, somewhat to my surprise, bougies of any caliber, large or small, were found to pass with the utmost ease. There was no point of organic constriction. I used Einhorn's œsophagoscope without trouble, securing a good view, but observed nothing abnormal. This was about eighteen months ago, and he has since remained the same. Being assured that it was not malignant, he deemed treatment unnecessary.

Dr. Lewis A. Coffin: These cases would seem to be instances of disordered reflexes and I presume that we have all had spasms of the oesophagus with certain stimuli or with irritation at the proper point. There seems to be some change in the peripheral endings of the sensory nerves.

This recalls an interesting case that occurred in my practice several years ago. A boy twelve years of age had never been able to swallow anything solid, and his family could not take him to ordinary hotel tables, etc., as they felt ashamed to have him sit down in public and eat only Mellin's Food and milk. I was asked to see him. I could not form an opinion as to the cause of the spasms which caused all solids to be ejected, but I did know that the child had adenoids. I knew he would be better off without these, whether their removal should have any influence on his deglutition or not. They were removed, and the next day he could swallow all right. He has had no trouble since. I believe the trouble to have been due to some disorder of the nerve ends. I should think that cocaine would be just the thing to relieve this condition—temporarily, at least.

Dr. E. Fletcher Ingals: I now have under observation, and have had for some weeks, a case similar to that reported by Dr. Farlow. The patient is a lady about forty years of age, not hysterical, presenting nothing wrong in her appearance—excepting that she seemed anaemic. She has had spasms of the oesophagus, much like Dr. Farlow's patient, for a number of months. While she has been under my care there has been a gradual improvement under the use of tonics and bromides, in much the same way that I have heretofore used these remedies for spasms of the oesophagus and pharynx. I did not get satisfactory results until I began introducing oesophageal bougies—pretty large ones. Each time this treatment gave decided relief, and I would find her better at her next visit. I think that this method of treatment will effect a cure in her case. At one of the treatments I used cocaine before passing the bougie, to relieve the patient's discomfort. I had previously passed the bougies without the cocaine. Afterward the patient preferred the treatment without cocaine, as she did not like

its after effects. I think there would be no difficulty in passing an œsophageal swab with cocaine on it, to relieve the patient's discomfort at the time, but as the spasms are usually relieved after a few minutes, I do not think it worth while.

Professor Gustav Killian: According to my experience, spasm of the œsophagus may be either primary or secondary. We observe secondary spasms in lesions of the stomach. Treatment is of value only as we treat the accompanying gastric lesion.

Primary spasm I have observed very frequently in persons who have bad teeth, eat too quickly and do not sufficiently chew their food. The quick swallowing of food not sufficiently triturated, irritates in time the gullet up to a point of spastic contraction. The injury is very obstinate and difficult to treat. If treatment is to be of any avail care must be taken by the patient to eat slowly and his teeth must be placed in good condition.

In order to form a judgment as to how thoroughly food is triturated under normal and under abnormal conditions, I have had constructed a basin (Kaubecken) containing five sieves. The upper one has wide and the lower one small openings. The bolus about to be swallowed is placed on the upper sieve, and water is then rinsed throughout the entire system of sieves. In this way the fragments of food arrange themselves on the different sieves according to their size. In this way it is easy to ascertain whether or not the patient chews his food sufficiently. I am intending to shortly publish an article on this subject.

Dr. A. W. de Roaldes: I would call the attention of the Society to the fact that some of these cases of spasm of the œsophagus may be secondary to some disease of the nervous system, especially tabes. This fact should not be overlooked. In the tabetic condition of certain patients that have come under my observation, I have noticed in some cases the frequency of spasms. These occur not only in the advanced stage of the disease, in which spasms—sometimes of a tonic character, like ordinary cramps—are frequently noticed, but also in the early stages. I remember a case in which the patient had suffered for nearly two years with spasm of this kind, but clonic in character. This was not diagnosticated in the beginning as to its origin, but was simply treated and unrelieved. Two years afterward the case was reported in Europe as having developed tabes. The spasm continued for many years, and finally the patient died a tabetic. I should, therefore, like to call your attention to these spasms, because they may constitute a prodromic condition of a case of tabes.

Dr. G. Hudson Makuen: I am inclined to think that many

of these cases like those described by the reader of the paper are analogous to the condition referred to by Dr. Casselberry as dysphonia spastica, and that there is a nervous, or psychical, element in them. The patients cannot swallow, because they think they cannot, or fear they cannot, and they always do better—whether in swallowing, in vocalization or in the use of speech—when under some form of mental exhilaration. This may explain why Dr. Coffin's patient did better during the dinner he gave him. These dysphonia spastica cases will always do better during periods of exhilaration. I think, perhaps, that this will explain largely the effect of cocaine. I believe that it is more the systematic effect of the cocaine that produces the good effect in such cases than its local effect. The patients are in a state of mental excitement. The normal man will talk more and better under the effects of cocaine.

I also wonder whether this condition may not be similar to the condition one sometimes finds in slight paralysis of the pharyngeal muscles. I now have under my care a little fellow who has great difficulty in swallowing, due to unilateral paralysis of the pharyngeal muscles. If the paralysis were bilateral, it would be rather difficult to diagnose it; but as it is unilateral the palate is pulled to one side, and I can see the true cartilage, and sometimes of the cricothyroid membrane. At times he has to throw his head to one side and twist his neck in order to get the bolus down. The patient improves under electrical treatment of the pharyngeal muscles.

Dr. Farlow: As regards cocaine, we should not use it when a spasm is first coming on, because it is possible that the spasm may be but momentary. If, however, it has persisted for fifteen or twenty minutes the mouth would be full of saliva, and I do not think that in these conditions the cocaine would act. My patient is in great distress during these spasms, and I should be loath to pass anything with an irritating substance on it, or an instrument of any size, down the oesophagus of a person gasping for breath.

Dr. Makuen: Would the distress take place if the bolus she attempts to swallow was in a fluid condition?

Dr. Farlow: There is nothing more fluid than clear soup.

Dr. Makuen: I do not understand the physiology of the phenomenon. I should think that the soup would be regurgitated.

MODERN PROCEDURES IN EXCISION OF INTRINSIC MALIGNANT GROWTHS OF THE LARYNX.

BY J. SOLIS-COHEN, M.D.

Modern procedures exclude all attempts at intra-laryngeal extirpation of intrinsic malignant growths of the larynx as virtually futile, except under fortuitous conditions not to be expected. Hence, direct access from the exterior is to be practised in consonance with general surgical principles.

This procedure comprises a central division of the thyroid cartilage, and sometimes of the cricothyroid membrane, cricoid cartilage, or even of the trachea, as may be requisite to fully expose the morbid mass and its immediate surroundings when the wings of the thyroid cartilage are separated with retractors, or with stout loop ligatures.

This may be done under either local or general anesthesia, and with or without precedent tracheotomy; the choice being dependent in great measure on the location and apparent extent of the neoplasm, and in part on the predilections of the operator.

For many years the writer's preference was for prophylactic tracheotomy several days in advance of the main procedure, in order that the patient might become accustomed to the presence of a cannula, the retention of which was supposed to be requisite for some time after the operation. This opinion, however, has been proven erroneous. Prophylactic tracheotomy is not requisite at all, except where strong indication exists for precautional use of a tube after operation.

The operative and post-operative technic has become so simplified of late that the tracheotomy safety tube may be permanently withdrawn in most instances when the operation has been completed. Nevertheless, a properly prepared cannula should be at hand for prompt introduction should contingencies arise requiring it. In such instances as seem to demand retention of

a cannula, a fresh one should replace the tube used during the operation.

Forty years ago the writer reported *the extirpation under ether of a fibroid growth from the interior of the larynx under access by thyrotomy without any tracheotomy whatever; and on the seventh day the patient, a journeyman shoemaker, was working at his last, having been able to sit up within less than twenty-four hours after the operation, and to have taken a walk in the street upon the fourth day. In this case, as in most of the few other cases upon which the writer has operated, the growth was removed with forceps and scissors, and no stitch whatever was taken in the thyroid cartilage or in its perichondrium.

The immediate technic of operating most in vogue at present is to begin under chloroform inhalatory anesthesia with an incision through the skin from hyoid bone to some distance down upon the trachea. Then a tracheotomy is performed and a tampon cannula inserted. The thyroid cartilage is then thoroughly exposed and divided in the median line with bistoury, saw, scissors or cutting pliers. The wings of the thyroid are separated with retractors, or with strong ligatures; cocaine solution is applied to the interior of the larynx to control reflex movements which otherwise are often very embarrassing during the dissection, and adrenalin solution is subsequently applied to contract the blood vessels and lessen the immediate hemorrhage of the excision, while at the same time it facilitates definition of the growth. Under careful retraction of the sides of the larynx, with the best available illumination, whether natural or artificial, the entire diseased tissues are exposed to vision, and removed with a surrounding zone of healthy tissue sufficient to secure the patient immunity from immediate recurrence *in situ*.

The writer continues to prefer his own method, which is to begin with an ordinary tracheotomy in the first place, if the patient is not wearing a cannula already, and, after introduction of the cannula, to incise the skin only so far as to uncover the larynx; thus leaving intact a broad bridge of skin above the

*N. Y. Medical Record, 1867, p. 218.

cannula. This lessens considerably the dimension of the external wound and favors reunion in the sequence. Should due exposure of the morbid parts require it, this bridge can be cut into or be sacrificed entirely, but in the majority of cases it can be spared.

Tracheotomy having been performed, a tampon cannula is to be introduced to occlude the upper portion of the trachea; preferably Hahn's sponge covered cannula kept in an aseptic solution during the early steps of the operation so as to moisten the sponge. According to conditions, some little time, usually ten to twelve minutes, will have to elapse before the sponge becomes swollen sufficiently to fulfil its purpose and occlude the trachea from the entrance of blood. This time is utilized in exposing the thyroid cartilage and getting it ready for division.

Hemorrhage having been controlled, the thyroid cartilage is divided in the middle line with strong, obliquely bent short cutting pliers, the lower blade being first thrust through the cricothyroid membrane and passed up to the incisure. In young people a stout bistoury will suffice. The wings of the cartilage are then held asunder with retractors, firmly but gently, and if the exposure be insufficient for careful manipulation the cricothyroid ligament and, if necessary, the cricoid cartilage may be divided to afford the required access to the parts. These parts being duly exposed, the interior surface of the larynx is freely mopped with a solution of cocaine until the reflex movements are under control, and then the morbid mass and half an inch or more of surface around it should be mopped with a solution of adrenalin to diminish hemorrhage and define the growth. When saliva and mucus flow too rapidly in the larynx for control with mopping by an assistant, a tampon secured to a ligature for easy withdrawal can be pressed into the lower part of the pharynx so as to occlude it and absorb the secretions. In the few instances operated upon by myself this tamponing has not been necessary.

Bleeding and secretions being under control, the excision can be begun. The usual method is to surround the parts to be removed with an elliptic or oval incision down to the perichondrium, and so excise the mass with scissors or bistoury as to remove it together with the underlying mucous membrane, and

then carefully scrape the perichondrium and apply an escharotic. My own preference at present is, when practicable, to strip the inner perichondrium from the wing of the thyroid cartilage under the entire surface of the parts to be removed, raise the mass intact and sever it with serrated scissors at a distance, as far as may be, of about half an inch from the growth, which itself is left untouched by any instrument, so that it is removed in one piece, a miniature mass of flesh upon a fleshy plate. If the growth be located in the anterior or central portions of the half of the larynx, the denudation of the internal perichondrium can be begun from in front with an elevator, or a dull-pointed dry dissector, such as Allis's, which is then worked underneath until the whole of the portion to be severed has been raised from the cartilage. In cases where the growth is too far removed from the line of the thyrotomy incision, the elliptic incision to surround the growth may be made so as to extend through the perichondrium to the cartilage, and the perichondrium can then be attacked at the most accessible point, first with a sharp elevator and then with the blunt dissector.

After the removal of the morbid mass and the drying of the parts, the raw surface is thoroughly mopped with compound tincture of benzoin, and the wings of the thyroid are allowed to reapproximate. The tampon cannula is now withdrawn from the trachea, and if breathing be comfortable no attempt is made to introduce another cannula unless contingencies arise for it in the after treatment.

Should the adjustment of the wings of the thyroid cartilage be accurate there will be no necessity for taking stitches in the cartilage or in the external perichondrium to keep them in place. The natural resiliency will suffice, for cough occasions less disturbance than is theoretically surmised. Should the wings of the cartilage override, however, it will be necessary to insert sutures to keep them in correct apposition.

In my own practice no stitches are taken in the skin wound. Instead, a longitudinal strip of perforated plaster is placed along each side of the neck an inch or so from the line of incision, and then this plaster is sutured in several places through the perforations, along the line of thyrotomic incision, and tied only so tight as to bring the severed edges of skin into gentle appo-

sition, and leave the wound free for easy and immediate inspection. No threads are passed over the line of the tracheal incision, which is left bare to favor expulsion of matters from the air passages. A pad of gauze moistened in bichloride solution is then placed upon the wounds, while a broad strip of aseptic gauze is doubled over a narrow strip of adhesive plaster and secured to the neck, so that the gauze hangs down like an apron over the dressing upon the seat of the wounds. In this manner there is no strain upon the skin from stretching of sutures, and the parts are readily accessible to inspection and manipulation.

The bed of the patient should have the foot portion raised so as to insure the flow of secretions toward the mouth and away from the air passages, and be so maintained as long as necessary. The patient should be placed near the edge of the bed, lying upon the side of operation, and without a pillow under the head. When thirsty, an attempt may be made to draw sterilized water up into the mouth from a bent tube inserted at its lower edge. This will sometimes be practicable within a few hours, and then suitable nourishment can be administered in the same way until cicatrizations are sufficiently advanced to allow the use of more solid food. Should this plan be impracticable, nourishment should be administered by the bowel for a short time, or until deglutition becomes safe.

The post-operative treatment is as important as the operative procedure, and therefore the operator, or a sufficiently skilled assistant, should be within immediate call at least during the first twenty-four hours to combat any adverse conditions which may arise, although it will often be the case that nothing untoward does occur. But when anything untoward does occur the presence of some one able to meet the emergency may be a matter of vital importance. Should it become necessary for any reason to reintroduce a cannula into the trachea, which has to be maintained for several hours or longer, some method of moistening the atmosphere near the head of the bed should be provided if necessary, so as to prevent the secretions from desiccating, and a piece of moistened gauze can be kept over the orifice of the cannula. The external parts are treated on general surgical antiseptic principles, and although cicatrization by granulation is to be more or less expected, a large extent

of the external wounds often heals by first intention, sometimes covering the entire thyrotomic portion, thanks to the absence of constricting strictures even in the upper part of the cutaneous wound, and to the bridge of tissue preserved between the incisions for tracheotomy and for thyrotomy.

Under favorable conditions the patient should be able to sit up in three or four days, and to be practically recovered from the operative procedures in from two to six weeks.

In the description of this method it will be observed that much has been learned from the experience of Mr. Butlin and Sir Felix Semon as reported during recent years; especially the preference of preliminary to prophylactic tracheotomy, the use of the loop of ligature in spreading aside the wings of the thyroid when the retractors are insufficient, and the removal of the tracheotomy cannula immediately after the extirpation of the growth and attention to the wound of excision.

The retention of the skin bridge between the incisions for tracheotomy and for thyrotomy, the removal of the growth in mass upon a plate of excised perichondrium and superjacent tissue, the dressing with compound tincture of benzoin, the avoidance of sutures in the cartilage and in the skin, and the special method of loosely approximating the edges of the incisions together are the chief points of variance from usual methods in the practice of the writer.

NON-RECURRENT CARCINOMA OF THE LARYNX REMOVED THROUGH THE NATURAL PASSAGES.

BY E. FLETCHER INGALS, M.D.

The results of treatment in carcinoma of the larynx are generally so bad that it is a pleasure to be able to report a case in which there has been no recurrence of the growth for over a year after its removal by endolaryngeal methods, even though nothing in the operation or treatment of the case can be presented as of special interest.

The patient, K. P., was a laborer, forty-four years of age, who came to me on the 2d of January, 1906, complaining of marked hoarseness which had lasted for six years. There had been no pain until within the previous three weeks, during which time he had suffered some pain in the region of the left half of the hyoid bone. He was not conscious of having taken any cold, but stated that he had had catarrhal symptoms for some time, and that the nasal cavities had often been obstructed, although at the time of his visit they were better. His general health was good. There was no dyspnoea, the appetite and digestive organs were normal. He stated that the hoarseness had been variable, sometimes having been so bad that he could talk only in a whisper; at other times his voice was much stronger, but continually hoarse. There was nothing in the hereditary history to account for the condition, and there was no evidence whatever of lues. The patient's habits were good; he had formerly smoked tobacco, but had given it up three weeks before he called upon me, and he had never been accustomed to inhaling the smoke. He stated that his usual weight was 165, and he weighed 163½ at the time of his first visit. The temperature was normal, pulse 68, regular and normal. There were hoarseness and a slight hacking cough, but no dyspnoea. Upon inspection I found the nasal cavities about half closed by swelling of the turbinated bodies, but this gave him no inconvenience. There were no thoracic symptoms. Inspection of the larynx showed a pinkish gray tumor involving the anterior 5-6 of the left vocal cord, filling the opening of the ventricle and extending inward so as to considerably obstruct the glottis, and crowding outward into the ventricular band.

This was about 15 mm. long by 8 mm. wide and apparently about 6 mm. in thickness. Some blackish areas on the surface were apparently caused by coal soot. The growth had the appearance of malignancy, but it had been present so long that I hoped it might be a simple papilloma. I removed the greater part of it at the first sitting and submitted it to Professor E. R. LeCount, of Rush Medical College, for examination. After the operation I directed the patient to keep an ice pack on the neck for twenty-four hours. He returned two days later, and at that time I was able to see the greater part of the left cord perfectly, but a small part of the growth, about 6 mm. in diameter, remained at the front end of the cord and a piece something smaller at the back end. At this time I removed all remnants of the growth from the back end of the cord and about half of that from the front end, but could not secure all of it because of the bleeding. The patient returned two days later, as which time he complained of considerable soreness of the larynx; therefore I merely applied a mild solution of zinc sulphate. A similar application was made at the next visit, two days later. I did not see him again for a week. In the meantime I had received a report from Professor LeCount that the neoplasm was a slowly growing carcinoma, with growth toward the surface and considerable keratohyalin transformation of the epithelial cells. At this time I found a growth at the anterior end of the left cord larger than at the last visit, which I removed thoroughly with a special Mackenzie forcep. After removing this I found there was a growth of about the same size just below the vocal cord. This I also removed with Mackenzie forceps. I again advised the cold applications to the throat. When he returned four days later he was very hoarse. There was about 15 per cent congestion of the left cord and about 5 per cent of the right. Some roughness of the edge of the left cord, which had been noticed at a previous visit, had disappeared, and no remnants of the growth could be discovered. A mild astringent application was again made. When I again saw him eleven days later the left cord was still swollen and the congestion of both cords was a little more pronounced than it had been at the previous visit. I gave him a small inhaler charged with 5 grains of iodine and 20 grains of menthol, which he was directed to use five or six times a day. This he continued for several months. Two weeks later there had been no reappearance of the growth, but the congestion in the larynx was still more than when I had last seen him. He stated that he had just suffered an attack of influenza, which probably accounted for the increased inflammation. I directed the inhalation to be continued and made a mild astringent application to

the larynx. I saw him again in a little over three weeks, at which time the congestion had considerably diminished. Three weeks later the voice was noted to have been clearer and the patient stated that he was at his regular work daily. I did not see him again for a little over two months, at which time it was noted that the voice was continually growing clearer, and he stated that he could sing, something that he had not been able to do before for many years. The cords, however, were still congested about 8 per cent, and both of them were slightly thickened. There was no return of the growth. I did not see him again until January 28, 1907, over a year after the operation. He had been on the Pacific coast for several months, and stated that for the last three or four months his throat had been perfectly well. His voice, he said, was as good as it ever had been. I found no evidence of return of the growth. In response to a letter he called again on the 14th of February, at which time he stated that the voice continued as good as ever. I found, however, there was slight thickening of the vocal cords and congestion of about 15 per cent, apparently due to a recent cold; however, there was no evidence of any return of the growth. Although interference with malignant laryngeal tumors is likely to stimulate their growth, it appears to me that when there is doubt of the pathology, and conditions are such that we have a hope of removing the neoplasm thoroughly by the endolaryngeal method, this operation should be chosen. If microscopic examination reveals malignancy and the tumor speedily returns, laryngotomy or laryngectomy should be at once advised if there is reason to believe that a thorough removal can be effected.

REPORT OF A CASE OF EPITHELIOMA OF THE
LARYNX; REMOVAL BY THYROTOMY; NO
RECURRENCE AFTER THREE AND
ONE-HALF YEARS.

BY HENRY L. SWAIN, M.D.

Believing as I do that every case of radical operation for cancer of the larynx with its results should be reported and recorded in some accessible volume, I hereby present the simple clinical history of an interesting case. Inasmuch as it is a favorable report, I have waited until a sufficient time has elapsed to insure no return before bringing it to your attention. The tendency in recent years is to lengthen the period of complete immunity before placing a given case in the "completely cured" list. Instances have been reported where recurrences have taken place after two years of apparent freedom, and very frequently after one year. In waiting three and one-half years I feel that should anything ever show in the larynx of the person whose history I am about to report, it must be considered as a new involvement, certainly in no sense connected with the old one.

Mr. ———, a clergyman of the age of 47, consulted me on March 23, 1903, complaining of hoarseness, which had been annoying him during the whole winter, but during the last few weeks so great had it become that he had been compelled to relinquish all public speaking. His history was a negative one, except that he had used his voice in his professional work freely and without stint. During twenty-five years of active pastoral work nothing had troubled him about his throat. His general health had been good. His family history was absolutely negative as regards predisposition to tumor growths.

Examination showed a very healthy appearing neck and throat. Some slight naso-pharyngitis was present; otherwise nothing abnormal about the nose and throat until the larynx was reached. Here one found, on first examination, the right vocal cord and arytenoid normal in contour, and slightly congested, as was the whole interior of the larynx. The whole left

half of the larynx seemed much swollen and no clear view of the vocal cord could be obtained, it being obscured by the left false cord. I made no definite opinion at this interview, and prescribed simply inhalations of *oleum pini silvestris*.

In a couple of weeks the swelling of the false vocal cord had diminished and one could plainly make out, as the congestion disappeared, a white, papillomatous mass which grew from the upper aspect of the cord and apparently came out of Morgagni's ventricle. But little of the cord was visible, as the growth covered nearly the whole length. While the larynx seemed to be improving in a general way, the patient was also educated so that he became very tolerant of manipulation.

It being my firm conviction that too much instrumentation is extremely bad for any growth in the larynx at the age of this patient, I deferred doing any cutting operation until I was sure I could do it well. During all this period of three or four weeks the patient was directed to only speak in very subdued tones, and was to do no public speaking whatever. Finally, late in April, a prolonged session resulted in complete removal of all visible portions of the growth, which was friable and came away only in small pieces. Some of these were subjected to microscopical examination. This was indefinite in its results; a soft, papillomatous mass, which presented no epithelial nests and only a suspected activity in the cells, as shown by very doubtful mitosis. Following the operation the patient had no great pain, the vocal cord was freely movable, and there was no evidence of glandular activity in the neck.

The growth promptly recurred, however, and at the end of June was again thoroughly cleared out. The microscope showed the same doubtful condition as before. At this time the ventricle was cleaned out as well as possible and the whole surface cauterized with pure nitrate of silver fused on a probe. Considerable reaction followed, but quickly subsided, and as soon as the growth showed any sign of recurring (as it subsequently did), it was promptly cauterized with the pure stick. This was done perhaps five times in the following two months, but failed in the end to restrain the growth, although apparently very effective at first.

In September it became apparent that something more radical should be done if the patient was ever to use his voice

again. Accordingly, in the last week of the month he was sent, with both microscopical preparations, to Dr. Jonathan Wright for examination and advice. Dr. Wright reported that when he looked at the specimens he was inclined to believe it benign, but when he looked at the larynx he was placed very much in doubt. In such a case where the growth was so broad of base he felt that he ought to advise removal through external incision.

This being my own view and the patient acquiescing, on the 10th of October Professor William H. Carmalt did a thyrotomy with the usual ether narcosis. A simple median incision down to the isthmus of the thyroid; tracheotomy just above it. Anesthesia with chloroform for the rest of the operation. Larynx was split open in the usual manner. Once this was done, there was not the slightest room for doubt as to the expediency of the operation. Quite a large mass of tissue was removed with forceps and scissors. To do this thoroughly it was not possible to spare either the false or the true cord. The perichondrium seemed perfectly healthy. After stanching the bleeding with hot sponges, every suspicious area was thoroughly cauterized with Paquelin cautery. By this means also all the bleeding except the merest oozing was stopped. The larynx was sewed together, the tracheotomy tube removed, and the whole wound stitched up, leaving a small drain at the bottom. The patient was put to bed with the feet slightly raised, and passed a fairly comfortable night. Except for a most profuse bronchorrhagia, which at first relieved the excessive dryness of the early night, and which continued with great violence for the first three days and then suddenly ceased, there was an uneventful recovery. The temperature never went above 100.2, which was on the third day. Except when one stitch toward the bottom of the incision, below the level of the cricoid ring had become infected, the wound healed by first intention. This stitch abscess discharged considerable matter, and finally a sinus developed which ran between the skin with the superficial fascia and the anterior wall of the larynx, and a probe, after passing up three-fourths of an inch, entered the larynx exactly at the anterior commissure of the vocal cords. The healing of this sinus proved very annoying and tedious,

at one time quite concerning us as to whether, in the florid granulation tissue which developed, cancer cells might not be in evidence. Early in December it finally healed up in response to very urgent measures, and since then the patient has had no trouble whatever either with his larynx or with the wound. During the tedious healing of the sinus the interior of the larynx completely healed over. At the end of the first week a slough or scab came off, and from that time on the interior of the larynx was free from all symptoms. He had no trouble in breathing except the first night when the sticky mucus, which preceded the bronchorrhoea, greatly annoyed him, although at no time was there the slightest distress for lack of breath, the annoyance consisting more in the pain which was caused by the coughing to remove the sticky mucus from the wounded surfaces.

During the first three days he was nourished by rectum, and after the first twelve hours was allowed to suck ice and swallow sterile water in small amounts. The pain on swallowing was severe the second and third days, owing to the motion of the larynx in the wound, but this diminished gradually thereafter.

Examination of the growth showed undoubted epithelial nests, and in the lower layers marked cell activity with multinucleation of the cells, leaving no doubt as to the diagnosis.

No attempt was made at the time of the operation to remove any of the lymph glands, as there was not the slightest evidence of any involvement.

At the present time, and since February, 1904, the patient has spoken in a perfectly audible but husky voice. This huskiness is at present very slight. At my suggestion he has entered into editorial and other duties which require little or no use of his voice. Now he can speak loud enough to fill a large audience room, but does not attempt it. A fairly good presentment of a vocal cord has been produced in the shape of a dense white band where the true cord should be and of which it is probably a part. The false cord is flatter than normal, and Morgagni's ventricle practically eliminated. I have seen him within a month, he having made the journey to me in order to make this report complete, and his larynx is in absolutely perfect condition.

By way of comment upon the case it may not be amiss to emphasize these facts:

The ever-present difficulty in coming to a diagnosis.

The wisdom, even when in doubt, of operating so as to insure complete removal.

The repeated observation of the surprising difference in the appearance of the growth when the larynx is opened.

The impossibility of being sure you have removed everything malignant; hence the wisdom of the use of the Paquelin cautery.

The possibility, when the larynx is roomy, of shutting up the whole wound instead of leaving the tracheotomy tube in place.

The unquestioned advantage of the absolutely recumbent position with the feet raised.

And finally, that when you have an intelligent, brave, and tractable patient how small the suffering seems as compared to the mercy of a complete cure.

DISCUSSION ON THE PAPERS OF DRS. COHEN.
INGALS AND SWAIN.

Dr. E. Fletcher Ingals: Dr. Cohen spoke of using cocaine and adrenalin in removing growths from the larynx. I do not see any reason why the adrenalin and the cocaine should not be put together, so as to save some of the mopping. In the early days of cocaine I had a good many patients suffer from disagreeable constitutional symptoms even when I used only a 4 per cent. solution in moderate quantity. I have been surprised at the large amount of cocaine used by some of my colleagues without producing these disagreeable symptoms. One of them uses an adrenalin solution, 1:1,000, into which he dips his mop; then he puts the mop into the crystals of cocaine, and applies it freely to the noses of even little children. He says he has never had disagreeable constitutional symptoms follow this procedure. During the last year or two I have frequently used, without ill result, 1:1,000 supranalin solution, putting in enough cocaine to make a twenty per cent. solution. I suppose the adrenalin prevents the absorption of the cocaine, and thus prevents the constitutional effects.

Dr. Cohen also spoke of mopping the wound with the compound tincture of benzoin. It seems to me that this would be improved by putting in an excess of the gum-benzoin, two drachms to the ounce. This makes a film that will last considerably longer than will the compound tincture alone.

Dr. Thomas Hubbard: I have observed that in etherized patients adrenalin does not produce local ischemia—at least not in the nose. Whether it was merely a coincidence or was due to some fault in the solution I was using (although this was freshly prepared), or whether there is some physiological antagonism between ether and adrenalin, I do not know. I should like to know whether others have observed the same thing. I have not made the same observation with reference to chloroform.

Dr. J. Payson Clark: I should like to know whether a microscopic examination was made of the growth after its removal. I think Dr. Cohen's method of operation gives valuable suggestions regarding the mode of procedure in these cases.

I also want to report the present condition of a patient of mine with cancer of the larynx, operated on ten years ago. He was then fifty-nine years of age. The growth was removed

by thyrotomy. The larynx was split, and the soft tissue on one side of the larynx thoroughly removed, and he made an uneventful recovery. The case was reported two years afterward, and the article was published in the Boston Medical and Surgical Journal. The diagnosis was epidermoid cancer. I have a letter from the patient, which I received just before leaving home. In this he says that he is now seventy years old. His general health is good and his voice is quite strong, although not so strong as before the operation. His friends notice no difference in it in conversation. I wish to put on record this case in which the patient is well ten years after the operation.

Dr. Gordon King: In the case of a patient of mine operated on two years ago for an epithelioma about the size of a small coat button, just above the vocal cord, we had to do a preliminary tracheotomy and then a thyrotomy. He is an enormous man, weighing two hundred and eighty pounds. The growth was removed down to the cartilage, and then Dr. Swain's method of cauterization of the seat of the growth was pursued. The man is a lawyer, and was very much concerned about the probable effect of the operation upon his voice. I felt a little uneasy about it myself. The larynx now shows scarcely a trace of the operation, and the patient's voice is perfectly preserved. We removed about half of the vocal cord, cutting right down to the cartilage. The cord has been reformed, and the mobility of the cord is preserved. He says that his voice is even better than before the operation.

Dr. Robert C. Myles: I believe that there is something individual in these cases of epithelioma of the larynx. At the Congress held here four years ago, I reported a case in which I had removed a tumor from the larynx near the vocal process about a year previously. It was found to be an epithelioma. I asked the patient whether he wished to undergo an external operation and he said he did not. I saw him about three months ago, and found that he has had no trouble since. I do not believe that this growth was a true epithelioma of the type that penetrates deeply, although the pathological demonstration suggested it to be so. I do not believe that a cancer of the deeply penetrating type can be so easily cured. The one removed in this case was probably similar to the kind of epithelioma that sometimes grows around the eye. Oculists remove a great many of these from the eyelids and the patients recover.

Dr. D. Bryson Delavan: I have lately seen a case operated upon by Dr. B. Farquhar Curtis, of New York, just ten years ago, who is to-day perfectly well and in very active business. Such a result is a rare exception to the rule. The general

opinion of the leading authorities of the day is to the effect that cancer does not admit of cure by surgical means. Undoubtedly the complete removal of a growth in its early stage will be likely to palliate the condition and perhaps add greatly to the duration of the patient's life and still more greatly to his comfort. An operation may often relieve, but to talk of its curing is almost to beg the question. The time-limit arbitrarily set upon cases, whereby, for instance, it is said that a case that has been free from recurrence for such and such a length of time must be considered as cured, is not to be relied upon.

Operations for this trouble have been presented and discussed for years, yet no better description of the correct technique could be offered at the present moment than the one first given by Professor Cohen. Under this method of procedure we are likely to obtain the best results. All methods, however, are disappointing. We cannot, therefore, too earnestly urge haste upon those trying to discover the radical cure for cancer. While the history of cancer of the larynx is typical of cancer throughout the body, it is a little more distressing here than the same disease as found in some other parts of the body. I believe that each one of us should stimulate those engaged in investigation work to use all possible speed in instituting the advance that we feel sure will ere long put surgery entirely out of this field.

Dr. Harris P. Mosher: A recent case brought home to me the fact that certain cases, although they cannot be cured, can be relieved, and the amount of relief is well worth while.

A desperate case of carcinoma of the larynx was admitted to the Massachusetts General Hospital. The patient was cyanotic and semi-conscious. Dr. F. C. Cobb did an emergency tracheotomy. A little later, when the diagnosis was established I exercised the larynx. At the time, the operation did not seem worth while because in order to get beyond the growth the trachea had to be removed down to the supra-clavicular notch. The anterior wall of the oesophagus was removed almost to the same point. There was a recurrence along the right internal jugular vein. A second operation showed that the growth surrounded the vein and extended beneath the clavicle into the chest. Further operation was useless. The point of this case is that the patient was suffocating and soon would have been starving, but operation made him comfortable for four months. He was a young man, and in social position little more than a laborer. Had he been a man at the head of a large corporation where his judgment and experience for a few months longer would have been of the greatest value, the operation would have enabled him to perform his duties for that length of time. This hopeless operation, therefore, had this to recommend it: it

freed the patient from the greatest suffering and gave him the use of his mental faculties for a valuable period.

Dr. Cohen: With all the rest, I congratulate Dr. Ingals on the success of his case of intralaryngeal extirpation. He mentioned, in the report of his case, that his patient did not get better until after an attack of influenza. I have seen a number of patients with malignant disease of the throat get well after influenza, as also after an attack of erysipelas.

As to mopping with cocaine and adrenalin together, I have no doubt that it would do just as well, but the cocaine in my case was intended to get rid of the reflex of the larynx. As 1:1,000 adrenalin was employed, its use was confined to the immediate region of the growth.

The reason I used compound tincture of benzoin (although I usually prefer to cauterize with acid nitrate of mercury), is that in this case the perichondrium had been removed and I thought an escharotic would do injury.

I thank the doctor for his suggestion of adding the gum benzoin; for I have no doubt that it will make a better lasting varnish. I almost always give a general anesthetic—chloroform, unless the patient's physician is much opposed to it. I have no experience in the use of adrenalin in cases under ether anesthesia.

Dr. Swain: First, as regards adrenalin and ether: There is an antagonism between them in their effects upon the several blood vessels. The action of ether is to dilate the vessels, as evidenced by the flushing. The adrenalin works by contraction of the vessel-wall.

In answer to Dr. Clark's question, I would say that the case was positively epithelioma. Sections made through the whole growth showed the penetrating form of the disease. I omitted reading the report of the microscopical examination in order to make my paper briefer.

Dr. Myles says that there are various kinds of epitheliomata. There are varying degrees of malignancy in every kind of tumor.

In answer to Dr. Delavan, it was for that very reason that I related my case. With so much said against operations for cancer of the larynx and so much evidently bad in our prognosis in such cases, here was an instance in which the sunny side came out, and we ought to bring that side into bold contrast with the darker picture brought up by Dr. Delavan. Some cases we can certainly cure. As we do not now possess any method for curing these cases except surgery, let us make this accomplish as much as possible.

THE PROBLEM OF ASEPSIS IN THE ROUTINE OFFICE WORK OF THE LARYNGOLOGIST.

BY THOMAS HUBBARD, M. D.

It would be futile for any one to attempt to detail a perfect aseptic system adapted to all of the varied requirements and facilities of laryngologists. Our special art is developing rapidly to a place of importance and recognized scientific accuracy, but I believe we have been remiss in not applying the fundamental principles of asepsis, demonstrated in the general art of surgery to be essential and practical. But I should add as an offset to this criticism that there are undoubtedly enough of applied aseptic hobbies in the practice of a group of laryngologists to make an ideal system. Throat and more particularly nasal surgery test the merits of aseptic technique, but of necessity a paper of this character must consider routine treatment for it may be stated as a positive conclusion that where routine treatment is conducted without particular regard to cleanliness there aseptic surgery is not possible. In other words, a most important factor is to have a clean workshop. A perfect surgical equipment may become hopelessly contaminated by carelessness in routine treatment, and, on the other hand, a very simple and homely outfit may with care be kept so very clean that the best of surgical requirements obtain. The laryngologist who develops a particular system of operation becomes naturally attached to the special kind of illumination, his instruments in place and handy, and all this inspires a confidence to meet emergencies. This is a factor in the persistence with which most of us cling to the practice of doing surgery in the office rather than in the hospital. But I have no doubt but that another decade of progress will find many more laryngologists doing all of this important work in specially equipped hospitals. This is ideal, and will solve the problems which at present bother us not a little.

In an address recently delivered a distinguished surgeon had occasion to lament the growing evil of what he termed "assaults on the abdomen by untrained operators," and in the course of his remarks defined *surgical training*. Two years at the elbow of an experienced operator and under the constant supervision of many critical eyes establishes a system of technique that becomes a fixed habit and leaves the mind free to grapple with the real surgical problems as they develop in the course of the operation. It is to be expected that the influence of the "trained surgeon" will be more and more an important factor in the progress of laryngology, rhinology and otology, and that a higher standard of aseptic technique will obtain.

But to-day we are doing the most of our work in office operating rooms, at best not perfect in surgical requirements, and it is well that we occasionally confer as to methods of eliminating certain faults in the routine of treatment and operating. The office equipment of the laryngologist is peculiarly liable to become contaminated by pyogenic germs and the danger of indirect transmission of contagious diseases is apparent. The evidences of accidental infection are not of positive and clearly demonstrable character, but I think that all operators have experienced anxiety over cases having symptoms of severe local sepsis, and still more often do we see delayed healing not accounted for by defective operation. Reports of cases of the most serious type of infection are not rare, and many such cases are never reported. In such instances a careful study of the details of technique is in order and this paper is in part a compilation of faults that I have observed in my own work and equipment.

A floor covering that will stand daily scrubbing, sanitary plumbing, and fountain cuspidore, etc., are recognized essentials; and I may say in passing that, considering the general character of our work, the predominance of cases having acute or chronic transmissible diseases, it is of importance that the *operating room* be of *generous size* and especially *well ventilated*. This we owe to ourselves as well as to our patients.

An abundant supply of *sterile water* is important. Antiseptic solutions as a means of sterilizing instruments should be entirely

discarded, for this practice cannot be regarded as but a mere pretence at cleanliness. When one considers that it takes nearly twenty minutes to sterilize a clinical thermometer in bichloride 1:500 or carbolic acid 2 per cent., the futility of this practice is apparent. *Instruments* must be boiled for at least ten minutes to insure surgical sterilization, and I would emphatically include atomizer tips and the nasal tubes of such instruments as the Politzer inflator. For this purpose the removable tips are desirable, that they may be cleaned and boiled as any other instrument.

To protect *complicated cutting instruments* from the destructive effects of unnecessary sterilization, I have adopted the method of cleaning and sterilizing after using and then wrapping in *gauze* and *paraffin paper* (the same having been cut of proper size and sterilized in alternate sheets). This keeps instruments bright and rustless, and, further, in emergency, it is very convenient to avoid the ten-minute delay necessary for sterilization.

Solutions to be used in the atomizer can be kept sterile in a closed receptacle having a four-candlepower electric lamp. The one that I use maintains a temperature of about 160 degrees. The *cutoff* and *tubing* should be protected by a gauze covering—one made like an abbreviated umbrella cover is easily adjusted, and, of course, the renewal should be a part of preparation for every operation. Operator and assistants should use rubber gloves and gown, if the occasion demands it.

We are now fortunate in being able to procure *syringes* for nasal, post-nasal, and ear irrigation that can be sterilized by boiling. The *asbestos packing*, as perfected by Ermold, is the most satisfactory, and its use eliminates one very prevalent defect in our routine treatment as well as in operations. The *laryngeal mirror* can be boiled for a short time. I have experimented with *whalebone bougies* and find that they stand boiling for half a minute, which removes oily material, and they can then be immersed in carbolic acid, 4 per cent., without impairing elasticity or smoothness, but it should, of course, be borne in mind that all instruments of this character, however cleaned, become brittle in six months, more or less, of service and should always be tested before using. In fact, there is no

excuse for using any instruments that cannot be surgically sterilized, that is, cleaned and boiled.

A very satisfactory substitute for the *gauze handkerchief* (which may be more desirable in operations), is a *paper napkin*, made in this country (Dennison Mfg. Co., N. Y.), and concerning which I have made some investigations. In the process of manufacture an absolutely sterile article is produced, and the makers have assured me that in the subsequent preparation for the market, the work being done by machinery, there is little or no chance of contamination. Culture tests, maceration in bouillon, and incubation for forty-eight hours showed that samples from broken packages were practically sterile.

The *steam sterilizer* is an absolute necessity in every office, one that subjects contents to live steam heat and dries by superheated air.

I have applied the *small test tube method of sterilizing gauze* for nasal operations, and find it practical to prepare in small rolls, enough for one ordinary packing in a tube.

The operator's hands will of necessity come into more or less frequent contact with the patient's face, and as a routine procedure there should be a thorough washing of face, or, as some operators prefer, a partial *gauze mask* may be applied. I have found the clips and elastic band used by dentists to retain the rubber dam very satisfactory for the purpose of retaining the gauze mask. The *reflector* can be covered with gauze, without perceptibly reducing illumination, or the small metal clip can be used.

The sterilization of the *mucous tract* to be operated, and of course most of these details refer to intranasal operations, should be attempted, and the most rational process is an adaptation of the method used by gynaecologists in sterilization of the vagina. An irritant like boric acid in sterile water, or a dilute Dobell solution, or glycerine tampons, excite a copious flow of sero-mucus which flushes out the glands and recesses of the mucosa effectually, and then by irrigation a fairly sterile field is assured, excepting in cases having suppurative conditions or atrophic areas. The reactionary flow of sero-mucus, following operation and subsidence of local anaesthesia and ischaemia,

is a most important aid in prolonging the aseptic condition, and this is one reason why a too firm packing should be guarded against—the mechanical pressure preventing the saturation of dressings with the normally aseptic secretion.

Sterilization of the *throat* should be preceded by careful attention to the cleaning of the teeth and mouth, followed by antiseptic spray and gargle, but at best we can only try to remove superficial deposits of contaminated dust. It is not practical to attempt a cleansing of the *naso-pharynx*, before or after operation, the danger of infecting the middle ear being very great, and especially in children in whom the lumen of the tube is proportionately larger than in adults.

The quality of air used under compression for atomizers and direct inflation deserves special study. The location of the intake tube should be given attention, with the purpose of getting air as free as possible from dust and odor. As a rule it is best to have the intake tube near the ceiling of the operating room—supposed to be the cleanest of all—and even when so placed, if the experiment will be tried with capping it with a large ball of cotton, a few weeks' experience will demonstrate the advisability of filtering the air.

Air tanks and pumps are not specially cleaned before being set up, and the contents often have a disagreeable, rancid odor. To deodorize the tank pour in a few ounces of essential oils—cinnamon, cassia, or peppermint—which will impart to the air a pleasing aromatic odor, and at regular intervals saturate the cotton at the intake with formaldehyde and allow the pump to run, valves all wide open, until all traces have disappeared. As to the importance of all this attention to the quality of air in the compressed air tank there may be a wide divergence of opinion. That the tank becomes a reservoir for the accumulated dust there can be no doubt, as sedimentation must take place in the absence of disturbing air currents, and with years of service there must be a considerable deposit.

I have had made culture tests, using agar Petri dishes and slants, to determine whether or not the dust that accumulates in the tank is carried into the exit tube and escapes in the air current. Exposures were made under varying conditions, the

air from a tank long in service and that from one recently set up, with control tests of the air of the room, and the only conclusion that could be drawn is that the air from the tanks is in a measure freed from dust by the process of sedimentation within the tank, but there is also a difference in result depending on the kind of cutoff used. One that simply compresses the rubber tubing when open wide gives a free lumen and large volume of air, and more accumulated dust escapes than obtains with the piston cutoff, which allows only a small stream of air to escape and does not agitate the main body of air in the tank or tubing. Although experiments along this line are of little value in determining the purity of the air used in atomizers and for direct inflation, and I present them with no claim to scientific accuracy, yet I feel justified in thus calling attention to the ease with which the air drawn from almost any source can be rendered surgically clean, and safe for use at any stage of an aseptic operation; and also to the facility with which we can prevent the contamination of the solutions in atomizers in so far as the compressed air is concerned. *Dry cotton-filtered air in a tank kept as clean as possible by occasional use of vapor antiseptics should be a feature of every well-ordered office operating equipment.*

In closing I will say that I trust that this paper will be taken for what it pretends to be, i. e., merely a compilation of suggestions for the promotion of surgical cleanliness in routine office treatment and special operations. The surgeon, in whatever special field or working environment, must constantly bear in mind that only by high ideals in the refinement of cleanliness, in theory and practice, can he expect to stimulate his associates and assistants to the proper discharge of their part of the work. The fact that the individual is immune to the ordinary bacteria that inhabit his respiratory tract has cultivated in the profession a degree of carelessness bordering on indifference; but it is none the less a surgical misdemeanor to introduce foreign germs, and this can be guarded against only by the development of a thoroughly consistent and practical system of surgical cleanliness in office routine treatment and surgery.

Discussion.

Dr. Gordon King: I have an instrument that I should like to show in connection with this device for the sterilization of sprays in office practice. It causes annoyance and difficulty and often delay, to keep the spray tips thoroughly sterilized. This little sterilizer is attached to the back part of the cabinet. On the back part is a rack for the sprays. There is a stand arranged to fit on the back of the cabinet, with the gas jet underneath for the heating.

I use the same kind of sprays that Dr. Hubbard showed with his instrument. When they are sitting in the rack, the ends of the spray project into the sterilizer. Being just above the level of the water, they are being steamed all the time. The amount of gas used is insignificant, and does not vitiate the air. You keep a guard underneath to protect the bottles, and take it off if you want the spray kept at a warm temperature. The bottles are liable to crack if the heat is great on one side.

The slot in the sterilizer corresponds to the height of the ends of the sprays; so, when thrown into the rack, there is no difficulty in fitting them in easily. It is devised so as to hold eight or nine sprays in the ordinary cabinet rack. They are not only kept thoroughly sterilized, but the water is constantly boiling, and although I have no scientific measure of the temperature and of the amount of sterilization resulting, I am sure it must be sufficient.

The sterilization by means of steam has a double advantage; if you put the point of the sprays into the boiling solution they are likely to take up some of the water; and this gets into the spraying solution, either by capillary attraction or by syphon action, the spray soon becoming half filled with water. Sterilizing with steam also keeps the sprays pretty well cleaned out. They are always dripping with condensed steam, and are thoroughly washed of mucus, so they do not become stopped up as in the dry method. If the mucus dries in the lumen of the spray you have to run wire through it.

This device serves the purpose admirably in office practice. It is made by a local instrument maker, and consists of an ordinary sterilizer with a slot cut in it, and a bracket to attach it to the instrument cabinet.

I was very much interested in Dr. Hubbard's paper, especially in regard to the sterilization of the instruments and of the air. I have not been quite so particular as he has been, but I think it is a very good idea. In conversation with him, he told me that in the filtration of air there are so many impurities taken up by the filters that he puts on over the ends of the sprays that we must often project a good many of

these germs into the fields of operation, especially wound surfaces. We have adopted the method of using these little tongue napkins. I believe Dr. Hubbard uses the paper napkins instead. The dental napkins, four or five inches square, are, however, very convenient. They cost less than half a cent apiece, and are practically always sterile, though you can sterilize them if you desire to do so.

Dr. Arthur A. Bliss: We are all very much indebted to Dr. Hubbard for presenting this paper. He has given me many new ideas as to office asepsis. I think it is surprising how seldom infection occurs with even ordinary care; and yet I do not think many of us have carried the details of office house-keeping to such an extent as Dr. Hubbard relates. That is no excuse for not so doing. All these details are of importance, especially the practical method of obtaining surgical cleanliness in our office work.

Dr. Walter F. Chappell: We are certainly all indebted to Dr. Hubbard for taking such great care of the patients. I had hoped that he would also suggest some method by which the doctor could be taken care of.

I am sure that all of us, in using the sprays and the syringes for the nose and throat, find that the patients often cough something on to the doctor. I had this forcibly brought home to me this winter. A woman was sent to me, and I found a large tumor down on the lateral side of the pharynx, which proved to be an abscess. On opening this we had the bowl ready for her to expectorate into, but the pus, running out quickly, frightened her, and she jumped up and expectorated the contents into my eyes. I immediately washed them out, and took the ordinary precautions, and, always having been well and strong, I thought no germs could get into me. Five days afterward I had a severe chill. I went to bed, and during the night my eyes and face began to swell. I had a septic dermatitis, extending from my eyes and ears down to my neck, and lasting five days.

After this experience I certainly felt that hereafter I should very well remember the danger to the doctor in our office work. I think that there should be some way by which we could be protected. It is very rarely that a laryngologist goes through his lifetime without something of this kind happening to him.

Dr. George L. Richards: Ordinary automobile goggles, made of gauze and sufficiently large to cover the face, could be designed for this purpose. This arrangement would be cheap and it could be sterilized. The doctor could wear it whenever infection was thought possible.

Dr. Robert C. Myles: This subject is very broad and wide,

and, of course, Dr. Hubbard's known genius for practical things makes him a very good leader. I dare say that each one of us will improve in our method of protecting ourselves and our patients by using the newly suggested devices as soon as possible. An experience meeting of this kind will give us what we are looking for the most quickly.

In operating I am frequently covered with blood from the top of my head to my feet. There is a peculiar kind of oiled-silk named "zonos" which I use to cover the patient and myself. It is very thin and gives quite good protection from the fluids.

I also have on hand half a dozen panes of glass, and a nurse holds one of them in front of my face while operating. In the coughing, gagging cases, when extensive dissections are made around the throat, and even in laryngeal operations, these are of use. I often need three or four before an operation is finished. They are simple, cheap and easily washed and sterilized. There are glass shields that drop down from the ceiling, but these cannot be quickly changed. The simple pane of glass solves the problem better than anything else.

Regarding asepsis in the office, we are just on pioneer ground. I have my instruments boiled, the same one perhaps a dozen times a day. It is an annoyance, but I do it on general principles. Our office attendants are not properly schooled for this work, and are not always as careful as they should be.

It is true that we have no definite knowledge of the occurrence of much sepsis in office practice, but it is possible that there are some forms of septic conditions that are not localized in their manifestations. Sometimes, after operations, the patients do not do so well as we should like, in a general sense, and this may be the result of contamination. If some one would take up the subject and give us his conclusions as to a practical and economical way of securing asepsis, I believe it would be a great advantage to the profession at large.

The asbestos-packed syringe is the only one I find that can be properly sterilized.

Dr. G. Hudson Makuen: I should like to ask Dr. Hubbard whether he has had any experience with the metal piston syringe.

Dr. Hubbard: Concerning the metallic piston syringe, they are very satisfactory, but they need a great deal of attention to keep them clean and in working order. You cannot leave a solution in them without ruining them completely. The asbestos-packed syringe is the best. Those packed loosely are much better for delicate work, and are operated with as little friction as possible.

Dr. Chappell's inquiry has been answered by Dr. Myles better than I could have answered it, but I will add that in my opinion the laryngologist should wear a protecting coat or gown in all of his routine work to prevent contamination of clothing, which in turn becomes a source of infection. When there is a reasonable chance of doing an aseptic operation, I think we should go to the extreme care of wearing a gown and rubber gloves. Dr. Myles has hinted at this and I find that Dr. King wears rubber gloves as a rule—partly for his own protection. I would regard Dr. King's sterilizer for atomizer tips as especially adapted to dispensary work. It would doubtless be thoroughly efficient. But my method—boiling the removable tip—has the merit of simplicity, and, further, the spray-heater keeps the solution sterile.

A REVIEW OF THE METHODS IN USE FOR THE
REMOVAL OF ADENOIDS, WITH THE DE-
SCRIPTION OF A METHOD WHICH IS
THOROUGH, RAPID AND SAFE.

BY GEORGE L. RICHARDS, M. D.

The tissue to which the term "adenoid" is usually applied is a soft, lymphoid mass lying in the vault and posterior wall of the naso-pharynx, and somewhat, though to a lesser extent, in the fossae of Rosenmüller, posterior to the Eustachian tube openings. It is an overgrowth of normal glandular tissue, designed to moisten this region, as well as help in the moistening of the inspired air. The adenoid becomes pathological on account of its size, its resultant interference with nasal respiration, face and jaw development, and proper aeration of the middle ear through its proximity to the Eustachian tube openings, and its possibility of tubercular or general inflammatory trouble. Hence its need of removal when so enlarged.

What of the technique of the operation? While the need of the operation is well nigh universally recognized, and it is being largely performed by physicians of experience and without, its technique as usually performed seems to me very crude and not to have kept pace with the general advance of rhinology. Hence I bring the subject before you for further discussion, even though it may be thought that there is nothing new to say about adenoids, since this Association is to a large extent a teaching body and should help mould the thought of the profession so far as rhinology is concerned. The operations have been done rather blindly in a cavity where vision was impossible. The instruments have been mostly patterned after two models, though with many variations. First, some form of ring knife or curette which, when very sharp and skillfully used, will remove the growth, but when dull, as must frequently have been the case, since these are hard to keep sharp, only im-

perfect removal of the growth is attained, while, at the same time, it tears the sub-mucous tissue, leaving adhesive bands. These instruments are variously named, one instrument maker showing in his catalogue twelve types. The curette of Gottstein, or one somewhat like it, has been the most popular. I am sure that any one who has operated much with this type of instrument, if he has had opportunity to re-examine some of the cases some years afterward, must have found, occasionally at least, adhesive bands, to say nothing of possible injury to the Eustachian tube. Dr. Bliss, in a paper before this Association in 1898, made substantially the same statement, saying that apparent recurrence was probably due to cicatricial contraction after either incomplete removal or possible injury to the parts by the use of the curette.

In a paper read before this Association last year, to which I shall again have occasion to refer, "Removal of Adenoids Through the Nose," by Dr. Freer, he states very succinctly one of the disadvantages of the ring knife. "Its blade does not cut in the manner of a knife by slicing, as it is drawn through the tissues, but its edge impinges squarely against the material to be removed, with no sliding motion, so that there is a tendency to scrape over the adenoid masses rather than to cut them off, especially when they are freely movable and the vault of the pharynx is concave laterally so that the edge of the knife does not fit flatly against it.

"A certain type of adenoid growth often encountered by me is also unfavorable for the ring-knife. I refer to the tough, firm, fibrous enlargement of the pharyngeal tonsil found in some children and often in adolescents and young adults. The blade is apt to slide over such masses without cutting away more than a small portion of them."

All these objections, as will be seen later, will be obviated by the method which I am about to describe.

The other type of instrument is some kind of cutting forceps of the so-called Löwenberg design, with its many modifications, some with blades that meet and some with invaginating blades, which removes the adenoid piecemeal, with as much more tissue as suits the fancy or lack of skill of the individual operator. No longer ago than 1906, in one of the largest and best-equipped

clinics of this country, I saw an operator take a large Brandegee forcep, which is a modification of the Löwenberg (an instrument which I have used and gave up many years ago), and after first bringing out a little adenoid, kept on until the third introduction brought mucous membrane and the fourth brought away unmistakable muscular tissue, when he announced that everything was out. It seems desirable to remove the adenoid, and this only, with as little destruction to the normal functioning of the region as is possible, so as not to condemn the little patient to a future permanently dry naso-pharynx.

In this connection I think we have dwelt unnecessarily much on the necessity of cleaning out the fossae of Rosenmüller on account of its effect on the ear. The main portion of every adenoid is central, and if that is removed the little that remains in the fossae of Rosenmüller will not be of much account, and it is preferable to leave it rather than destroy the mouth of each Eustachian tube in the process of removal. Dr. Gradle, in a paper published in the Medical News, December 19, 1903, says, "Undue stress, it seems to me, has been laid on the extension of adenoids into Rosenmüller's fossae. Ordinarily the base of the growth does not extend quite so far laterally, though soft vegetations sometimes spread out along the surface. In rare instances lymphoid tissue really fills the fossae after the tonsil has been removed. This can only be taken away with a small curette, provided irritation of any kind indicates its removal. Large wing-like masses of lymphoid tissue, which in rare instances descend from the fossae to below the level of the soft palate, I have found to be infiltrated reduplications of mucous membrane, independent of adenoids proper, as they occur sometimes without the latter." As a matter of fact, the little that is in the fossae of Rosenmüller can usually be removed by careful manipulation with the small ring knife or a very small forceps of the original Hooper pattern, or even crushed by the tip of the finger itself. The Eustachian tube lies quite a little distance in front of the posterior wall, on the side wall, projecting somewhat into the naso-pharyngeal space, and is affected by the adenoid by mechanical pressure or by reason of the general congestion which results from the adenoid. The

tube mouth is cartilaginous and the adenoid does not of itself invade it. I have paid particular attention for the last two years to this point, and while there is no doubt but that the Rosenmüller fossae frequently does contain some hypertrophied tissue, I think the importance of removing every last vestige of this has been overestimated, to the great danger of injury to the surrounding structures.

I have gone over the transactions of this Association for several years to see what was said touching the technique of the operation.

In 1892 Dr. Jonathan Wright presented a post-nasal cutting forceps.

In 1898 Dr. Delavan, in a paper on personal methods, refers to ring knives, sharp spoon, Gottstein instrument, finger nail, Löwenberg forceps, modifications of Gleitsmann and Hooper, wire snare or loop adenotome.

1899.—Dr. French showed a modified Löwenberg.

1904.—Dr. French showed another modification.

1906.—Biting forceps shown by Dr. Freer.

The method advocated by Dr. Freer is no doubt satisfactory in his hands, but seems to me one which can hardly be used to advantage by the average person, makes the operation unnecessarily long, is liable to result in more or less injury and reaction to the nasal tissue, and brings away the growth in small pieces when it can be removed much more expeditiously and quite as thoroughly, if not more so, by the method to be described. Dr. Freer's method is an improvement over the operation with the nasal snare as practised by Chiari some years ago, and presumably abandoned by him before now.

The ideal operation is one which removes the adenoid tissue most thoroughly and rapidly and with the least traumatism, hemorrhage and general shock. This is fulfilled more certainly, so far as the instrument is concerned, by the adenotome of Schütz or some of its modifications, the detailed technique of which I shall describe. This instrument is on the principle of the old tonsillotome, cuts with a curved knife, and leaves a smooth surface, permitting rapid healing. It was first described before this Association in 1897 by Dr. Farlow, who brought it home from Europe and had Codman and Shurtleff

make up some from his model. The instrument, variously modified like other surgical instruments to suit individual tastes, especially by Gradle of Chicago and Schadle of St. Paul, has been used ever since. Hence I claim nothing whatever of originality. I am only trying to popularize its use. It consists of a sliding blade in a sheath, made to fit the naso-pharynx, and of varying sizes and widths, three sizes being needed.

Dr. Farlow first used it on young adults and without anesthesia. The first instruments as made by Codman and Shurtleff were rather too long from above downwards for use in children, so that, like Dr. Farlow, for several years I used it only for young adults, without anesthesia, and so recommended it in two publications. It seems never to have become popular, however, judging from reports from surgical instrument houses, and in all the Transactions of the American Laryngological Association from that date (1897) to this I find no reference to it, except in one instance by Dr. Farlow himself. If other members of the society have used it, the fact does not appear in the Transactions. The second notice by Dr. Farlow is in the Transactions of 1899, when he presented a large adenoid removed with the Schütz instrument. In general laryngological literature (American) I find but few references to this method: Gradle in publications in 1901, his text book in 1902, and in a paper in 1903, strongly recommends its use. Schadle, of St. Paul, modified the instrument on the principle of the Mackenzie tonsillotome, and I think described it in an article; Farlow, previously referred to; my paper in Transactions of the American Medical Association, 1902, and my book on the Nose and Throat, 1903, page 193. I have looked up several text books, some more recent, but find no mention of the method. No doubt there are other references, but I have not happened to find them. Since procuring an improved type of instrument made by the Kny-Scherer Company I have used it in nearly all cases with the greatest satisfaction. There are three sizes of the instrument which I show you, and they can be chosen with regard to the age and size of the child's naso-pharynx, a good plan being to have the middle and smallest size instruments always at hand. There are but

few naso-pharynges in which one size or the other cannot be used. I have so far met with none. The instrument is probably not of universal application; few procedures are.

As used on young children, the technique is as follows: The child being under anesthesia and held in the arm of a nurse, with the aid of the palate hook, a good view of the location of the adenoid can be obtained. (Anesthesia is not absolutely necessary but is certainly to be preferred.) The growth is then palpated with the finger, and if it comes in contact with the postero-superior border of the choanae, it is shoved back sufficiently with the finger so that the upper jaw of the instrument will not hit this portion of the adenoid, and, therefore, the knife fail to cut it. A little side dissection of the growth with the finger toward the centre from the Eustachian tube mouths also aids in getting the growth within the fenestrum. The instrument is then pushed firmly back against the naso-pharynx, that is, sufficiently high and sufficiently posteriorly, and the knife made to cut through, the growth comes out in one piece and the hemorrhage is not any more excessive than with the Gottstein curette, and usually ceases more promptly. The finger is next used for examination, when it is frequently found that there is a little of the growth lying in the lower cavity of the naso-pharynx, just above the atlas-axis articulation. The adenotome is again inserted, pressed firmly down into this cavity, the cut made, and the adenoid removed. Examination with the finger in most cases in young children will then show everything perfectly clear. The finger is next carried up behind each Eustachian tube and the Rosenmüller fossae, and the adenoid, if any is there, is crushed out with the finger. As this in no way interferes with respiration, the finger is usually all that is necessary. If there is considerable there, a very small Löwenberg or Hooper forcep can be used, carried up into each place under the guidance of the finger, or a small ring knife. In a large proportion of the cases this is not at all necessary. The hemorrhage is staunched in the usual way and the operation is over. Examination with the finger a few weeks later shows a perfectly smooth, normal naso-pharynx as the result of the operation: no adhesive bands, no tearing of tissue. If, after

the first cut, there seems to be some side pieces left, as is now and then the case, particularly with adults, the introduction of the smaller size instrument, pushed firmly back and against the side wall, will remove these little tabs. Here care has to be taken in regard to the Eustachian tube to push the instrument far enough backward before sliding laterally, as in Eustachian tubes with very large posterior lips it is possible to cut this lip with the blade. In one instance in my experience this was done. No result followed, as it was simply the cutting off of a little cartilage. There was no earache, loss of hearing or any injury whatever, as there was no tearing or pulling of the tissue on the Eustachian tube. Should there be a little adenoid left directly back of the vomer, an ordinary Beckmann or some modification of the Gottstein curette will remove it, and I always carry these and the smaller forceps of the Löwenberg type in my armamentarium. As a rule, though, I do not use them.

In young adults and older children I have used a palate retractor first suggested to me by Dr. J. E. Schadle, of St. Paul, Minn. This consists of a piece of tape twenty-four inches long, the ends of which for six inches are twisted and then coated with paste and dried. One end is passed through each nostril to the naso-pharynx, grasped with a forcep and drawn out through the mouth, where it is held by nurse or patient. The traction draws the palate well forward and allows the instrument to be easily inserted. Here cocaine through the nose and by way of the mouth answers for anesthesia. The left forefinger, guarded with a sterile finger cot, is used for all examinations. As large an instrument as can be comfortably inserted is used. The first cut is made in the centre, then if any side tabs be left the instrument is used sideways, first right and then left. The finger is then used, the small depression above the atlas examined, and the pad remaining, if any, then cut out. No further examinations are made.

Complications.—In one instance I have had earache; in one secondary hemorrhage six days later. Neither was of any particular account, and could have happened with any method; in fact, earache after operation is less common than when I used the curette.

Cautions—Owing to its slenderness, the knife is occasionally broken (the Gottstein also occasionally breaks; numerous such instances have been reported), usually in the taking apart or putting together of the instrument, in both of which operations care must be taken. The blade should be kept sharp. A small cone slip of Arkansas oil stone is needed for this. The knife should slide freely.

Compare this with the bloody operation as shown in some text books, child on the back, head hanging over the table, anatomical landmarks all reversed, and I cannot conceive how one who has tried the method I have described sufficiently to become somewhat expert at it can ever go back to the older methods.

References.

Dr. Otto T. Freer, Transactions American Laryngological Association, 1906.

Dr. Henry Gradle, Medical News, December 19, 1903.

Dr. Jonathan Wright, Trans. American Laryngological Assoc., 1892.

Dr. D. Bryson Delavan, Trans. American Laryngological Assoc., 1898.

Dr. Thomas R. French, Trans. American Laryngological Assoc., 1899.

Dr. Thomas R. French, Trans. American Laryngological Assoc., 1904.

Dr. John W. Farlow, Trans. American Laryngological Assoc., 1897.

Dr. John W. Farlow, Trans. American Laryngological Assoc., 1899..

Dr. Henry Gradle, Diseases of the Nose, Pharynx and Ear, 1902.

Dr. George L. Richards, Trans. American Medical Association, 1902.

Dr. George L. Richards, Nose and Throat, 1903.

Discussion.

Dr. G. Hudson Makuen: About eighteen years ago, when I was a pupil of Dr. Cohen's, I started to write a paper on the removal of adenoids; and he said then that there was nothing especially new to say upon the subject, but it even now

seems to possess great possibilities for discussion. As the time is short, the Chair would request you to be as brief as possible. This does not apply to the first speaker, who, at the request of Dr. Richards, will be Dr. Farlow.

Dr. John W. Farlow: The additional sizes and shapes which Dr. Richards has shown increase the value of what, to me, has proved an ideal method of operating in certain cases, especially in young adults with centrally situated adenoids. It seems to me that, in order to cut off anything well, there should be a fixed point—a counter-pressure; for you can do it better with something that holds and cuts than with an instrument that merely cuts. The Gottstein curette simply cuts and does not hold the tissue firmly. The use of something like the guillotine, which holds and then cuts, is an ideal method.

The disadvantage of the guillotine is in cases in which we cannot see into the naso-pharynx so as to know how large an instrument should be used; whether the growth has spread about; and whether it will fit that particular instrument. For that reason, it has always seemed to me, in contradistinction to what Dr. Richards has said, that it is adapted to growths that we can see, and not so well adapted to use in the cases of young children in whom the operation is done under complete anesthesia.

Dr. D. Bryson Delavan: My experience with the Schütz instrument was not fortunate. I sent abroad for one about ten years ago, and attempted to use it on a child under complete anesthesia. The blade broke at one corner, and the side-bar, which connected the blade with the main body of the instrument, gave way at its attachment to the shank. I then had an inch of side-bar with three-quarters of an inch of the blade, constituting a slender object of steel with two arms at right angles to each other, which had become entangled in the adenoid at its thickest part, resisting the removal of the instrument. It was very difficult to disentangle this foreign body. Had I been operating without complete anesthesia, the situation would have been awkward. Fortunately the broken fragment finally came away.

One thing that renders this instrument objectionable is that the pharynx must fit the instrument. It is desirable that the instrument should adapt itself to the conformation of the pharynx. I do not believe that three sizes are enough to meet the indications for the different ages and sizes of the patients.

Regarding the Gottstein knives just exhibited, there are other models of this instrument which are much better. The best modification of the Gottstein knife ever made is that designed by Dr. Richard Frothingham, of New York. I have a set containing six different sizes. It is perfectly adapted to

the conformation of the pharynx, is well shaped, and is far superior in every way to any of those now exhibited to us. It is a great pity that Dr. Frothingham's instrument has not been better recognized by the profession, for it would surely prove acceptable.

Regarding the palate retractor exhibited: Our late friend, Dr. Franklin H. Hooper, of Boston, the one who first introduced the method of operating upon adenoids under anesthesia into this country, used a retractor of hard rubber, better in every respect than any metallic retractor. To any one who has not tried it, it can be strongly recommended.

The subject of clearing out the fossa of Rosenmüller I thought had been exhausted long ago. Adhesions and adenoid masses in this neighborhood have a marked effect upon the Eustachian tube and the middle ear. The older otologists advocated this idea very earnestly. Many patients whose adenoids have been removed, leaving fragments in the fossa of Rosenmüller, and whose ear symptoms have not subsided, have been given distinct relief by the removal of such fragments.

Dr. William K. Simpson: I use Dr. Frothingham's curettes. They are by far the best shape of curette that I know of. He has modified them so that they fit admirably the various conditions in the naso-pharynx. This is sometimes a matter of personal experience; but I think, coming down to the forceps, which I prefer to the curette, that the model made by Dr. Concannon is the best. It has a guard, so that one can do absolutely no damage with it. It also has the advantage of invariably taking out the adenoid in toto. This permits one to examine and to show the growth to the parent of the child, which frequently cannot be done when the curette has been used.

Dr. Lewis A. Coffin: I think we are indebted to Dr. Richards for bringing this subject to our attention, as it causes us all to think. At best Dr. Richards' crows are always pretty black and the other fellows' are apt to be a little lame and limp. The success of an instrument largely depends upon "the man behind the gun" and his experience. Dr. Richards has shown some models that he says are very poor—instruments that he has discarded because of their liability to wound the Eustachian tube, but with his own instrument he can cut the Eustachian eminence right off, and it does no harm. The fact is we all have our own particular methods and instruments with which we can work best. Some of the instruments that Dr. Richards has condemned are poor models of good instruments. We all know that a man designs an instrument and takes great pains to see that it is properly made, but when it comes to be made by some other instrument maker, the designer would not recognize it.

Dr. Henry L. Swain: In response to Dr. Farlow's suggestion, some years ago I bought a Schütz guillotine. I liked it, for it did good work. It has lessened my general anesthetics by one-half. In quite young children I have never used the guillotine, being able to work so very nicely with Gottstein's curette and the finger.

Dr. Richards has done what I have put off doing myself and rigged a guillotine shorter in the shank. Limitations of the instrument are that, as there usually is a central mass and two lateral folds, you are liable to miss these lateral masses in your first cut and must either reintroduce your guillotine or use curette forceps or finger nail. Also you often miss the part of the growth on the posterior wall, lower down than the vault. There is no single instrument that has not its limitations, nor any in which frequent use does not give an operator a particular skill with it. If one follows up the Schütz guillotine with a Gottstein curette, one can do the operation very nicely. The guillotine method is not perfect, but it is decidedly worth considering.

Dr. William E. Casselberry: I designed and had made the first adenotome constructed on the guillotine principle. The instrument was catalogued and sold for a number of years by a Chicago house, until the Schütz adenotome appeared, which, though an improvement on mine, was still deficient, its curve too obtuse and its fenestra too narrow. Next came Gradle's which is now, I think, the best adenotome, yet it also has its limitations. I confirm those that Dr. Swain has mentioned, and will mention another defect. After the use of any adenotome I often find on subsequent examination, even though I had apparently removed what looked like a satisfactorily large mass, an oval, correctly contoured adenoid, as if in its entirety, that in reality the instrument had failed to grasp a couple of pieces lying in close behind the posterior nasal openings, and a supplemental operation of some sort has been needed to get the fullest freedom of nasal respiration. While in adolescents and adults without general anesthesia an adenotome is often the speediest and least painful means and Dr. Richards's supplementary methods in using it doubtless will be helpful, it is hardly to be described as an instrument of universal applicability.

Dr. George A. Leland: I want to make a plea for the clearing out of the fossae of Rosenmüller. The adenoids must be removed from these fossae or there will be a great tendency to recurrent earache. When this operation is done for the sake of breathing space only, be it by a laryngological specialist or by a general practitioner, there is often recurrent earache. Why is this? It is because the fossae of Rosenmüller has been forgotten and is left filled with adenoid tissue. This is largely due

to the fact that a curette larger than is necessary has been used, and also perhaps because the fossae are not thoroughly scraped out either with the curette or the finger nail. This can, however, be satisfactorily accomplished by the use of the smaller sized curettes, the operator remembering that the spinal column forms a hard convexity forward in the middle of the naso-pharynx. The Gottstein being passed upward and forward as far as possible, the first sweep should be downward in the median line. This will remove the centrally located mass and as much as can be removed by the Schütz instrument advocated by the reader. The Gottstein should again be passed upward to the top of the naso-pharynx, and the handle carried outward toward the side to be next operated upon; the blade is then drawn downward with an outward sweep when it will go deeply into the corresponding fossae of Rosenmüller and avoid the Eustachian tubercle, cutting away the adenoid masses which are for the most part attached to the posterior wall of this space. If, however, the instrument is thrust into the sides of the naso-pharynx from the opposite side, the Eustachian tubercle will be sacrificed and the fossae of Rosenmüller will not be cleared out.

I want to speak of something that happened at the Pittsburg meeting in 1893 or 1894: Dr. Roe showed a beautiful array of instruments (for correction of septal deformities, I think), when a Philadelphia member called attention to a rule of the Association, that any instrument shown must be presented for tubercle will be sacrificed and the fossae of Rosenmüller will in force.

Dr. Swain: I want to testify that this law is still in existence and has not been repealed.

Dr. Robert C. Myles: Dr. Richards's demonstration is timely. I have no doubt that, for a certain line of cases, this is an ideal instrument; but, as we are teachers to the general profession, as well as aiders to ourselves, I think that there are two ways of looking at it.

We ought to go on certain principles. If an adenoid is to be removed, should this be done by introducing an instrument into a blind cavity, without intelligence as to what the instrument is doing? or should we direct the forefinger in there, and let it inform us? I am opposed to having anyone that has not thoroughly educated the arm introduce any bilateral cutting instrument, such as forceps, without also introducing his finger.

On the other hand, this adenotome is practically protective provided the centre axis of the instrument is kept in a line with the centre of the head. I have tried this, and have shown how easy it is to remove unnecessary parts when this is not

done. If kept in the centre line, it can do no harm. There is a great advantage to the operator who has the elbow education, so to speak. When using the forceps he may tell when he has engaged the Eustachian tube or any other undesirable part by the education of the arm, but I should not trust to this altogether. When using the forceps, the average surgeon should have his finger in the rhinopharynx at the same time. I do not see how anyone can attempt to remove tissue from the Eustachian tube without the guidance of his finger.

About eight or ten years ago I presented before the American Otological Society some specimens of synechiae of the Eustachian tube to the basilar process. I do not know whether they grew there normally, or were the results of adhesions. I have a good many specimens showing complete synechia. There seems to be a union between the adenoid and certain parts on the tube. It would appear to me that if we cleared out Rosenmüller's fossa in its extreme depth we might cause these adhesions. If we place two raw surfaces together, we are almost certain to have adhesions. I have never removed the adhesions entirely, but have broken the bands down to the deeper part. If the instrument is pushed firmly against the back part of the septum one can remove almost the entire mass, but if the engagement is imperfect, there will be a piece left at the upper rim of the choanae, to be removed later with the snare through the nose or by means of the forceps.

I have used the Schütz adenotome a number of times, but not with universal success. With the selection of proper cases I believe that the results will be better.

Dr. Makuen: I regret that among all these beautiful instruments I fail to find a modification of the Gottstein curette that was made by me fifteen or eighteen years ago. It was made with the thought in mind that Dr. Myles has just advanced. I made two modifications: one, this little moon-shaped excavation behind the blade, to enable the operator to get behind the growth; and the other, the little notch in the tip of the handle, which enables the operator to hold the instrument in the correct position, firmly against the posterior wall of the pharynx, so that it may be brought down firmly through the growth without wobbling around in the hand; as it does when it is held as one holds a pen. If you get it firmly fixed in the fourchette between the thumb and forefinger, you can often bring the adenoids out as perfectly and as whole as you can with any other instrument.

Dr. Richards: I do not wish to be misunderstood. I do pay attention to the fossae of Rosenmüller. I have shown the curette and the original Hooper retractor. I merely mean that

the present teaching is that everything must come out so that a good many have torn out everything and the adhesions that appear afterward are just as troublesome as those that have occurred before. In a great many cases in children, the amount of adenoid tissue in the fossae of Rosenmüller is so small and pulpy that it can be removed with the finger.

With reference to Dr. Caselbery's remarks, I would say that I always carry a curette and forceps, to be used if necessary. If anything is left, you can use the curette or forceps. It is sometimes, though rarely, necessary. Before using this type of instrument at all, the finger should explore the growth. You can push the adenoid back from the vomer and detach it sufficiently from the side, so that it all engages in the fenestra of the instrument. Always use as large a Schütz adenotome as can be comfortably introduced.

I did not suppose that many would agree with me, but it is a good thing to occasionally take up these old subjects. I admit that the models I have shown are bad, but they are sold to someone, and the students are buying them. They are described in the text books, and they are going into some child's naso-pharynx.

STRAIGHTENING THE NASAL SEPTUM.

BY ARTHUR W. WATSON, M. D.

In this day of the submucous resection operation for correcting deflection of the nasal septum, the operation of straightening the septum has dropped to the background. Yet, while acknowledging that for some forms of deflection it is an admirable operation, there are those who think that the submucous operation is not without disadvantages and dangers. My own opinion is that when a deflection is corrected without resection, the patient is in a much better condition than he would have been if the framework of the septum had been removed.

That such straightening can be successfully done in a majority of the cases that we meet with, is certain. All deflections which involve the lower part of the septum, generally more or less angular, both horizontal and perpendicular, including those where the end of the septum is twisted to one side; indeed, all deflections, except those of marked sigmoid character, curved deflections of the upper part of the septum and cases of considerable general thickening in narrow nasal cavities, are amenable to the straightening method.

The purpose of this paper is to call attention again to the method of straightening the septum, which I described eleven years ago before this Association. I am induced to again bring forward this method, by the fact that not one of the works on diseases of the nose, published since that time, has described this operation, and very few have even mentioned my name in connection with the subject, while recently several writers have claimed originality for the very methods, the overlap and the beveled incision, on which my operation was based.

I have been operating by this method for about thirteen years, and the results, in hundreds of operations, have been so

good that I am still convinced that it is the best way to straighten the septum.

It is unnecessary before this Association to go into the question of the causes or mode of production of deflection of the septum, or to describe the different forms of deflection that we have to deal with. Suffice it to say that the chief difficulties to be overcome in any attempt to straighten a deflected septum are the redundancy of tissue and the resiliency of the

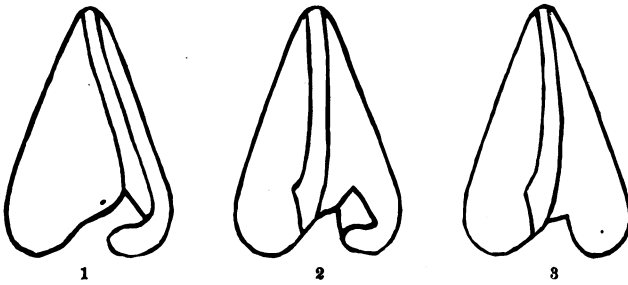


Fig. 1.

Diagram accompanying first description of the operation, May 1, 1896.

cartilage. It is the want of provision to overcome these two conditions that has been the cause of failure of most of the operations devised to correct septal deflection. In the operation which I am about to describe, by overlapping the cut edges, the movable portion overlapping the opposite side of the fixed portion, the redundancy is done away with; and also by giving a fixed support to the cartilage in its new position, the resiliency of the cartilage is counteracted. By making the incision through the cartilage beveled, or oblique, the amount of overlapping is increased, thus increasing the resistance to the displacement of the cartilage.

The steps of the operation may be described as follows: An incision is made on the convex side of the septum, from behind forward, *just beneath* the angle of the deflection, following the angle to its anterior extremity and then curving upward for a short distance. The incision is made on a bevel, or obliquely to the perpendicular. The incision is, by preference,

not carried through the mucous membrane of the opposite, or concave side. The upper part of the septum is then pushed over the lower portion into the opposite side, thus overlapping the lower portion. The same principle is applied when the angle is perpendicular, the incision then being made *behind* the angle, from above downward, the bevel being made from behind forward. An incision is also made at the base, forward

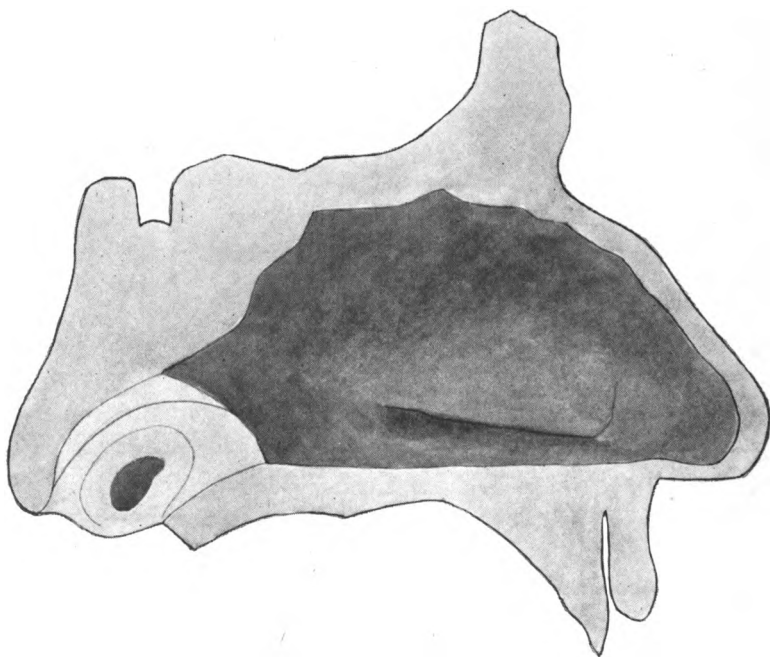


Fig. 2.

Deflection with horizontal angle, showing line of incision.

from the first incision, forming a triangular flap. The posterior edge of the anterior portion is then pushed over the posterior portion. If, as frequently occurs, both a horizontal and a perpendicular angle exist, both of the incisions are made, the incisions meeting at the base. The anterior fragment is first made to overlap the posterior, and then the upper portion, including the anterior portion, is made to overlap the basal portion. This forms a double locking and holds the anterior por-

tion, which has no other support, firmly and permanently in a straight line.

When the deflection extends into the bony portion of the septum, a very common condition, the bony deflection is easily broken and replaced with forceps, there being no need for cutting or overlapping of the bony portion, as when broken the fragments slide on each other and thus take up the redund-

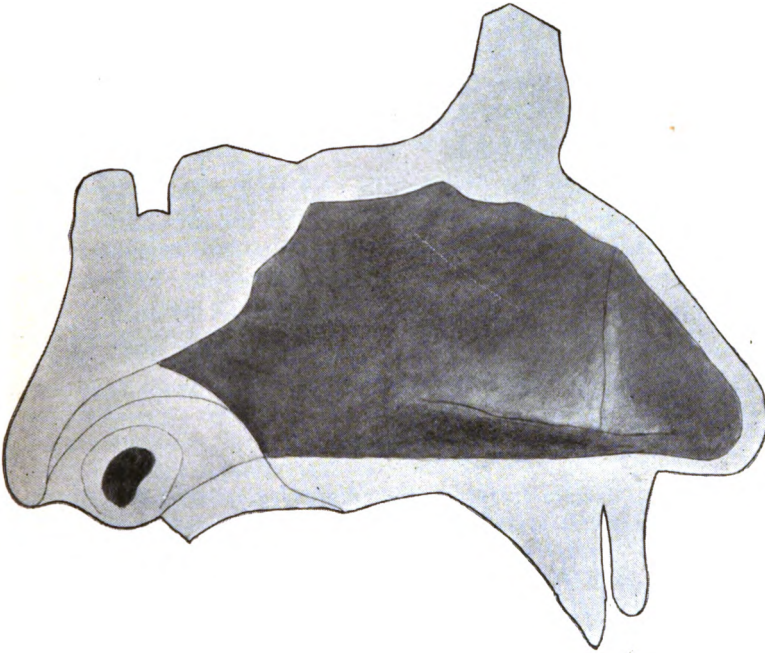


Fig. 3.

Deflection with horizontal and perpendicular angles, showing line of incision.

ancy, and as the union is bony, there is no tendency to return of the deformity.

If the septum is thickened below the horizontal angle, the thickened base, which protrudes into the formerly obstructed naris should, after the parts are healed, be dealt with as if it were a spur, by saw or forceps. If the septum is thin in the lower part, and projects unduly into the naris, it may

be broken into a perpendicular position, in line with the upper portion, thus increasing the overlap and making the septum more firm, the bony base soon uniting by bony union.

After the parts have been placed in line, a folded piece of gauze, iodoform, or other antiseptic gauze, long enough to extend the length of the former deflection, and about one-third to one-half inch wide, and thick enough to just pass easily into the naris, is placed in the formerly obstructed side. This dressing is renewed about every four days, until the septum is healed—about four weeks.

The instruments used are three knives and a septum forceps—a straight knife, like a tenotome, but with somewhat longer shank; the same with blade at an obtuse angle, and one with small blade bent on the flat, almost to a right angle, and sharp on both edges. The first two are used for the horizontal incision; the last for making the perpendicular incision. The forceps are a modification of the Adams septum forceps, the fenestrum between the blades being lengthened to an inch and a quarter, in order to be able to reach the bony part of the septum, as well as the anterior portion.

Discussion.

Dr. Arthur A. Bliss: Since Dr. Watson reported this operation it has been a favorite of mine, among the several forms of operation I employ. I think that there is no one operation that we can rely on in every case. I can speak in the highest terms of the results that I, and others, have obtained from this operation, and I am glad Dr. Watson has brought it again before the society.

It seems to me that it is well for us not to forget the older methods of operating upon deflected nasal septa. The new operation of submucous resection is being, not to say overdone, but it is a fact that the younger men are using it to the neglect of many of the older and well-established methods which have been the product of long years of experience and an infinite number of satisfactory results. I do not want to say anything against the submucous operation, for it applies to a certain class of cases, but, for the angular deflections Dr. Watson's operation is ideal. I do not think it works as well in rounded deflection of the septum, which is without angles, as the Asch operation; but, for the angular deflection, I do not

think that any other can be so quickly done, and is so satisfactory or permanent in its results. Dr. Watson's name should alone be associated with this operation, for I believe that he deserves the credit for devising it.

Dr. Emil Mayer: This operation has been confused with the name of another operation, and has gone by the name of both combined more than with Dr. Watson's own name, and I can commend it very highly. I recall very well his first description of it before this Association, and I frequently perform it, especially on young children. I know of no form so well adapted to the deformities of the cartilaginous septum in young children as that described by Dr. Watson.

I should like to lay stress upon one point in the operation, and that is the freshening of the edges of the floor on the concave side after having performed the operation on the convex side. I find that having freshened the edges has aided materially in holding the part pushed over into the concavity. In packing, having in mind the suffering that the patient must experience in having the nose packed with solid gauze for four weeks, I use an Asch or Maver tube, which helps to keep the part well over, if it properly fits the nose.

The operation described by Dr. Watson has not been forgotten. When we sift the matter of septal operations we shall find that there is no single operation that is going to answer all purposes; that for the deformities or the condition that follow accident, and for the relief of external deformity, operations of this character will be done for time immemorial. That this is important we know; for very often we are consulted for the relief of external deformity occasioned by deflections, and no thought is given by the patient to the impaired breathing.

Dr. William E. Casselberry: It is a very useful operation. I have had frequent opportunity to test it and I had occasion last year to testify to its special suitability in children on whom I usually prefer to operate under general ether anesthesia, as it can be done quickly, efficiently, and without difficulty incidental to the recumbent position. But as I remember the operation, which has grown familiar to us under a hyphenated name, the incisions were made quite through the septum—including cutting through the muco-perichondrium of the concave side, and I have done it so, although exceptionally I have done it as I now understand Dr. Watson intends, cutting through the cartilage and only one muco-perichondrial covering.

Dr. Watson: By preference, I do so; but sometimes it is not possible to limit the incision.

Dr. Casselberry: My difficulty when incising but one side was that I could not make the lap lock; hence, finding it neces-

sary not only to incise quite thoroughly from side to side but also to extend the incision backward, even using a saw for the bone in order to push the convexity through to the concave side and have it remain there.

Also Dr. Watson tells us that if there proves to be sufficient thickening along the lower part of the horizontal cut to cause undue protrusion into the nostril of the convex side after the healing, it has to be subsequently sawed off just as a spur would be; but that means a second operation. I see no reason why the surplus bone or cartilage cannot be estimated and removed as the last step of a single operation, which is what I seek to do.

Dr. William L. Ballenger: I wish to speak favorably of this operation. I have often performed it in years past, and had the pleasure of performing it only a week ago with satisfactory results. My name has become connected with the submucous operation through the invention of a swivel knife, and the impression may have gone out that I am wedded to that operation to the exclusion of all others. I am not. I have frequently performed the Watson operation, the Asch operation, the Kyle operation, and others since inventing the swivel knife, and I think that probably in the future I shall do a larger proportion of these operations than I have in the recent past.

When one takes up a new operation he tries it in all sorts of cases. I have probably used the submucous resection in cases in which it would have been better to have used other measures. I think, with Dr. Watson, that when we can save the framework of the septum, it is best to do so. I had a slight sinking in of the nose about two months after a submucous resection, not having made due allowance for the chondritis that undoubtedly followed an early injury. In the class of cases described by Dr. Watson his operation is a very desirable one, and one that should be chosen for the purpose. I simply wanted to place myself in the proper light before this Association and not be misunderstood—although I do not know that I have been—as to my position on operations on the septum.

Dr. Robert C. Myles: I have never exactly understood from the history of these operations what the Watson operation was. Probably Dr. Watson will explain it to us. My understanding was that Dr. Watson never cuts through the mucous membrane on the other side. Dr. Gleason always did. There is a great difference between the two procedures. Dr. Asch's operation, also, was always confined to the cartilaginous septum. Many who used his operation performed another, in addition; that is, broke up the bony septum.

In 1896 I read a paper describing the Sub-Perichondrial Operations of the Nasal Cartilage, in which I described certain

results. So long as I confined myself to the cartilaginous septum, I had no trouble; but since I have performed operations on the deeper bones in connection with it I have occasionally gotten into temporary difficulties. I have heard of two deaths following the submucous operation. The deeper the operation on the bony septum, the more serious it becomes.

Does Dr. Watson perform his operation on the perpendicular plate of the ethmoid in such a manner as to relieve this apprehension? His operation is ideal in certain cases.

Dr. J. Solis Cohen: I have a great predilection for this operation, from which I have seen most excellent results. Dr. Gleason's operation includes a vertical incision behind and a large one in front, which makes it more extensive; then he puts in his finger and forcibly breaks the bone. I have seen serious cerebral trouble follow that procedure. When it did happen it gave a great deal of anxiety. Reference has not been made before in the discussion to the difference between the Watson and the Gleason operation. What is called the Gleason-Watson operation includes an additional vertical incision behind, as well as a larger vertical incision in front, so that the cut has a squared "U" shape. Sometimes a knife is used and sometimes a saw.

Dr. B. Alexander Randall (by invitation): If it is permissible for a visitor to venture a word, I think that there is a point that has great bearing upon this subject; and that is the marvelously straight piece of septal cartilage that we obtain after removing what was a markedly angulated cartilaginous portion. As soon as we have stripped off its mucous membrane, the cartilage straightens itself in a marvelously satisfactory manner. The operation as now presented by Dr. Watson, in laying stress upon the carrying out of the procedure without perforation of the mucous membrane upon the concave side, is virtually a submucous operation on that side; since there must be a considerable detachment of covering, so that the part shall slip over.

As I have understood the Gleason operation as contrasted with the Watson, Gleason is particular that there be a horse-shoe largely vertical, behind and in front of the deviation to overcome the resilience. He also rather avoids getting the flange, which is the pride of the Watson operation. If this point of the relatively submucous work of the Watson operation is borne in mind, we shall see why it is as satisfactory as it is.

Dr. Watson: I thank the members of the Association for the way in which they have received this second announcement of the operation. In answer to Dr. Mayer, in regard to freshen-

ing the base of the concave side, I would say that I think that is a good idea. Not cutting the mucous membrane of the concave side, however, accomplishes the same result. When the parts are pushed over, the muco-periosteum is stripped up from the base, allowing the cartilage of the other side to fall down between it and the bone of the base. That denudes that portion and allows the upper flap to adhere. This is one advantage of not cutting the mucous membrane; and another is that it keeps the other nostril free from blood. If there is any danger of a perforation following, this is also obviated largely by this mucous membrane being left intact.

I think that Dr. Cohen or some other speaker spoke of the Gleason method of doing this operation, mentioning the fact that it cuts the mucous membrane on the other side. I used to cut it through at first, and did not think of saving the mucous membrane on the concave side. This is a refinement of the operation, but I do not insist upon it. It makes a nicer operation.

Dr. Casselberry spoke of the spur removal. When I first did the operation, I removed the spur at the same time; and I sometimes do this still, when it is marked and constitutes a thick mass extending across the nostril. Occasionally you will find a case in which you are undecided as to how far to go; and in such cases it is better to let it remain and do the operation, if necessary, later. Sometimes it rounds itself off in healing, and it is not necessary to do another operation. In the thinner deflections, in which we have the hardest time to make the overlap stay overlapped, breaking the lower portion of the septum which is left and straightening it up will obviate the difficulty. It removes the projecting portion and increases the lapping of the parts.

Dr. Makuen: Why not remove the spur before the operation?

Dr. Watson: Because we want to utilize all the straight part of the septum. It is practically straight down to the angle; and all below is bone, at the suture between the vomer, the triangular cartilage, and the perpendicular plate of the ethmoid. We get the cartilage just above the bone, and do not have to use the saw. Occasionally there is a spicule of bone. The saw does not make a good operation, because it goes through in a straight line, and one cannot follow the irregularity of the angular overhang.

Dr. Mayer spoke about packing. I have used all kinds of splints and packing—the rubber tubing, molded gutta-percha, hard rubber splints, etc. The latter are not made for the particular nose upon which you are working, and are sometimes too large in front and too narrow behind. Therefore, I prefer

the gauze. I do not find it at all disagreeable to the patient—not so much so as a hard dressing. It slips in and out easily, and can be greased after the first dressing. It does not have to be tight. In the cases in which the results are the most successful, there is no necessity for any packing. There is a danger that the patient may blow his nose and displace the parts or hemorrhage may occur. I put the gauze in to avoid these dangers rather than to support the septum. Otherwise in most cases the parts would stay in position by themselves.

Dr. Myles spoke of deflection of the perpendicular plate of the ethmoid. This is one of the conditions which I excepted from this operation. I do not know of any better way to correct the deflection than to cut away the curved bone by the submucous operation.

Dr. Randall has said that Dr. Gleason, in doing the operation, does not make a bevel. He does not do this intentionally, perhaps, but he does do so; in sawing up he makes the bevel, which is a most important feature of the operation.

A PLEA FOR LOCAL ANAESTHESIA IN OPERATIONS ON THE MAXILLARY SINUS.

BY GORDON KING, M. D.

In resorting to surgical procedures for the relief of conditions which, in themselves, do not entail risk to the patient's life nor interfere so seriously with comfort as to render life burdensome, it becomes the prime duty of the surgeon to minimize in every way possible the risk to life incurred by the operation itself, consistent with analgesia, avoidance of shock and thoroughness of execution.

How doubly unfortunate does it seem when a fatality occurs from the use of a general anaesthetic in the performance of some simple operation for a minor ailment for which, if operation is essential for relief, a local anesthetic skillfully and judiciously employed would have been sufficient to prevent pain and at the same time would have been comparatively free from danger to life. Few of us but can recall to mind in the sphere of his observation or experience some catastrophe of this kind for which vain regrets offer but poor consolation.

Recognizing as we must the ever present danger in any general anaesthetic, and the impossibility to always foresee and prevent a possible accident, it is but just that every patient whom we are to subject to this danger, or those responsible for his welfare, should be made aware of it, however slight the risk may appear to be. Among the more intelligent we take it for granted that the risk is understood and accepted without discussion, but often the surgeon is anxiously interrogated as to any possible danger to be incurred, and in such instances it has always been my custom to express my opinion frankly, although regretting the undue anxiety this may cause. For these reasons and others of practical bearing I have within the past few years endeavored to restrict as much as was practicable my use of general anaesthetics and resorted more to local.

I have proved to my own satisfaction that in many cases in which formerly, either through precedent or habit, I relied upon general anaesthesia, I now can accomplish equally good results under local anaesthesia. Especially is this true of operations about the mouth and upper air passages, where, in addition to the danger from the anaesthetic we have to contend with the annoyance and delay incident to the nausea and vomiting, the inhalation of blood and secretions into the larynx, and the frequent interference with the administration of the anaesthetic. These annoyances so often hindered me in antrum operations, where more than half the time is occupied with the administration of the anaesthetic and delay caused by retching and the accumulation of blood and mucus in the throat, that I decided some time ago to try the efficacy of local anaesthesia. The result has been even more satisfactory than I anticipated, and for two years past I have used a local anaesthetic exclusively in these operations.

The antral region is peculiarly well adapted to local anaesthesia, and even the sting of the hypodermic needle can be obviated by a preliminary swabbing of the mucous membrane in the canine fossa with a 10 per cent. solution of cocaine.

Being still a loyal advocate of the Caldwell-Luc operation for antral empyema rebellious to the less radical treatment, I shall describe briefly the manner in which this operation can be performed practically without pain and in less than half the time required when a general anaesthetic is employed, including the first few minutes expended in benumbing the mucous membrane of the canine fossa by topical application, the entire procedure has on an average taken not more than seventeen to twenty minutes.

I begin by swabbing the mucous membrane briskly with a ten per cent. cocaine solution, then when the part is insensible to the prick of the needle a solution of cocaine (two per cent.) and adrenaline chloride (1:2,000) is injected along the line of incision, at first superficially into the submucous tissue and then more deeply into or under the periosteum. This done, the incision is made down to the bone and the periosteum elevated until the exact situation of the infra-orbital foramen can be made

cut, when, to insure more perfect and widespread anaesthesia, a few drops of the solution are injected into or around the trunk of the infra-orbital nerve at its point of exit. I find it more prudent not to lay bare the nerve itself, as this may lead to post-operative neuralgia or neuritis. Having exposed the bone to sufficient extent to permit of easy access to the antral cavity, the electric burr or a chisel is used to make a small opening through which several drops of ten per cent cocaine and some adrenaline are introduced into the cavity. To minimize the quantity of cocaine used I generally employ a cotton-tipped applicator to apply the solution thoroughly to the mucous lining of the cavity. This is the most sensitive area of the operative field and requires more thorough cocainization than the other parts. A few minutes time must be allowed the mucous membrane to absorb the anaesthetic, and this may be utilized in applying a pledget of cotton, saturated with the anaesthetic mixture, to the point under the inferior turbinate where the counter opening into the nose is to be made. The antral contents, including the diseased mucosa, is removed with curettes, the opening having been first enlarged to permit the easy introduction of the instruments.

This done, the counter nasal opening is made and the buccal wound sutured, while the soft parts are still insensible. The addition of adrenalin to the cocaine solution is an advantage in diminishing the flow of blood, which is often profuse, and perhaps in prolonging and intensifying the anaesthesia, while at the same time offsetting the toxic tendency. In none of my series of cases, numbering about fifteen, have any toxic effects been apparent, although three were over sixty years of age, and in one the heart was too weak to admit of general anaesthesia. Among them were some extremely neurotic and sensitive subjects, but all were satisfied with the result from the anaesthetic point of view. In two the radical operation on the frontal sinus was also performed under local anaesthesia, but the frontal region being more sensitive and less susceptible to thorough cocainization than the maxillary the result is not so satisfactory. Here also we do not have to contend with the secretions of the mouth, and the operator can continue his work uninterrupt-

edly while the general anaesthetic is being administered, which is, after all, the greatest hindrance to thorough and rapid operation on the maxillary sinus.

Discussion.

Dr. Robert C. Myles: In the last fifteen or twenty years I have operated on hundreds of cases for disease of the antrum of Highmore, and in the series of cases operated on eight or ten years ago, I do not believe that more than two per cent. of the operations were done under general anesthesia. All the rest were done by the local method. I used a two to a four per cent. solution then; but I have gradually diminished the strength until I have gotten it down to one-eighth or one-tenth of one per cent. The mucous membrane was thoroughly anaesthetized with the local use of cocaine and adrenalin; and this makes the operation practically painless, unless one strikes some dental nerve. I have tried some cases with water hypodermatically, and the result seemed to be good. This was due to the pressure of the water on the nerves.

Within the last few years I have done not more than ten per cent. of operations through the canine fossa; the others I have done through the inferior meatal wall. In that class of case we use the light platinum needle, introduced under the inferior turbinal or after a section of it has been taken off. It is well to introduce the cocaine and adrenalin through the small penetration hole in the antrum, for the most pain is in the antral mucosa. It is remarkable what an anesthetic condition is produced by so weak a hypodermic solution. With the strong topical solutions I have seldom noticed much constitutional effect. There is a great deal in the method employed. I do not believe in putting cocaine on a region upon which I do not intend to operate. To spray it in the nose diffusely or where it will discharge into the throat, will produce a much worse constitutional reaction with a weak solution than would be produced by using a strong solution on a small swab and not letting it flow out upon other spots. It should be held in the proper place with a small pledget of cotton.

So far, I have nothing to regret in the use of local anesthesia. I am a sort of chronic "knocker" on the question of the death rate from general anaesthesia.

Dr. William E. Casselberry: From a limited experience with mere local anaesthesia for the radical operation through the canine fossa, I can testify to the efficiency of local anesthesia. I have done the operation thus in the case of an old man to

whom I hesitated to give a general anaesthetic. It, however, took me considerably longer than Dr. King has stated, probably because I am not so experienced with the local anaesthesia method of radical antrum operating. The anesthesia was satisfactory, except in the curetting of the interior of the cavity, which was painful to the patient, notwithstanding the efforts I made to apply the cocaine within the cavity. I did not think of injecting the cocaine into the region of the infraorbital nerve, but I have no doubt that this is a useful addition to the technique.

Dr. Arthur A. Bliss: I should like to ask Dr. Myles whether that fatal case after general anaesthesia occurred after the use of ether or of chloroform. I have been very much impressed by his statement. It is astonishing how very rarely any of us have untoward experiences after the use of ether. I should be very much pleased to have him tell us what anaesthetic was employed.

Dr. Myles: I did not ask particularly concerning the details of the administration of the anaesthetic.

Dr. King: I should merely like to emphasize one point about this method. Not only is it a question of getting thoroughly efficient anaesthesia by means of cocaine, but the use of a local anesthetic also facilitates the operation. The greatest obstacle in doing these operations about the mouth with a general anaesthetic is the secretion, creating the necessity of repeatedly cleaning out the throat. The wound is constantly reinfected by the secretions. This is obviated by the use of local anaesthesia.

As to the time of the operation, which Dr. Casselberry spoke of I find that I can do it in half the time that it would take under general anaesthesia, because it does not take so long to give cocaine, and the rest of the operation can be done without stopping for further anaesthesia—except in the interior of the cavity, which is the most sensitive point. If you begin by making a little opening, it is not painful at all. Then, before you begin to open it up largely, you can inject a ten per cent. solution of cocaine. By the time you have it thoroughly opened the part is pretty well anaesthetized. If not, swab in a stronger solution on the interior surface of the cavity.

MYXOFIBROMA OF THE NASO-PHARYNX, CAUSING
DISFIGUREMENT; REPORT OF A CASE
AND EXHIBITION OF SPECIMEN.

BY D. BRADEN KYLE, M. D.

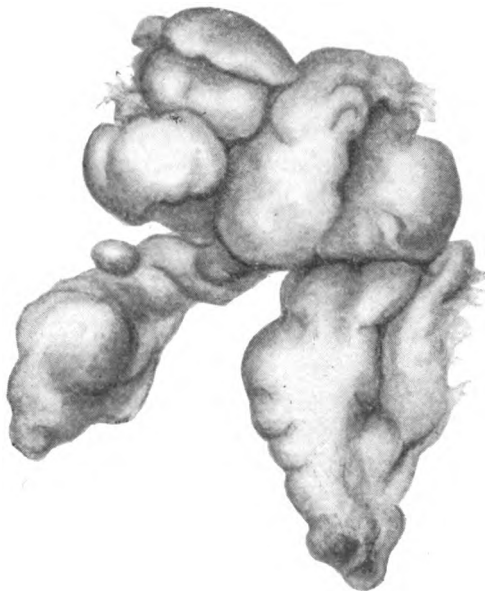
The etiology of fibromyxoma of the naso-pharynx is still somewhat speculative, but the pathology and site are well known. Simple fibromyxoma may spring from, and be located purely in, the naso-pharyngeal space. Its common site of origin is from the basilar process of the occipital bone, a location from which it slowly, but surely, spreads. There seems to be no law controlling the rate or direction of its growth. It may extend upward, producing displacement of bony structure to such an extent as to demand prompt and thorough surgical interference. On extending downward it may fill the naso-pharyngeal space and even involve the pharynx.

The symptoms will be controlled by the extent of the growth and the line of involvement. If the tendency is downward, there will be early impairment of the voice resonance, the sensation as of the presence of a body in the pharynx, causing continuous swallowing, sensitiveness of the surrounding parts, slight tendency to hemorrhage, and the individual will have a gaping appearance, owing to the necessitated mouth breathing. When the tumor extends downward, there will be interference with the normal faucial movements, owing to the obstruction and some partial paralysis from the pressure; there will also be loss of motion of the soft palate and uvula. If the growth extends upward and reaches sufficient size disfigurement of the adjacent structures may take place. There is usually persistent headache and a great feeling of pressure over the bridge of the nose. The morbid histology of the tumor in this location differs from that found in the nasal cavity only in the fact that there are more bundles of fibres and fewer individual stellate cells. This

is probably due to the fact that in the naso-pharynx and fauces there is more connective tissue present.

The common symptoms of a naso-pharyngeal growth of this size are inability to breathe through the nose, fullness in the head, with the characteristic nasal twang; difficulty in swallowing; choking sensations; deafness, and tinnitus.

The particular case which I wish to report and from which the specimen was removed, was a young man, aged 24 years,



Myxofibroma of the Naso-Pharynx.

who presented himself at the Out-Patient Department of the Jefferson Medical College Hospital, complaining of inability to breathe through his nose and of almost continuous pain or aching in the region of the frontal sinus or over the bridge of the nose. On the right side the tumor mass had extended so far forward as to almost protrude from the nostril. By the aid of the rhinoscope the mass in the naso-pharynx could be distinctly outlined, although it did not extend below the margin of the soft palate. There was considerable catarrhal discharge, but no associated symptoms evidencing any involvement of the accessory cavities or the ear. In other words, the symptoms

were all directed toward the point of pressure, the bridge of the nose at the inner corner of the right eye, where the distinct swelling stood out prominently. The right nostril was entirely occluded by the tumor mass, while the left nostril was occluded, owing to the septum having been deflected by the tumor.

After the removal of the tumor the external displacement and swelling entirely disappeared. I have seen a number of cases of myxofibroma, but this one, to me, was rather unique and I thought it worth reporting to you.

My object in reporting this case is to call attention to several interesting points. First, the site of origin of these pedunculated masses was at the posterior end and underneath the superior turbinated body. Second, as a rule the tumor extends downward into the naso-pharynx and in a number of cases which I have seen and operated upon the tumor or tumors were of sufficient size to cause pressure, displacement forward of the soft palate, and even extending below the margin of the soft palate. However, in this particular case only one of the tumor masses extended into the naso-pharynx, while the others turned forward and completely blocked the right nostril, and by their gradual increase in size had displaced the bony septum to the left, occluding the nostril. Third, the growths did not follow the line of least resistance. Fourth, there was practically no hemorrhage. Fifth, each tumor was pedunculated. Sixth, there was no involvement of the ear. Seventh, there was no evidence of sinus involvement except the pain, and this entirely disappeared after the removal of the tumor. The right nostril was entirely blocked by the new growth and there was marked disfigurement at the inner angle of the right eye. The patient suffered considerable pain only over the region of displacement and swelling. When the growths were removed the index finger, passed into the naso-pharynx, could be carried forward through this enormously dilated nostril. The bony septum seemed to have been softened by the pressure and inflammatory process, and was easily forced back into the median line by means of the nasal dilator and remained in position without the support of nasal splints.

The last time I examined the patient, some six weeks after

the operation, the nasal passages were in good condition and practically of equal size.

Discussion.

Dr. John W. Farlow: A symptom that occurred in a patient of mine and did not occur in Dr. Kyle's patient was extreme change in the voice. My patient was a man nearly 60 years of age; I enquired his name, which he said was Batson. I found his post-nasal space filled up with a growth, which was larger than the one from Dr. Kyle's case.

As soon as the growth was removed the man said: "You remember that you wrote my name down as Batson; my name is Matson. I have had this trouble two or three years, and since it began I have moved to another town. Where I formerly lived, everybody knew me as Matson; but where I now reside they all call me Batson. I am now Mr. Matson again." I was greatly surprised to find that, although there was still great weakness of the palate the character of the voice changed almost to normal immediately after the operation.

Dr. Gordon King: I simply want to mention a case of myxofibroma I removed recently. The tumor was about the size of a large pigeon egg and had occasioned considerable deformity of the face; and when it was removed I found it to have been attached by a pedicle to the alae of the nose. I mention it on account of its unusual point of origin.

Dr. William Lincoln: I recently saw a case similar to Dr. Kyle's, in hospital work, and I wish to bring out the point that all cases are not so favorable in regard to blood-vessel distribution. In mine, adhesions had taken place all over, and operation by means of intranasal snares and forceps was impossible. I had to remove the nose from the face and lay it over on one side, which permitted a free access to the tumor. The adhesions had to be separated with a spatula, and the cautery had to be used. It required a great deal of packing. I was glad that in removing the nose I had cut in upon the surface sound side, for when it was replaced upon the face the inevitable suppuration did not come through the wound, but was discharged into the pharynx. The tumor was not entirely removed in the naso-pharynx, but it afterward yielded to treatment by electrolysis.

Dr. Henry L. Swain: How firm was the tumor? It seems most unusual to have bony deformity from such a soft tumor as a myxofibroma.

Dr. John N. Mackenzie: Some years ago, at the University of Maryland, I had a large fibroma of the naso-pharynx, which

seemed to be rooted almost everywhere. I attempted to remove it with the cold wire snare, but broke three snares in the attempt. I broke practically every instrument I had and finally decided to pass it over to the Professor of Surgery. I did so and he did a modified Langenbeck, dissecting the growth out in that way. It was found that it would have been absolutely impossible to have removed it through the internal route. A very large artery was severed, but the hemorrhage was finally controlled.

This case proves the truth of what Dr. Lincoln has said, that these growths are sometimes impossible to remove through the internal passages because they are rooted in so many places. If I had severed this artery in removing the growth and had had the serious hemorrhage that followed, it would hardly have been possible to have controlled it.

Dr. William E. Casselberry: The discussion seems to have embraced two classes of growth: those we have heard about from the last speaker belong to the class of naso-pharyngeal fibroma, and those concerning which the paper was written are the oedematous fibromata or myxofibromata, which dip into the naso-pharynx. The two conditions should not be confused, because the treatment of one is entirely different from that of the other.

Dr. Mackenzie: I stated that my case was a pure fibroma.

Dr. Kyle: I did not refer particularly to the change of voice, but merely referred to it as the typical nasal twang.

In regard to the point made by Dr. Swain, these tumors are certainly very soft; and it has also puzzled me why such soft masses could cause so much bony displacement. Myxofibromata are not very vascular. There was practically no hemorrhage in this case.

The patient made a good recovery; but whether there will be any return I cannot say, as it has scarcely been six months since I removed the tumor. I have frequently removed larger growths from the naso-pharynx, but the fact that this soft growth grew forward and caused bony displacement and external deformity was rather unique.

A CASE OF EPITHELIOMA OF THE TONGUE; EARLY DIAGNOSIS; OPERATION; RECOVERY.

BY ROBERT C. MYLES, M. D.

Mr. X, aged 64, a patient of mine for many years, returned from Paris on October 13, 1906, with a history of having been annoyed for about six weeks with a sensitive spot on the left side of the tongue, about ten to twelve millimetres anterior to the point of insertion of the palato-glossus muscle. He reported that his medical adviser in Paris had stated that he considered it a transitory disturbance which should yield to local treatment. The patient had been under my care during the month of April, 1906, and I had had occasion to examine his mouth and throat frequently. At that time no symptoms were noticed by me or referred to this area by the patient.

When he consulted me on the 13th of October there was a small hard area on the side of the tongue at the above-mentioned point which had some neoplastic characteristics and a roughened surface. He had had some ugly sores in his mouth on different occasions in previous years which had puzzled his physicians but had finally yielded to treatment. While my instinctive sense compelled me to believe that the diseased condition was cancerous, I hesitated in my decision until I could eliminate any possibility of its being syphilitic, by giving large doses of potassium iodide, 80 grains, t. i. d. During the three weeks of iodide test, the inflammatory border around the central warty area diminished decidedly, but the neoplastic centre seemed to grow.

I urged removal of this portion of the tongue and the cervical lymphatics, and my decision was indorsed by Drs. W. B. Pritchard, J. A. Bodine, and Joseph A. Blake. I felt that I had lost valuable time by the iodide test, although I felt justified by the remembrance of a happy experience in the case of a man who had a very hard tumor in the base of his tongue which had all the general characteristics of an extensive carcinoma, involving the region from the epiglottis to both faucial tonsils. The patient had come to New York to consult a general surgeon, who referred him to me for an opinion. I reported

that if the case was malignant, it was, in my opinion, inoperable, and urged a trial of large doses of potassium iodide. The patient went home well in about six weeks and I understood that he expressed considerable anger because several of his home surgeons had made an appointment to remove the whole tongue, which he had preserved by skipping off to New York a brief time before the appointed hour.

On November 14 Dr. Bodine operated by first thoroughly dissecting out all the superficial and deep cervical glands, and also the submaxillary, salivary and lymphatic glands. Much of the connective tissue along the jugular vein and carotid arteries was excised in order that many of the undetectable small lymphatics might be removed. Then a section of the left half of the tongue was removed with a pair of heavy scissors. The incisions were made in healthy tissue at a distance of a half to three-quarters of an inch in every direction from the margin of the diseased area. It was necessary to sever the left palatoglossus muscle and the styloglossus-hyoglossus, lingualis and parts of genio-hyoglossus, which caused the tongue to curl upward near the tip and to fall backward on the epiglottis at the left base. The wound was sewed up and united partly by first intention. The patient made an uneventful recovery from the operation. The microscopical report from Dr. Jeffries is as follows:

The following are the findings for the examination of the tongue tissue removed from Mr. ———:

In the centre of the portion received was a depression about one centimetre in diameter. Sections from this area revealed a marked disturbance of the epithelium and a very early stage of a squamous-celled carcinoma. The penetration of the epithelial-like cells had apparently but begun, and the advancing margins were preceded by acute inflammatory infiltration. At no other point was cancer found, although practically the entire mass was sectioned, as per your suggestion. These various sections determined a slight amount of acute glossitis, and there was some little acute inflammation of the lingual glands. The parotid gland and lymph glands associated with it did not exhibit any metastasis, but both had some little acute inflammation.

The points of interest are the decision to operate early, the lucky concurrence of all the consultants and the patient in the advisability of an immediate and complete operation, and the thorough and skilful performance of the operation by Dr. Bodine.

I will report the progress of the case at some future meeting of this Society.

I present the microscopical slides for your inspection.

Discussion.

Dr. Joseph H. Bryan: I have been very much interested in malignant disease of the tongue, since I have had some very unfortunate cases. I reported two cases that have turned out badly, and a brief history of them may not be out of order.

In one, I discovered on the lateral border of the tongue an ulceration that had been in existence six months. All the doctors that had been consulted had considered it a stomach ulcer. The disease, however, had shown no tendency to subside, and I recognized the condition and sent the patient to London. There Mr. Butlin removed half the tongue and part of the floor of the mouth, and three weeks afterward, the cervical glands on the affected side. There was no glandular enlargement perceptible by palpation at the time of the operation on the tongue, and no malignancy was evident microscopically in the glands of the affected side after their removal.

The patient returned to this country, and did very well until the first of last March, when he discovered a small enlargement on the opposite side of the neck. Within two weeks after this, there was a very rapid development. Dr. Finney, who was called in, did a complete operation, and found an enormous mass at the junction of the carotid on the opposite side. The carotid and the jugular were thoroughly imbedded, and had to be excised. The man died of pneumonia forty-eight hours after the operation.

The second case was one in which the growth was at the base of the tongue, and was operated on by the Kocher method. Recurrence took place six or eight months afterward.

I have recently had a third case operated on, and the patient is now doing as well as possible in the circumstances.

Regarding early diagnosis, it seems to me that the fate of the patients depends upon the early recognition of the disease. It has been stated these cases should be recognized in the precancerous stage. Is there such a stage? Must we operate before we are convinced that the disease is malignant?

I do not believe that we can ever say that a patient is cured of malignant disease occurring in the upper air passages or the tongue until three or four years have passed since the operation.

Why the disease should occur on the opposite side is evident from the anatomy of the tongue. It is rich in lymphatics, the circulation of which the raphe is not sufficient to shut off. In discussing the case with Mr. Butlin he said that the glands on both sides ought to be excised, and that was also the opinion of Professor Kocher. The case operated on in England did so well that we felt that the man would survive. The patient recently operated on by Dr. Finney is, I believe, also doomed.

Dr. John N. Mackenzie: It is growing more evident that, in order to complete the tongue operation, the whole floor of the mouth must be excised.

Dr. Bryan: Mr. Butlin removed the whole floor of the mouth, deep down into the larynx.

Dr. George E. Shambaugh: The question has been developed in the discussion in regard to the recurrence of carcinoma, after its removal from the base of the tongue, in the glands on the opposite side of the neck. The opinion was expressed that this recurrence on the side opposite its original location shows that the separation which one finds between the two halves of the tongue is not a complete one but one which permits of lymphatics passing from one side of the tongue to the other. I think the explanation of this clinical fact is to be found in the way in which the development of the tongue takes place. It is only the anterior part of the tongue which develops from two lateral halves. The *radix linguae*, commonly referred to as the base of the tongue, that is, the part which is found posterior to the *circumvallate papillae*, develops independent of the two lateral halves which form the anterior part of the tongue. It develops as a single central mass, and there is no median division, as one finds in the anterior part of the tongue. This anatomical fact explains very readily how it is that a carcinoma located on one side of the tongue may involve the lymphatics on the opposite side of the neck.

Dr. Myles: I believe that my case should have been operated on ten weeks before. It is difficult to get the idea into the minds of the patients that an excision should be performed at once. If we could do this, we could more frequently report a cure.

Dr. Bryan has made the point of whether the pathologist is able to find evidence of the presence of malignant disease early enough to enable us to operate with the hope of cure. It seems to me that the microscopic evidence is there, and that the pathologist ought to increase his knowledge regarding incipient

cancerous growth. There must be a precancerous stage, and what are its characteristics? I have asked a number of pathologists, and none of them seemed to know. One said that he thought I had had unlimited bravery to urge the operation with the little evidence of malignancy that we had. The general appearance of the growth led me to believe it to be malignant. This did not consist so much in ulceration as in a peculiar hardness, which did not yield to the iodide.

I am not in favor of taking out pieces for microscopic examination. In this case, the pathologist examined thirty sections before he obtained the necessary evidence. It is however, a complete and perfect demonstration of the character of the growth. The man certainly would have lost his life. I do not say that he is cured now. The question is, Can we cause a few patients to recover. If we can cure a few we shall feel encouraged to operate on others.

OPHTHALMOLOGICAL MANIFESTATIONS OF
LATENT DISEASES OF THE NOSE AND
ITS ACCESSORY SINUSES; REPORT
OF ILLUSTRATIVE CASES.

BY FRANCIS R. PACKARD, M. D.

A review of the recent literature upon diseases of the accessory sinuses cannot fail to impress the reader with the increasing attention which is being paid to the ocular manifestations present in such conditions. Conversely, recent ophthalmological literature shows a correspondingly increased recognition on the part of ophthalmologists of the importance of a knowledge of the relations of sinus disease to eye trouble.

If the custom of combining the practice of otology with ophthalmology had continued there is no doubt that in view of the present important relationship between otology and rhinology the subject of the relation of intra-nasal disease to pathological conditions of the eyes would have attracted the attention it deserves at a much earlier date. Even now, although the subject is being agitated more and more, there are many oculists who seem to ignore its practical bearings in their daily work.

I desire to direct your attention to what I consider a very large and important class of cases in which *latent* diseases of the nose and accessory sinuses manifests itself by various ophthalmological phenomena. The series of cases which I herewith present have all occurred in my practice in conjunction with Dr. William Campbell Posey, of Philadelphia. Dr. Posey has already reported a number of them before various ophthalmological societies.¹

¹Some Ophthalmological Phases of the Diseases of the Accessory Sinuses of the Nose. Read by invitation before the Baltimore Ophthalmological Society, March 24, 1905.

The Ocular Symptoms of Affections of the Accessory Sinuses of the Nose. Read in the Section on Ophthalmology of the American Medical Association, at the fifty-sixth annual session, July, 1905.

The Accessory Sinuses of the Nose From an Ophthalmological Standpoint. Read by invitation before a conjoined meeting of the Maryland Ophthalmological and Rhinological and Laryngological Societies. February, 1907.

In none of the cases here reported, in which the ocular findings were of the most varied character, were the nasal symptoms marked enough to direct the patient's attention to his nose as the source of his trouble. Of course, every ophthalmologist and rhinologist is familiar with the cases of orbital cellulitis, due to infection from the ethmoidal cells, and the mechanical effects of the presence of pus in the frontal and ethmoidal sinuses or the antrum are also sufficiently familiar.

I believe, however, that there should be more active co-relation between the ophthalmologist and the rhinologist in order to insure the recognition of the class of latent cases of nasal trouble such as are herewith presented.

Posey classifies the ocular symptoms which may occur as the result of intra-nasal sinus disease under thirteen heads, as follows:

- Disturbances in Vision and the Visual Field.

- Changes in the Orbit.

- Affections of the Lachrymal Apparatus.

- Affections of the Lids.

- Affections of the Extraocular Muscles.

- Affections of the Conjunctiva.

- Affections of the Cornea.

- Pupillary Changes.

- Affections of the Uveal Tract.

- Cataracts.

- Reflections.

- Asthenopia.

- Headaches and Neuralgia.

As will be seen, the range of such pathological conditions is a large and important one, but to the mind of the rhinologist the chief importance of the groups of cases which I report lies in the fact that the ocular symptoms were in each instance the result of a hitherto unsuspected nasal pathological condition.

Case I. G. L. M., age 29 years, consulted Dr. Posey in September, 1902, because of pain over the left eye, which was worse in the morning but passed away as the day wore on. The pain over the eye was very severe and as it radiated into the back part of the eye it had led his physician to send the patient to see Dr. Posey. Dr. Posey found that there were

no ophthalmoscopic changes in either eye, and vision and the balance of the extraocular muscles were normal.

Dr. Posey referred him to me and upon examination I found a marked chronic hypertrophic rhinitis, with great obstruction to the outlets of the sinuses. After contracting the tissues with cocaine and adrenalin, I was able to get away a great deal of discharge from his ethmoidal and sphenoidal cells. Several repetitions of this treatment were followed by a rapid subsidence of pain and no further ocular phenomena manifested themselves.

Case II. Miss A. B. was seen by Dr. Posey on the 14th of September, 1904. His report of her condition at that time was as follows:

"Miss A. B. consulted me early in the Autumn, complaining of pain over the left eye, which was made worse by stooping over. The eye was described as feeling prominent and as being stiff in its socket. The ophthalmoscope revealed that the edges of the left optic nerve were everywhere hazy and that the blood vessels, especially the veins, were fuller and more tortuous than normal. Vision in the left eye equalled 5-6, that in the right 5-5. The difference in the vision in the eyes was, however, much accentuated by the use of the Bjerrum types, the vision of the left eye being particularly affected, indicating a marked diminution in the light sense of that eye."

Dr. Posey referred her to me, as she stated that she had had a cold in her head for several weeks previous, and there had been a slight discharge from her nose. I wrote him the following report upon her condition at that time:

"There is considerable muco-pus discharging from the left ethmoidal and sphenoidal regions, which pours over the surface of the swollen left middle turbinate and into the naso-pharynx. I have seldom seen much more marked unilateral congestion in these regions than is present in this case. On the right side, although there is a condition of chronic catarrhal rhinitis, there is comparatively little swelling of the tissues, and no acute congestion in the ethmoidal and sphenoidal region. The frontal sinus and antrum are apparently not at all involved in the process."

As her trouble seemed to be entirely dependent upon her intra-nasal condition, Dr. Posey relinquished her treatment to me. The intra-nasal condition soon subsided under local cleansing and the application of a mild solution of iodine and potas-

sium iodide. She still has a slight diminution in the light sense in the left eye.

Case III. H. L. S., a young man, consulted Dr. Posey on February 23, 1903. He had a herpetic keratitis of a dendriform type in his right eye, consecutive to an attack of grip. At that time he suffered from an acute ethmoiditis. In February, 1905, two years later, following another attack of grip, the right eye became re-inflamed, showing a corneal inflammation similar to that which had occurred two years previously. Dr. Posey referred him to me for examination. I found an acute purulent ethmoiditis in association with the ocular and nasal inflammation; there was a herpetic eruption over the infra-orbital branches of the fifth nerve of the affected side. After the removal of the right middle turbinate his intra-nasal and ocular symptoms were completely relieved.

Case IV. B. H. B., a young man of 22 years, consulted Dr. Posey in February, 1905. He stated that for three months he suffered from a heavy feeling in his head and attacks of dizziness and dull strained pain in the eyes, and some diplopia. Dr. Posey's examination was as follows:

"Ophthalmoscopic examination was negative; corrected vision was normal in both eyes. The upper lid of the left eye was cedematous. There was a left hyperphoria of 1° and an exophoria of 2° at the far point and of 8° at the near. Examination revealed a paresis of the left superior rectus muscle."

Upon examination of the nose I found a chronic catarrhal rhinitis with great hypertrophy of both middle turbinates, although at that time there was no pus in any of the sinuses; the cystic conditions of both middle turbinates and his history of frequent attacks of pain in his cheeks and forehead led me to suspect that he had probably suffered in the past from attacks of suppurative sinusitis. I removed the hypertrophied turbinates with the cold wire snare and bone forceps. Since that time he has had no further trouble.

Case V. Miss E. C. M. consulted Dr. Posey in September, 1906. She stated that she had been subject to dull pain in the left eye since the preceding Spring and had also some distress in the right eye. He reported:

"Examination revealed a distinct left optic neuritis, the retinal vessels being full and tortuous and the nerve edges somewhat obscured, with an associate choking of the lymphatics on the head of the nerve. The retinal veins in the right eye were fuller than normal; vision in the right eye was normal; that in the

left 5-6, the difference being more marked when the Bjerrum type was employed."

Dr. Posey referred Miss M. to me and I reported to him as follows:

"Miss M. has a very similar condition to Miss B. (Case 2), except that it is more chronic. There is a hypertrophy of both middle turbinates, especially marked on the left side. The left bulla ethmoidalis is much swollen. Transillumination of the sinuses revealed no indication of pus."

The condition is purely "catarrhal." In this case cauterization of the hypertrophied turbinates with chromic acid relieved her catarrhal symptoms and she has had no return of the eye pain.

Case VI. Mr. T. D. W., age 20 years, referred to me by Dr. Posey on January 12, 1907. He had suffered from frontal headaches for 18 months, which had been somewhat relieved by glasses prescribed by Dr. Posey about one year ago. He said that he was quite unconscious of ever having had any trouble with his nose. Dr. Posey sent him to me because upon examination he had found an optic neuritis upon the right side. Upon examination I found that the patient had marked hypertrophy of the right middle turbinate, the swollen tissues impinging upon a septal deflection to the right. The swollen turbinate was not cystic, but showed an ordinary hypertrophic condition. I shrunk the hypertrophied tissue with several applications of chromic acid. It was not feasible to operate upon the septal deflection, as the patient was upon the point of leaving the city.

I received the following report from Dr. Posey on March 18:

"T. D. W. is an interesting case of ocular changes from sinusitis. The treatment which you gave him in January relieved his head pain entirely. Ophthalmoscopic examination still shows, however, a low grade neuritis upon the right side, the nasal edges of the nerve being blurred and the central lymphatics full. Mr. W. has also quite a pronounced muscle error, the eye looking on a different vertical level and showing a slight tendency toward divergence. As the degree of the vertical insufficiency varies, I think it very probable that it is dependent in a great measure upon a hyperaemia of the orbital tissues."

Case VII. "Mr. N. B. W., aged 32 years, referred to me by Dr. Posey, January 10, 1907, with the accompanying report: The patient has an intense degree of hyperaemia and oedema of both optic nerves, more marked, however, upon the left side. The edges of the nerve are blurred, the retinal veins full and some-

what tortuous and the lymph passages along the walls of the retinal vessels are choked and distended. There is no intra-ocular cause for this appearance in the optic nerves, the retina and choroid being free from inflammation. The vision in both eyes is normal and there is no restriction in the visual field, either for form or color. The appearance of the nerves can, I think, be explained wholly by an interference in their circulation, due to pressure at the back of the eye, such as might be evoked by a sinusitis of either the posterior ethmoidal or sphenoidal cells."

On examination I found that Mr. W. had a cystic condition of both middle turbinates. On each side they were in close contact with the septum. He told me that he had not been conscious of any nasal trouble for some years, but that when seven years old he had had a shoe button removed from his left nostril, which he had placed there some three or four years previously.

For a number of years subsequent to its removal he had suffered from constant catarrhal manifestations, as stated above. These had for some years entirely disappeared. The patient was also very deaf in the left ear, the hearing being diminished about 1-24 normal for the watch. Hearing by bone conduction was much better in the left ear than in the right. The left membrana tympani was thickened and retracted.

He told me that for upward of a year he had suffered very considerably from frontal headaches. In a number of subsequent sittings I removed the cystic middle turbinates with forceps and cold wire snare. At the end of three weeks the patient left the city. During that time he had been comparatively free from headaches and declared that his nose felt so comfortable and clear that he must have been very uncomfortable before, although he was quite unconscious of it at the time.

Case VIII. Mrs. F. was referred to me by her family physician, Dr. Edward B. Hodge, on December 28, 1906. She had been a patient of Dr. Posey, who kindly furnished me with the following report of her case:

Mrs. F. first consulted me on April 10, 1906, being referred to me by her family physician, Dr. Edward B. Hodge, on account of supraorbital headaches. Both eyes presented but a moderate amount of far-sighted astigmatism, and the extra-ocular muscle was practically normal. She was given the proper

correcting glasses and her head symptoms were much relieved. On December 28, 1906, she returned, complaining of frontal pain. Examination revealed swelling and tortuosity of the retinal vessels, especially the veins. There was also a spasm of the ciliary muscles in both eyes. When account was taken of this latter factor, vision, however, was rendered normal and there was no restriction in the fields for either form or color.

This patient had a marked acute frontal sinusitis, worse upon the left side, both of the middle turbinates were hypertrophic and cystic. After their ablation with the snare and forceps, her frontal sinusitis cleared up and she has had no return of her headaches.

Case IX. Mr. W. P., referred to me by Dr. Posey in December, 1906, suffered from frontal headaches and pain in the eyes. Dr. Posey reported the case to me as follows:

"The ocular symptoms in Mr. W. P.'s case consisted in enlargement of the follicles in the retro-tarsal folds of the conjunctiva of each eye, together with an overfulness of the retinal veins. There was also more muscular asthenopia than could be accounted for by his refraction and muscular error, leading me to seek for other causes to explain his symptoms."

In this case there was a very marked ethmoiditis, which subsided under a bland spray and the application of adrenalin and eucaïne to the swollen tissues. After the acute condition had subsided I cauterized the hypertrophied middle turbinates, which caused rapid disappearance of the symptoms.

There have been several recent American contributions to this subject; among them I would direct particular attention to the paper of Dr. Hill Hasting (*Annals of Otology, Rhinology and Laryngology*. Sept. 1906). In it Dr. Hastings reports several cases very similar in their details to those reported by me.

T. H. Halsted (*Transactions Amer. Laryn., Rhinol. and Otol. Society*, 1901) reports an interesting case of sudden blindness due to damming up of pus in the sphenoid sinuses.

At the same meeting Hoople (*Transactions Amer. Laryn., Rhinol. and Otol. Society*, 1901) presented a paper in which he stated that pressure upon the middle turbinate, whether from hypertrophy of the middle turbinate, or from a septal spur

or deflection, is a very frequent cause of trouble with the ocular muscles.

Dr. C. R. Holmes (Ohio State Med. Journal, Feb. 1906) last year published a long and exhaustive article on the ophthalmological complications of intra-nasal disease in which he reports many interesting cases bearing upon this aspect of the subject.

Discussion.

Dr. Joseph H. Bryan: I have been very much interested in this paper, and am delighted to find that the eye, in relation to disease of the accessory cavities, is commencing to receive consideration. It has been my practice always to have an examination of the eye made by a competent oculist. I have had some of the most remarkable complications shown in the eye itself. In a paper read before the American Medical Association, I detailed some very interesting cases: sphenoid cases resulting in paralysis of the external recti and scotomata; narrowing of the visual fields, and pressure, causing bulging of the eye in various directions. They all showed that the eye, from the diagnostic standpoint, is a most important thing, and if men interested in the subject of the accessory sinuses will submit the patients to a thorough ophthalmological examination, they will often find the result of this examination a great aid only in those cases in which the disease is well marked, but even in those in which it is merely suspected.

Dr. George A. Leland: I do not think that Dr. Packard has any need to apologize for having read this paper, for within a comparatively few years it has been found that many troubles of the eyes are largely dependent upon varying intra-nasal pressure; not always where the accessory sinuses are diseased, but also in cases in which there is malposition of the septum or of the turbinal bodies.

In my limited experience I have come to believe in three cardinal eye symptoms that point directly to intra-nasal conditions for their origin. The first is astigmatism against the rule. It is possible that this may be due to spasmodic, forceful closure of the eyelids, an almost involuntary motion caused by the pain, but it seems as a rule to be purely a reflex.

Second, an irritable ciliary reflex. This has occurred in my practice quite a number of times, when the oculist has fitted many different kinds of glasses. In one case was fitted seven different lenses to correct a refractive error that varied with different degrees of intra-nasal pressure. With the galvano-

cautery the cushions of the septum were reduced, and for several years now the patient has required no glasses at all, and has had none of her old headaches.

The third symptom is a narrowing of the color field. This is not so common as the other two, perhaps because it is less often mentioned by the patient or sought for by the examiner. One lady had been an invalid from the age of ten or twelve years to that of fifty, all on account of her eyes. The color field was so much diminished that when she looked at her Italian garden it appeared to her as if she were looking at it through a hole in a board. After the intra-nasal pressure was removed, the whole garden came into view. On this case I will beg your indulgence and just read from a summary which Dr. H. H. Haskell sent me in a letter, and which will bring out clearly some points in these cases in which the eye is affected so much by the nose. "It is a good thing for us to find out from the rhinologist confirmation of our point of view that so much of the trouble in the eyes is due to the nose. When this is generally realized we shall have less people having defective eyesight.

"This is the case of a lady who began to suffer at the age of ten or twelve years, and had to stay in a darkened room for two or three days of every week or fortnight on account of the terrible headache that prevented her from reading, looking at pictures or conversing with other persons. The pain, tension, and lowered vision and the contracted field included all the symptoms of glaucoma except the cupping of the disk. They were all temporarily relieved by the use of pilocarpin, etc. There has been no recurrence since the intra-nasal contacts have been done away with."

She was first operated on in March, 1898, by cauterizing, shrinking, the middle and lower turbinates where they came into contacts. This had to be repeated several times until finally I gave up in despair of being able to do anything without removing both middle turbinates."

Again quoting: "Another thing peculiar about the case was that pain in the left side of the head sometimes appeared after an operation on the right side. There was myopic astigmatism, the amount of which varied in the right through an arc of 90°, and in the left through 25°. These variations were most marked after operations on the nose or when pressure in the nose was increased by swollen turbinates. The refractive error of the right eye disappeared entirely, so that the axis came just where it should be, and that of the left diminished 25°. She was last seen more than three years after the last operation and had remained quiet ever since. The extremely neurasthenic condition found in many of these cases is very much relieved after the operation. This patient became so much improved that she

often forgot herself and read or wrote for a long time. Once she numbered all the checks in a check-book, and had no trouble resulting."

I think we have this paper in good time. In fact, it is too timely for me, because I intended to write on the subject, and Dr. Packard has removed some of the wind from my sails.

Dr. Lewis A. Coffin: I want to congratulate Dr. Packard on being so early in the field. I am rather chagrined that I have been working for so many years in an institution in which we treat both of these specialties, and yet the relation between them has not been appreciated. At a meeting of the Section of Laryngology of the Academy of Medicine last Winter Dr. Posey read a paper on the subject. In the discussion that followed nearly all the laryngologists were rather opposed to admitting the relationship, and I stated then that we had come to recognize the relation between the nasal and aural disease largely through our patients, who, without solicitation, had informed us that after a certain amount of work done on the nose, the ears had improved and we had been forced to appreciate the relationship. I had never, however, had patients speak of the improvement of eye symptoms after nasal or sinus work.

It was not a week after this meeting that a patient upon whom I had lately operated for sinus disease voluntarily said to me: "Doctor, I am now able to lay aside my glasses." He is still getting along without them. We often find in sinus work that certain ocular conditions clear up after the removal of the pressure. Dr. Packard was so rapid in reporting his cases that I am unable to comment on them, but I wish to say now that I am a convert to the belief in the relationship alluded to in this paper.

Dr. John W. Farlow. Speaking of Dr. Packard's being one of the first in the field, I should like to call attention to a paper on a similar subject, written by Dr. Sluder, of St. Louis, which appeared in an ophthalmological journal several years ago.

Dr. Harris P. Mosher: So far as I know ptosis is a rather unusual symptom of the latent disease of the frontal sinus. I had it occur in one patient twice, first on the left side in connection with acute trouble in the frontal sinus, and second, a year later, on the right side, in connection with acute trouble with the ethmoidal labyrinth. If any one has had a similar case I should like to hear of it. A few cases are in the literature.

In many cases of unexplained trouble with vision the cause lies in the ethmoidal region or in the accessory sinuses. In such cases the X-ray plate will locate the fundamental trouble. Frequently there are no signs in the nose, so that in unexplained eye cases the X-ray plate should be used as a routine.

Dr. William L. Ballenger: I wish to say for the information

of some of our Fellows who do not seem to know the literature of the subject that the relation of the eye to sinus disease has long been recognized. Dr. Fish of Chicago, Ziem, and a dozen other writers have called attention to it. The eye symptoms as named in Dr. Packard's paper have been known to be associated with sinus disease for a long time. Dr. Coffin spoke of Dr. Packard as a pioneer. I do not wish to rob him of this honor, but I wish merely to remark that the subject has been long written on.

Dr. Coffin: I know that as well as Dr. Ballenger does.

Dr. Leland: The paper of Drs. Ewing and Sluder which Dr. Farlow has referred to, was very instructive to me. Two years ago I had the very profitable pleasure of going to Dr. Sluder's office by his kind invitation and looking over his valuable collection of specimens and of seeing some of the patients on whom he had operated with the greatest success. By these preparations he clearly demonstrated to me how a swollen ethmoid cell or bulla or uncinat process could exert painful pressure on the middle turbinate which by its continuance and the abundant nervous connection might give rise to all sorts of anterior headaches. And let me add that all these important abnormalities can now be brought directly into view by the use of Prof. Killian's long nasal specula.

I am glad Dr. Sluder is present to-day, and I wish to give him full credit.

Dr. Packard: I wish to say that I had no intention of claiming to be a pioneer. I have not gone into the literature of the subject in this paper because it is so extensive. I merely wanted to present the findings of the ophthalmologist in a definite series of cases to rhinologists. The cases were all latent, none having presented manifest nasal symptoms, and I thought it interesting to know just what an oculist had found in his examination in such cases.

SOME CONSIDERATIONS RELATIVE TO SYSTEMIC INFECTION THROUGH THE TONSILLAR RING.

BY JOSEPH L. GOODALE, M. D.

At the meeting of our Association last year I presented some suggestions with regard to the examination of the throat in chronic systemic infections. The special points covered by this paper were the pathological alterations in the faucial tonsils which induced or permitted infection of the system by pathological micro-organisms. During the past year work has been carried on along these lines, and a number of matters have suggested themselves to me, which I shall present to you for your consideration and discussion.

The histological unity existing between the faucial tonsils and the lymphoid follicles of the posterior pharyngeal wall and of the pillars is well known to you all. You cannot fail to have been struck by conditions of acute infection from pyogenic micro-organisms, limited to the pharyngeal follicles in the absence of inflammation of the tonsils. Furthermore, we have, all of us, I suppose, encountered cases where we have with care extirpated faucial and pharyngeal tonsils, and nevertheless the individual has experienced sore throat subsequently, with varying degree of frequency and severity. It is my belief that the responsibility with which we have charged the tonsils in the etiology of acute infection, should be shared in many cases by or wholly assigned to the lymphoid structures in the vicinity. Furthermore, while we have in the past been pursuing with painstaking care our examination of infections arising through the throat, disproportionate emphasis has been laid upon the pathological alterations of the tissues of the throat, in comparison with the receptivity of the host. At a time when the study of opsonins is being undertaken in all our pathological laboratories, this seems a particularly favorable moment to

direct your attention to the part played by the system in resisting invasion by micro-organisms.

At the last meeting of our Association I referred to several instances of infectious arthritis, where extirpations of the tonsils had been followed by marked relief in the joint symptoms. I have not reported these cases in detail, since such a report will be given later by the orthopaedic surgeon. In the last twelve months numerous cases have been examined with regard to the possibility of the throat being an entrance point for the rheumatic infection, and in a certain number of these cases the history of the affection and the appearance of the throat seem to justify extirpation of the tonsils. While a certain number of these operations have been followed by improvement from the orthopaedic point of view, I have seen at least one case where a continuance of the joint inflammation was observed in association with symptoms in the throat. This case seems to be of sufficient interest to report from the standpoint of a laryngologist.

The patient, a man forty-five years of age, was seen in December, 1905, with a history of recurrent attacks of rheumatism, beginning three years previously, each attack being ushered in by soreness in the throat. The inflammation of the joints was followed by progressively increasing stiffness, so that at the time of my first examination walking and movement with the arms were performed with difficulty. The tonsils were moderately enlarged, the right showing several large crypts containing much cheesy detritus. The right showed crypts in general smaller, which, however, contained a considerable amount of whitish, bad-smelling material.—I removed the tonsils completely at this time. Examination of the excised tissue showed conditions which I have elsewhere previously described, consisting in general of irregular contractions of the organs with dilatation of the crypts at their base and narrowing of their orifices. Convalescence from the operation was slow but otherwise uneventful, and during the remainder of the Winter and Spring marked improvement was apparent in the joint symptoms, so that the individual was able to walk much more freely than before. During the following Summer attacks of rheumatism again appeared in association with recurrence of soreness in the throat. Examination then showed a small pocket behind the site of the left tonsil, formed by adhesion between the posterior pillar and remains of the tonsillar fold left from the operation, containing much cheesy detritus. This

pocket was incised several times until it remained open. During the following three months the throat remained in a comfortable condition, and no exacerbation of the arthritis was noted. In January the throat again became sore, and acute inflammation was noted in several joints. Examination of the throat now showed marked reddening and swelling of the lymphoid tissue behind the left posterior pillar, which persisted for several days and disappeared with an improvement in the joint pains. In February another attack of soreness in the throat was noted, with fresh exacerbation of joint symptoms. Examination of the throat now showed swelling of several lymph follicles on the left side of the pharynx, one of them exhibiting a white spot in its centre corresponding to the crypt or central invagination of the follicle. This was treated by applications of silver nitrate, which the patient applied himself at home daily. Improvement in the throat and acute joint symptoms followed rapidly. At the present time the patient is making daily applications of silver nitrate in an eight per cent solution to the pharyngeal granules and for a period of eight weeks has experienced no soreness of the throat or exacerbation of his joint symptoms. It may be said that in general the condition of his joints is not essentially different from that manifest about a year ago at this time. What improvement has been noted may be fairly attributed, I think, to orthopaedic treatment. From the history of this case it seems reasonable to draw the following conclusions:

If we grant that a form of arthritis exists due to infection by one or more micro-organisms we are impelled to seek for the point of infection, and experience has shown that it is probable in certain cases that an infection atrium exists in the throat. Our knowledge of the pathology of the faucial tonsils would render it probable on theoretical grounds that these structures constitute the most frequent portal of entry of all the pharyngeal tissues. This hypothesis has been confirmed by the post-operative results of a certain percentage of cases. In the history which I have just reported there seems a reasonable ground for assuming that after extirpation of the tonsils infection of the joints occurred through the lymphoid structures of the posterior pharyngeal wall. Such a hypothesis is strengthened by our knowledge of the different forms under which acute pyogenic infections of the throat may occur. It is a familiar experience to us all to encounter cases of acute pharyngitis, characterized by reddening and swelling of the pharyngeal follicles in the absence of inflammatory manifesta-

tions in the faucial tonsils. In severe instances each follicle may exhibit a small central white spot at the summit of its convexity corresponding to its central invagination or follicular crypt. While we have no data in regard to the histological phenomena involved in such an infection, yet it seems fair to transfer to these conditions our relatively exact information concerning acute lacunar tonsillitis. Here, as you know, a development of pathogenic bacteria takes place in the crypts of the tonsils, with formation of toxine, which is absorbed into the tonsillar tissues. Through the chemotactic properties of the toxine, emigration of leucocytes occurs from the blood vessels of the vicinity into the crypts. These leucocytes, together with desquamated epithelial cells, constitute the white spots seen in simple acute proliferative tonsillitis. Where the bacterial toxine is stronger coagulation of the albumen in the superficial tissues of the crypts occurs, with formation of fibrin, as a result of which the area of white about the lacuna is widened.

As shown by Theobald Smith in the case of animals, tuberculous infection may occur through normal mucous membrane without leaving any trace of its penetration discoverable by the naked eye or by manipulation. Jonathan Wright has reported a case of penetration of the laryngeal mucous membrane by the bacilli of tuberculosis. In several of the cases of tuberculous cervical adenitis which I reported to you last year the tonsils were of normal clinical appearance, and yet either showed tubercle bacilli in their interior or when inoculated into guinea pigs produced tuberculosis in the animal.

In certain individuals whose tonsils have been extirpated manifestations of acute follicular pharyngitis have occurred with as great frequency as before the operation, and it seems reasonable to suppose that the cause of frequent bacterial invasions in such individuals was not primarily attributable to a faulty disposition of his lymphoid elements so much as to a predisposition to such infection on the part of the individual himself.

These facts seem, therefore, to render necessary an enlargement or modification of our previous conceptions as to the role played by the tonsils in the etiology of acute systemic infections. While experience has shown that the faucial tonsils are the most vulnerable point of entrance for micro-organisms,

and while certain previous pathological alterations in these structures favor such infections, yet we are nevertheless impelled to believe that normal lymphoid tissue presents no barrier. Such a belief brings us very directly to a consideration of the part played by the host itself in relation to the pathogenic micro-organisms.

Our conceptions of this subject have been recently greatly extended by the work done by Wright and others in regard to opsonins and their role in immunity or immunization. When now we are called and given a case to examine the throat as its constituting an entrance point for infection, it is of importance to consider not alone the pathological alterations in the tonsils which may be encountered but also evidence of change in the lymphoid tissue in the vicinity. Furthermore, even if such structures are found on inspection clinically normal, we are not thereby able to say that they have not been in the past points of entrance for micro-organisms. Of chief importance under such circumstances is the history of the case. If the individual has in his previous attacks of systemic disease experienced coincident disturbances in the throat this fact becomes of great importance. If it is possible to test the opsonic index of the individual with reference to the micro-organisms suspected of etiological relation which have been recovered from the throat, confirmatory evidence would thereby be obtained.

Discussion.

Dr. William E. Casselberry: I am very glad indeed that Dr. Goodale has drawn attention to the lymphoid tissue in what I had been accustomed to term the lateral angles of the pharynx. Of course, isolated follicles also exist all over the posterior pharyngeal wall; but especially behind the posterior faucial pillars there is a chain of lymphoid follicles grouped closely together and liable to acute infection. They are also frequently found chronically hypertrophied, and are then still more susceptible to acute infection. This chronic hypertrophy of the lymphoid glands behind the palato-pharyngeal fold may attain the thickness of a pencil and simulate an annex to the tonsil. I have also discerned that infection of this chain of lymphoid glands is, in part, responsible for the systemic toxæmia known under the name of acute rheumatism, acute endocarditis, etc.; because I have observed that in certain children and adults those

who are particularly prone to lymphoid infection and upon whom I had made a thorough tonsillectomy, there would subsequently occur, perhaps, acute attacks of lighter degree, and I would find this lymphoid tissue in the pharyngeal angles in a state of acute inflammation, so called pharyngitis lateralis. In such cases I have sought to destroy these glands by the electrocautery, as it is a surface not well adapted to excision, but adapted to cauterization. By using a wire loop electrode properly bent one can apply it behind the posterior pillar, reaching above the velum and down into the laryngo-pharynx and so destroy the whole chain of glands.

Dr. Robert C. Myles: This is a subject in which I am particularly interested, and I feel very much indebted to Dr. Goodale for the light that he has given me. I do not know why we have written and talked and thought so much about the tonsils and the systemic infection occurring through them and have been so slow to systematize our evidence. This refers not only to the specialist but also to the general practitioner and the pediatricist, especially in regard to different varieties of tonsillar affections. For instance, we may have the cervical glands deep behind the tonsils. I do not believe the average children's specialist keeps a record of the septic glands to be found in children's necks. If a septic gland were found in any other part of the body a record would be made of it and the cause of the infection would be removed. The tonsil usually noticed by the specialist is the tonsil that protrudes into the lumen of the throat, but other kinds may be just as dangerous. The crypts go down deep, and there the chief sepsis occurs on account of retention and of the moderate amount of epithelium. By properly examining the cervical glands one should be able to state the pathology of the tonsils without looking in the throat. I usually examine these glands before examining the throat. The pathology of the throat has, in each instance, confirmed the diagnosis made by the size and condition of the cervical glands. The tonsillar affection if of long duration will make the glands hard. It depends upon the length of time the condition has existed as to how firm they will be found to be. In proportion to their softness the glands are likely to disappear; in proportion to their hardness the opposite.

Twenty per cent of tonsillar affections are of the pedunculated variety, while eighty per cent are more or less of the palatal type. The large palatal tonsil, with its capsule, should not, in my opinion, be entirely removed, and its complete extirpation with capsule should not be attempted without serious provocation. When I hear of thorough extirpation of these tonsils, including capsules, I feel skeptical. Others claim to do so, but I have never been able to remove those which extend three-

quarters of an inch into the palate without producing some form of undesirable cervical sepsis, and, in some cases, edema, which extended to the zygomatic arch. When the palatal tonsil extends to this depth it is better to remove the pharyngeal and superficial parts of the tonsil and capsule, and the deeper central section of the tonsil, then invert or involute the deep parts of the capsule and remove the adherent tonsil masses with the alligator forceps devised by myself many years since. The adenoid region, in my opinion, causes adenitis in the post-cervical region. This is evidenced by little dots feeling like small buck-shot.

As I have stated in the beginning, it is the rule to have this evidence of sepsis without looking at the tonsil, and if it were in any other part of the body the surgeon or physician would notice it. Being, however, so common, it is practically ignored. I have noticed that these glands disappear in proportion to the betterment in the condition of the lymphoid tissue following operation, and I have noticed in many cases the after pathology of these glands in regard to the growth or disappearance of the pathological phenomena. It is a very interesting subject. We should report the ratio of the amount of adenitis cervicis to the amount of tonsillitis, and I would urge upon the physician to take cognizance of the amount of sepsis in the cervical glands.

Dr. George L. Richards: With reference to adenitis cervicis, do you find tuberculosis to be usually the cause?

Dr. Myles: In a series of cases on which general surgeons in New York City have operated for cervical glands I have insisted that at the same operation I should dissect out approximately all the tonsillar lymphoid tissue in the throat. Every one of these patients is to-day in splendid health.

Dr. Richards: In other words, the glands were universally tuberculous?

Dr. Myles: It was very difficult to determine as to the causal germ. Adler and other able pathologists are coming over to the idea that these cases are instances of direct infection through the lymphoid ring of the throat. One should involute these basic tonsils and remove the tonsillar tissue as thoroughly as may be expedient, and when this is finished there is an unsightly hole, but a part of the basic capsule is left in. They often develop in the shape of a tumor of the palate.

Dr. Francis R. Packard: I had a case that seems instructive in this respect. The patient, a child previously healthy, had a sore throat last September. He had no previous illness, except whooping-cough. Following the attack of sore throat a large, hard cervical gland developed on the right side. The child was brought to see me last January. He had a pair of big tonsils, which I took out. They were very adherent and very difficult

to remove. Their removal had no effect on the swollen gland on the right side. In March Dr. R. G. Le Conte removed the gland by external operation and examined it microscopically. He found it tuberculous. There was no other evidence of tuberculosis in the child. The tuberculin reaction has recently been tried, but I have not yet heard the result.

Dr. Richards: I have had some experience with this rheumatic condition. A woman of forty-five, with almost no tonsil, has, two or three times a year, a severe systemic infection in the throat, complaining severely of pain along the adenoid region—or where the adenoid deposit would be if she had any. There are probably some remnants of the glands adherent to the thickened pillars, showing the transference of the poison through the lymphatic ring. This patient has been operated on by the general surgeon for all sorts of complaints. A good many of these cases which, perhaps, are handled by the general practitioner, have more of the source of the trouble in the throat than we have yet appreciated. Some of them do not present much evidence in the throat in the intervals between the attacks, even on careful examination by drawing the anterior and posterior pillars forward and lifting up the arch of the palate, yet when the attack comes on they have a severe systemic infection with its local point in the throat. The only cure seems to be to remove in the interval every portion of lymphoid tissue that can be found.

With reference to the cervical glands, I do not know whether Dr. Myles understood my question. I wanted to know whether the enlarged lymphatic glands in children are not almost entirely tuberculous. I have operated upon such glands and have afterward had them examined by the pathologist. Sometimes tubercle bacilli are found and sometimes not. In an Association like this, composed of men who regard themselves as laryngological surgeons, why should we advocate turning such cases over to the general surgeon? If we are competent to work in the nose and throat and remove the tonsils we ought ourselves to be able to remove cervical glands. We are the only persons who can induce the family of the patient to have such glands removed. I have been endeavoring to get my patients to let me clean out the cervical chain as well as enucleate the tonsil.

Dr. Francke H. Bosworth: By a curiously persistent habit, but one which I regard as largely adventitious, the lymphatics in the fauces which are so frequently the seat of hypertrophic changes, in these changes develop in the form of invagination, forming deep pockets, or lacunae. This morbid formation, was so common that the old anatomists described it as a normal organ of the body, and this error has survived to our

day. These lacunae constitute mechanical traps by which the diseased germs are arrested and subsequently make their way into the system.

If this view is correct, and certainly it is one which, from a clinical point of view we are most safe in adopting in the interest of the patient, then the indications for treatment are very clear, and they are to remove the mechanical conditions which make the so-called tonsil a germ-trap; in other words, remove all of the mass which contains these lacunae.

I do not believe that the hypertrophied lymphatics are a menace in themselves unless they are in a sufficiently large mass to constitute a mechanical obstruction, or unless they are filled with lacunae by which the germs are arrested.

Dr. Frederic C. Cobb: I want to thank Dr. Bosworth for his remarks. It also seems to me very unlikely that we should have a tonsillar ring without any object. It is absurd to believe that we should have a mechanism for the sole purpose of absorbing bacteria in our throats. Therefore, the pathological retention by pockets or anything that tends to obstruct the flow from the tonsils will do more to cause trouble than will the tonsil or the lymphoid tissue. Is it not possible that the lymphoid tissue is a protector, and that the glands in other localities are also for the purpose of protecting against micro-organisms? They hold pathological material in the glands for some time, attempting to destroy it. Sometimes they succeed; but sometimes they are overcome and the germs get into the general circulation. It seems to me that it is a mistake to think that one should obliterate apparently normal tissue, simply on the evidence that through it pathological organisms occasionally reach the circulation. It appears quite possible and more than likely that these get in, not on account of the presence of the ring, but in spite of it. If we were to inject one-hundredth part of the bacteria present in acute tonsillitis into the circulation, the result would be septic fever. There is very little sepsis in acute tonsillitis. There is some for a day or two, and then it is relieved. Does not this mean that the tonsil has been able to take care of an enormous number of bacteria and to fight against them instead of serving as a sieve to admit them? If this enormous number of germs had reached the circulation should we not have had a great deal more sepsis?

Dr. Emil Mayer: I am very glad to see this subject brought up, as I recall that within the year Jacobi has published an article taking an entirely different standpoint from that which we have all accepted—that there is a direct infection beginning with the lymphatics of the throat. His standpoint at that time was so different from what I had believed that I am glad to

have an opportunity to hear the matter discussed. I note the presence with us of the President of the Triennial Congress and if Dr. Fitz has any observations of his own to present we should be happy to know what his views are regarding infection through the tonsils.

Dr. Reginald H. Fitz, President of the Triennial Congress: The general practitioner, so far as the relation of the tonsil to the infection is concerned, is usually more interested in acute articular rheumatism than in any other disease. It seems that, whatever the tonsil may do in some infections, it does not do the same in all. The particular characteristics of one organism, in which it differs from another, may allow of its passing through the tonsil. The remarks we have just heard were to the effect that in the tonsil we have a sufficient guard against certain abnormal infections. I do not know whether the result of extirpation of the tonsil has been determined with regard to its bearing upon cases of multiple arthritis. It seems a very interesting point for those with large experience to study. The infections occurring after the removal of the tonsils should be investigated in relation to those occurring before removal.

Dr. Myles: Dr. Richards asked me a question regarding tuberculous glands of the neck. I did not wish to say that I advocate the removal of lymphatics when they are protective but only when they are suppurating. In regard to having such operations done by the general surgeon, I would state that these patients were not brought to the general surgeon only by me, but were brought to me sometimes by the general surgeon.

Dr. John N. Mackenzie: Many years ago Austin Flint was conducting an examination in physiology at the Bellevue Hospital Medical School in New York. Among the students who came up for graduation was a bright young fellow to whom Flint propounded the following conundrum: "What is the function of the spleen?" And the lad replied that the function of the spleen was to enlarge in malarial fever. To the next question: "What is the function of the tonsil?" The boy declared that the mission of the tonsil was to swell and suppurate in quinsy. "That will do," said Flint, "you have passed a perfect examination, for you know as much about the subject as I do myself." Long before, a distinguished medical luminary on the other side of the Atlantic had said that were he, like Frankenstein, to attempt the artificial construction of a man, he would leave the tonsils out. In other words, at that period, or, as a matter of fact, from a period as long back as memory can run, the tonsil was regarded as a perfectly useless appendage which cumbered the throat and which, therefore, ought to be gotten rid of. Like its little neighbor, the uvula, it was sacrificed on every possible pretext, or when the surgeon did

not know what else to do. I remember a long while ago, in a discussion on hemorrhage after tonsillotomy before a New York society, a distinguished ex-member of this Association made the statement that he had removed without accident many thousands (I have forgotten the exact number) of tonsils—to which declaration an inquisitive, incredulous individual present, with a mathematical turn of mind, said that he made a calculation which showed that in order to have removed that many tonsils within the limit of an ordinary lifetime the operator would have to average a bushel a day.

This general extirpation of the tonsils that obtained in the early days of laryngology received a rude and jarring jolt when, in the early part of the last century, it was proclaimed that the tonsil was physiologically directly related to the virility of the male. According to this humorous conception, which owed its popularity chiefly to the teachings of no less a personage than Chassaignac, destruction or extirpation of the tonsil meant impairment or extinction of procreative power. This doctrine at once made the operation of tonsillotomy a very unpopular one among the male laity. But when the Homeric shock of the conflict that raged around this burning question had subsided, and it had been found that there were no facts to support the alleged relationship, then the work of slaughtering the tonsils again went merrily on.

But never in the history of laryngology, in the story of medicine or in the chronicles of all mankind, has the lust for operation of the tonsil been as passionate as it is at the present time. It is not simply the surgical thirst from which we all have suffered in our earlier days, just as we, at a still earlier period, suffered from the measles; it is a mania, a madness, an obsession. It has infected not only the general profession, but also the laity. I am constantly sent children for excision of the tonsil in whose throat no evidence of disease appears, or sometimes the existence of the organ can be discovered with a microscope or a fine-toothed comb. While examining some other region before the throat is inspected patients will now inquire if their tonsils ought not to come out. I am told by a leading laryngologist in one of the largest cities that he has been forced to do a complete tonsillotomy in every case in order to satisfy the popular craze and save his practice from destruction. In striking contrast to this condition of affairs was the case of a lady who, a short time ago, consulted me on account of a few concretions in the crypts of one of her tonsils. "Before treating me, Dr. Mackenzie," she said, "I wish it distinctly understood that you are not to take out my tonsils. I have carried them in my throat for sixty-one years, and although during that period they have given me trouble at times, still

they have not materially interfered with my general health and pleasure, and I therefore mean to keep them to the end." "Madam," I replied, "the logic of your position is convincing and indestructible. I will respect your wishes."

The role of the tonsils as portals of infection has, like all new discoveries in medicine, been greatly exaggerated. To state that they are, in certain cases, the avenue through which pathogenic organisms reach the joints, the throat and other organs, is simply to state an incontrovertible proposition, in the light of present-day research. But to make them responsible for the long Iliad of woes which has been laid to their account is to remove the whole question from its legitimate place in the region of cold clinical fact into the atmosphere of fads and fancies.

In connection with the relationship between catarrhal throat disease and rheumatism, I may say in passing that the close relationship or identity of catarrh and rheumatism is probably a matter of ancient recognition. Pliny uses repeatedly the terms *fluxus* and *rheuma* as synonymous; the association was implied in the teachings of the School of Salerno; while the analogies between the two affections engaged the attention of men like Stoll, Hufeland, Hoffmann, Van Swieten, Sydenham, Lancisi, Huxham, Stork and others. Among these, Hufeland considered that catarrh is rheumatism of a mucous membrane.

I have been most interested and instructed in listening to Dr. Goodale's excellent paper, in which he has treated his subject, as he always does, with great lucidity and effectiveness. I have not time to discuss the question, as I have already overstepped my limit, and will, therefore, simply call attention to the fact that it has two sides, a purely bacteriological and a purely clinical one. If we follow the lead of the pure bacteriologist to its extreme limit and logical end we may find in time to come that nothing short of the guillotine or the ax will insure the patient against absolute and certain immunity from infection through the throat.

On the other hand, when we consider the fact that there are constantly loitering and lounging around the oro-and-nasopharynx—this region is the clubhouse of the streptococcus—a miscellaneous crowd of pathogenic bacteria, and when we consider the further fact that thousands of operations on those regions are done every day and done necessarily, without anti-septic precautions, is it not significant at least that we meet with so little sepsis following this performance?

In regard to complete excision of the tonsil, the chief objection to which is, by the way, that it cannot be made perfectly complete, speaking from a purely clinical standpoint, I know that many of these operations are done absolutely unnecessarily,

and I believe that in a good proportion of cases they have been productive of harm. At all events, in every case we should consider the question of shock and other danger, the inconvenience to the patient, and the uncertainty as to results. Let the patient ask "Will it pay?"

Let me not be misunderstood. I have been taking out tonsils for over a quarter of a century and, if my life be spared, I hope to be able to take out many more. My contention is simply this, that in selecting our cases for operation, and especially for complete operation, we should be guided by a sane and safe conservatism and common sense, and not be carried away by those who, by their precept and example, would apparently have us believe that the tonsils were not put into the throat of man by the hand of Almighty God but through the machinations of the devil.

Dr. Bosworth: At the meeting of the International Congress in London, some twenty-seven years ago, I made the assertion that from a practical point of view there were no tonsils in the healthy throat. I believe that this view is being more generally accepted every year, although at the time I first made it it was received with derision.

Much painstaking study has been given to the question of the tonsil, and with the result of throwing no light whatever on it. In summing it all up, I think we are justified in the statement that the negative results are due to the fact that the investigators are trying to determine the physiological function of a pathological lesion.

Dr. Goodale: With regard to the statement which has been made that there are no tonsils in a healthy human throat, I would say that examination of the faucial structures of guinea pigs, of cattle and of swine shows the presence of an aggregation of lymphoid elements not essentially different from the structures that we find in normal children. Examination of normal tonsils from the human subject shows that they are histologically indistinguishable from the tonsils of the pig, which resembles the human animal more nearly than does any other in the histological structure of its different tissues. In the human subject shortly after birth there is an invagination of the epithelium between the pillars of the fauces on each side, around which lymphadenoid tissue is formed, consisting of aggregations of lymphoid cells and endothelial reticulum. As the child increases in size successive invaginations in the vicinity are formed which produce the crypts of the tonsils, such as are present in a child three or four years old. The enlargement of such tonsils is due to the proliferation of tissue excited through the absorption of toxins formed in the vicinity, as in diphtheria,

or the penetration of toxins from other situations, as in scarlet fever, mumps, typhoid fever, etc.

Dr. Casselberry spoke of the importance that the chain of lymph follicles behind the posterior pillar has in infectious arthritis. That is a point that has recently become conspicuous in my mind. In our examinations of the throats of patients we always find a certain number presenting this hypertrophy of the posterior chain. If one asks such a patient whether he has had rheumatism, he will probably say "yes." An examination made during an acute attack of arthritis will show either enlargement of the tonsils or enlargement of the lateral follicles, with inflammation.

In regard to total extirpation of the tonsils, I think that if one is willing to do a very thorough operation the tonsils can be entirely removed. This cannot, however, be done well with cutting instruments. The only safe procedure for these deeply buried tonsils is first to remove what can be gotten out of that portion which protrudes into the mouth, and then, with a deep holder of some sort, get into the interior of the tonsil until the capsule is reached. Then seize the capsule and evert the whole thing, first freeing it from the pillars with whatever instrument you wish.

After it has once been everted it is surprising to see what a shape it assumes. Let the snare then fall over your original holder, and repeat the process of eversion. After this has been done lock the snare and cut the thing down. Careful examination of the capsule will now show a complete excision.

This is a serious operation. There are few patients upon whom I should wish to do it. There is a great deal of soreness for two or three weeks after it has been done.

This brings us to a consideration of the circumstances in which it is necessary. Operations on the tonsils should be done for two purposes: First, for obstruction, when the tonsil interferes with the circulation in the vicinity or has an unfavorable influence upon the Eustachian tube; and, second, for absorption of septic material. The method in each of these conditions is distinct.

In operating upon a child for obstruction one can content one self with doing a simple operation, and, when the child reaches the age of puberty, there will be involution of the remaining portion. That is the ordinary operation. There are relatively few cases in which complete tonsillectomy should be done. These may be grouped more particularly under the conditions of infectious arthritis, recurrent endocarditis and infection of cervical lymph-glands. The first two of these conditions may be very serious menaces to the individual. It may be a question whether he will die or be an invalid for his

remaining years. With proper treatment he may be made comfortable for many years to come. With these I shall group a third condition of cervical adenitis. Cervical adenitis may be the result of toxins generated in the crypts of the tonsil or may be due to tubercular infection. In the first condition the diagnosis is confirmed if, after removal, the external swelling goes down.

In tuberculous cervical lymphadenitis there has been a penetration of tubercle bacilli from or through the tonsil into the lymphnodes of the neck. In such cases removal of the tonsil will not influence the nodes. What should be done in these conditions? A direct answer to that question is found in our results. If a child were brought to me with enlargement of the glands of the neck I should recommend the complete excision of the tonsils before doing anything to the nodes, unless these were in danger of breaking down. If the organisms have only made their way through the crypts of the tonsil into the glands of the neck and you merely remove the glands what is to prevent other infected milk from producing fresh infection? Remove the tonsils as completely as possible, then either do the operation on the glands yourself or turn the case over to the general surgeon.

A CASE OF MULTIPLE PAPILLOMA OF THE LARYNX.

BY SAMUEL W. LANGMAID, M. D.

The history of this case is briefly as follows: A. J. A., machinist, aged thirty years, was first seen in October, 1903. One year ago became hoarse, and has been so ever since. Has no cough and no dyspnoea except from violent exertion. General health fairly good.

Laryngoscopic examination revealed a large growth on lingual surface of the epiglottis; vocal cords covered with a similar growth. Left arytenoid and vocal cord did not do their part in closure of the glottis unless assisted by extrinsic muscles. The growth was unmistakably papillomatous and the microscopic examination corroborated this diagnosis.

The growths did not diminish under applicatoins of salicylic acid or any other of the numerous drugs which have been commended, but increased in size, and new ones appeared at almost every visit.

After a month a systematic course of removal by forceps was begun, but new growths continued to appear. It occurred to me to apply a powder of alum and savin, and this seemed to check the new growth. The growths were the most numerous I have ever seen covering the epiglottis, springing from the region of the ventricles, and, in fact, lining the vestibule of the larynx and covering the cords. They were removed by forceps at frequent intervals, the patient frequently spraying the throat with a strong solution of alumnol until the last one on the middle of the right cord was removed in December of last year. Singularly enough, there was never any dyspnoea. The voice has returned, and the patient is working as a chauffeur.

How much had the applications of alum and powdered savin to do with checking a new growth, and was the constant use of alumnol of like service? I know that the patient has entirely recovered and that long-continued work with forceps was worth doing.

PRESENTATION OF INSTRUMENTS AND SPECIMENS.

Dr. Langmaid presented the instrument referred to in his paper on Massage of the Pharynx; also specimens of laryngeal papillomata. The history of the case from which they were taken is given above.

Dr. Delavan presented a set of instruments designed for the removal of enlarged tonsils. The instruments were formerly the property of the late Dr. Horace Green of New York.

Dr. Roe presented an approved model of his nasal punch forceps.

Dr. Freeman presented a portable electric light for general use in nose and throat examinations.

In connection with his paper on Adenoids, Dr. Richards presented a large collection of forceps, curettes and adenotomes.

Dr. Watson presented a series of gutta percha models, illustrating septal deflections which were discussed in his paper on "Straightening the Septum."

Dr. Kyle presented the tumor described in his paper, Myxofibroma of the Naso-Pharynx.

Dr. Hubbard presented an electric heater for sprays, paper napkins, syringe with asbestos packing, post-nasal tips, etc., referred to in his paper.

Dr. King presented the device for sterilization of sprays, referred to in his remarks on Dr. Hubbard's paper.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Business Meeting.

The twenty-ninth annual Congress of the American Laryngological Association was held at the Cosmos Club, Washington, D. C., in connection with the seventh triennial Congress of American Physicians and Surgeons, on Tuesday, Wednesday and Thursday, May 7, 8, and 9, 1907, under the presidency of Dr. A. W. de Roaldes, of New Orleans, La. During the various sessions of the Congress the following Active Fellows registered:

W. L. Ballenger, Chicago, Ill.
H. S. Birkett, Montreal, Canada.
A. A. Bliss, Philadelphia, Pa.
F. H. Bosworth, New York City.
J. H. Bryan, Washington, D. C.
W. E. Casselberry, Chicago, Ill.
W. F. Chappell, New York City.
J. Payson Clark, Boston, Mass.
C. G. Coakley, New York City.
F. C. Cobb, Boston, Mass.
L. A. Coffin, New York City.
J. Solis-Cohen, Philadelphia, Pa.
A. Coolidge, Jr., Boston, Mass.
D. Bryson Delavan, New York City.
J. W. Farlow, Boston, Mass.
W. J. Freeman, Philadelphia, Pa.
Richard Frothingham, New York City.
J. S. Gibb, Philadelphia, Pa.
J. W. Gleitsmann, New York City.
J. L. Goodale, Boston, Mass.
D. C. Greene, Jr., Boston, Mass.
T. M. Hardie, Chicago, Ill.
J. H. Hartman, Baltimore, Md.
C. R. Holmes, Cincinnati, Ohio.

F. E. Hopkins, Springfield, Mass.
Thomas Hubbard, Toledo, Ohio.
E. Fletcher Ingals, Chicago, Ill.
Franck Hyatt, Washington, D. C.
J. M. Ingersoll, Cleveland, Ohio.
Chevalier Jackson, Pittsburg, Pa.
Samuel Johnston, Baltimore, Md.
Gordon King, New Orleans, La.
F. I. Knight, Boston, Mass.
D. Braden Kyle, Philadelphia, Pa.
S. W. Langmaid, Boston, Mass.
G. A. Leland, Boston, Mass.
William Lincoln, Cleveland, Ohio.
J. H. Lowman, Cleveland, Ohio.
J. N. Mackenzie, Baltimore, Md.
G. H. Makuen, Philadelphia, Pa.
Emil Mayer, New York City.
J. F. McKernon, New York City.
H. P. Mosher, Boston, Mass.
R. C. Myles, New York City.
J. E. Newcomb, New York City.
F. R. Packard, Philadelphia, Pa.
N. H. Pierce, Chicago, Ill.
W. S. Renner, Buffalo, N. Y.
C. C. Rice, New York City.
J. E. Rhodes, Chicago, Ill.
G. L. Richards, Fall River, Mass.
C. W. Richardson, Washington, D. C.
A. W. de Roaldes, New Orleans, La.
J. O. Roe, Rochester, N. Y.
G. E. Shambaugh, Chicago, Ill.
W. K. Simpson, New York City.
H. L. Swain, New Haven, Conn.
A. W. Watson, Philadelphia, Pa.
J. R. Winslow, Baltimore, Md. Total, 59.

At the opening session, Tuesday, May 7, at 10 A. M., the roll was called and the President then introduced Prof. Gustav Killian, of Freiburg i. Breisgau, and Dr. W. Koehlreutter, of

Freiburg i. Baden, Germany, as official guests of the Association, and they were invited to participate in its deliberations. Following this the President presented his address, which was read by Dr. King. The papers assigned for this session were read and discussed, as far as time permitted, and the Association then went into executive session. The first order of business was the election of Fellows. The candidates were as follows:

For Honorary Fellow—Prof. Leopold Von Schroetter, of Vienna (transferred from the list of Corresponding Fellows).

For Active Fellows—Dr. Joseph S. Gibb, Philadelphia, Pa., proposed by Drs. Lincoln and Packard. Thesis, "Is There an Ideal Operation for the Correction of Deviations of the Nasal Septum"? Dr. Christian R. Holmes, Cincinnati, Ohio, proposed by Drs. Kyle and Mayer. Thesis, "Pyogenic Disease of the Accessory Sinuses of the Nose and the Etiology of Facial Erysipelas, including Secondary Effects Upon the Eyes." Dr. Chevalier Jackson, Pittsburg, Pa., proposed by Drs. Freer and Harris. Thesis, "Ligation of the External Carotid Artery from the Pharyngo-Rhinologic Viewpoint. Report of Cases." Dr. George E. Shambaugh, Chicago, Ill., proposed by Drs. Rhodes and Casselberry. Thesis, "The Architecture of the Ethmoid Labyrinth."

Drs. Hubbard and Freeman were appointed tellers. Ballots were cast by thirty-six Fellows. The tellers reported that all the candidates were elected.

Drs. Lincoln and Mosher were appointed a committee to audit the Treasurer's books and annual report.

A Committee of Five was elected to nominate officers for the ensuing year, as follows: Dr. Coolidge, Chairman; Drs. Roe, Johnston, Swain and Ingals.

At 1 P. M. the Congress adjourned and the Fellows with their ladies were entertained at lunch by Dr. Bryan, at his residence, No. 1644 Connecticut avenue.

The afternoon was given up to the exercises of the Triennial Congress. In the evening, Dr. Reginald H. Fitz, M. D., LL. D., delivered the presidential address before this body, and later a general reception was held at the Arlington Hotel.

At the executive session on Wednesday morning at 9:30, the following reports were presented and accepted:

Secretary's Report.

During the year just closed the Association has lost by death the surviving Honorary Fellow, Manuel Garcia, and one of its oldest Active Fellows in time of membership, and a founder, Dr. William Carr Glasgow, of St. Louis, who died some weeks ago after an illness of several months. Including the gentlemen elected yesterday the Active Fellowship now numbers eighty-five. The transference of Prof. L. von Schroetter from the Corresponding to the Honorary list leaves one vacancy in the former. Two names have been proposed for the Corresponding list, viz., Prof. Victor Lange, of Copenhagen, proposed by Dr. Wagner, and Prof. P. Sebileau, of Paris, proposed by Dr. de Roaldes.

The Transactions for 1906 were issued in October last at a cost of \$2.18 per volume. The usual edition of 250 copies was printed and somewhat over 200 have been distributed, sent to libraries or sold.

At the last Congress, Dr. Emil Mayer was appointed as the representative of the association for the Fraenkel Celebration in Berlin in November last. The following letter was sent by the Council to the Berlin Committee for presentation to Professor Fraenkel:

New York City, Oct. 9th., 1906.

Prof. Dr. B. Fraenkel, Berlin.

Honored Sir—The Active Fellows of the American Laryngological Association desire to heartily join in the tribute rendered to you on the occasion of the celebration of your seventieth birthday.

The Association is deeply sensible of the honor conferred upon it by the enrollment of your name on the roster of its Corresponding Fellows.

It congratulates you on a long life honorably spent in the service of science and of your fellow men, not alone in public station but also in private life.

Its Fellows who have visited the city of Berlin have grateful recollections of your personal kindnesses and of the courtesies

extended to them at the University Klinik over which you preside.

Moreover, they beg to express their appreciation of your valuable contributions to the science of Laryngology, not alone in the records of personal experience but also, and notably, in the founding and successful management of the Archiv fuer Laryngologie, the master work in the literature of this special branch of medicine.

Finally they desire to express the wish that many years of happy life may yet be granted you for the continuance of your beneficent activities.

By order of the Council of the Association.

(Signed.)

A. W. DE ROALDES, New Orleans, La., President.

J. E. NEWCOMB, New York City, Clerk.

Herewith is appended a reply to the foregoing letter, addressed to the Secretary, from Dr. Arthur Alexander, of Berlin, a member of Professor Fraenkel's Clinical Staff and the local Chairman of the Committee of Arrangements:

Berlin, March 12, 1907.

Highly Honored Colleague—A year has elapsed since I first came to you with the request for your assistance on behalf of the Bernhard Fraenkel exhibition. With thorough knowledge of the proper manner of approaching the organization of such an exhibit, you kindly transmitted my wishes to the various American Laryngological Associations, and it was due to the personal esteem in which you are held that these requests received their full endorsement and consideration. As the work progressed we became more and more convinced of your exact knowledge of the situation in your country, as its harmoniousness was so apparent.

The American exhibit was, in the mass of all the collection, the most thorough and successful, filling in a wonderful manner its purpose—I may say to our glad surprise—presenting a picture of the development and advance of the science of rhinolaryngology in America. The thought that the Laryngological Associations should be a central point for similar exhibitions

from among the circle of your colleagues, has proven to be entirely correct and in the event of any future attempts of an international nature may be even still more fruitful. In the name of, and by request of my co-workers, it now becomes my pleasant duty to extend to you our sincerest thanks for your untiring consideration.

Will you kindly extend to the highly honored members of the American Laryngological Association our sincerest thanks, for two reasons:

We thank the Association that they have made our cause theirs, and thereby aiding in the brilliant success of the exhibition in honor of Bernard Fraenkel.

We are especially grateful that your Association selected Dr. Emil Mayer, of New York, as your representative, a colleague who, better than any other, was so well equipped to undertake such extensive and painstaking labor. Admirable of disposition, tireless in his work, constantly laboring to fulfil our wishes, he made it a matter of true pleasure to collaborate with him.

In the catalog of the exposition, a copy of which we are forwarding to the library of your Association, we have in the proper places expressed our gratitude to your representative for his share of the work.

That these efforts were highly valued in other minds you will appreciate when you know that the Berlin Laryngological Association have conferred upon your representative, Dr. Emil Mayer, the honor of Corresponding Fellowship.

As your association will shortly hold its annual congress will you kindly inform its members of our expression of thanks?

With great respect and friendly greeting,

(Signed.)

Most respectfully,

ARTHUR ALEXANDER.

In November last the Secretary was advised that the seventieth birthday of our Corresponding Fellow, Prof. von Schroetter, would be made the occasion of a celebration which was held in Vienna, February 5, 1907. By a vote of the Council the following letter was sent:

To Dr. Maximilian Weinberger and Dr. Carl Reitter, Committee :

Gentlemen—The Council of the American Laryngological Association makes thankful acknowledgment of the courteous invitation to participate in the forthcoming celebration of the seventieth birthday of Prof. Leopold von Schroetter R. v. Kristelli.

Unfortunately the time of year at which this will occur renders it impossible for us to send a personal representative. We desire, however, to extend our heartiest congratulations to Prof. von Schroetter on this happy occasion.

The record of this Nestor of laryngological teaching in the place of its birth is one of which any man and any city may well be proud. Almost since the establishment of this Association he has been one of its Corresponding Fellows, and he has been as well the teacher of no small number of its members.

His personal contributions to the literature of laryngology constitute some of its brightest ornaments, and it cannot but be a cause of congratulation throughout the entire medical world that his life has been so graciously prolonged and so fruitful in results for the good of his fellowmen. May that life be still further lengthened out to contribute to science and illustrate the best traditions of our common calling.

On behalf of the Council, I remain, gentlemen,

Yours very truly,

JAMES E. NEWCOMB, M. D., Clerk.

To the foregoing letter the following reply was received:

Wien, February 14, 1907.

Dear Sir—Best thanks for the kind words you were good enough to send me. I hope to see you and many of the members of your Association next year in Vienna, when we shall do all to render your time as useful and as agreeable as possible. I remain yours sincerely,

(Signed.)

SCHROETTER.

One meeting of the Council has been held during the year. (Minutes read.)

This report is respectfully submitted.

JAMES E. NEWCOMB, M. D., Secretary.

Washington, D. C., May 8, 1907.

(Addenda to Secretary's Report)

On the opening day of the Washington meeting the following cablegram was received:

Berlin, 6, Mai.

Laryngological Association, Cosmos Club, Washington.

Verbindlichen Dank Amerikas Betheiligung beim siebzigsten Geburtstag. Herzlichste Gruesse.

B. FRAENKEL.

Professor Schroetter was duly notified of his election to Honorary Fellowship and sent the following reply:

Wien, May 5, 1907.

Dear Sir---Highly appreciating the great honor which has been bestowed on me, I thank you, the President, and all the members of the American Laryngological Association most heartily, who have been so kind to think of me.

I shall always be very very much pleased to receive any member of your Association in our country and to be useful to him in following his studies.

I remain, dear sir, with the renewed expression of my thanks, in highest esteem, Yours faithfully,

SCHROETTER.

Report of the Treasurer.

Receipts.

Balance from old account.....	\$317.68
Sale of dinner tickets, 1906.....	150.00
Sale of Transactions.....	22.50
Exchange on cheque.....	.15
Arrears of dues.....	130.00
Dues for current year.....	720.00
Loan, Riverside Bank.....	350.00
Total receipts.....	<u>\$1,690.33</u>

Expenditures.

Annual dinner, 1906.....	\$166.00
Stenographer, 1906.....	105.00
Publishing Transactions, 1906.....	544.25
Expenses in connection with Fraenkel Celebration.....	24.00
Repayment loan, Riverside Bank.....	350.00
Interest on loan.....	7.00
Programmes and distribution for 1907.....	28.25
Printing and stationery.....	44.11
Incidentals, Secretary and Treasurer, telegrams, telephone, expressage, etc.....	34.16
Total expenditures.....	<u>\$1,302.77</u>
Balance to new account.....	387.56
	<u>\$1,690.33</u>

Statement of Assets and Liabilities.

Assets: Unpaid dues.....	\$90.00
Postage in office.....	7.92
Bank balance.....	387.56
Total assets.....	<u>\$485.48</u>
Liabilities: Due Treasurer.....	1.68
Net assets.....	<u>\$483.80</u>
Gain over one year ago.....	73.11

Audited and found correct:

(Signed)

WILLIAM R. LINCOLN,
HARRIS P. MOSHER,
Auditing Committee.

Librarian's Report.

Since the last meeting of the Association the Librarian has to report that forty-nine pamphlets and two bound volumes have been added to the library of the Association, and have been deposited in the library of the Surgeon General of the United States Army. Respectfully submitted,

J. H. BRYAN, Librarian.

The Chairman of the Nominating Committee, Dr. Coolidge, presented the following report:

For President—Dr. H. S. Birkett, Montreal, Canada.

For First Vice-President—Dr. J. Payson Clark, Boston, Mass.

For Second Vice-President—Dr. J. Edwin Rhodes, Chicago, Ill.

For Secretary and Treasurer—Dr. J. E. Newcomb, New York City.

For Librarian—Dr. J. H. Bryan, Washington, D. C.

For Member of the Council (to serve for four years)—Dr. A. W. de Roaldes, New Orleans, La.

Place and date of next meeting to be determined by the Council.

It was voted that the President and Secretary be authorized to issue the proper credentials to any Fellow who might intend to be present at the Tuerck-Czermak Semi-Centennial, to be held in Vienna in 1908.

The following report was submitted by Dr. Emil Mayer:

New York, April 24, 1907.

To the Council and Fellows of the American Laryngological Association.

Gentlemen: In accordance with your resolution electing me as your representative in the matter of the Bernhard Fraenkel exhibition I have the honor to report as follows:

Immediately after the action taken by your body, the two other large laryngological associations in this country took similar action, and I thus became the sole representative for American laryngology for the purpose mentioned.

By this means of centralization, reduplication was largely avoided, and the arduous work of Professor Fraenkel's assistants

made the lighter in that their correspondence was limited to myself only for matters pertaining to this country.

Over 600 circular letters were sent to the laryngologists, surgical instrument makers and book publishers of this country, and the responses were prompt and generous, in the main.

Many individual loans were made, and through the hearty co-operation of our fellow member, Prof. W. K. Simpson, a large loan of instruments of historic value was obtained from the Lefferts collection of the College of Physicians and Surgeons of New York, especially of the instruments originally used and the perfected ones in intubation of the larynx.

The active co-operation of the firms of Tiemann and Company, Ford, Meyrowitz, Davidson Rubber Company, Globe Nebulizer Company, the Allison Company, and others promptly assured the success of the exhibition from our point of view.

The book publishers almost unanimously placed in my hands every work on laryngology and rhinology of American origin, and subsequently generously donated these publications to the library of Professor Fraenkel's Clinic.

In this connection I beg to call attention to the fact that the aforementioned library would appreciate the receipt of the bound volumes of your transactions, hereafter to be published.

The exhibit, which was opened with appropriate ceremonies on November 17, 1906, was successful in every point of view; the American exhibit standing forth as the most prominent next to that of Germany.

Special attention is called to the very valuable aid that was given us by the firm of Kny-Scheerer and Company, who received, packed, and forwarded to Berlin the goods loaned, and who, on their return, secured the goods from the customs and returned them to their owners.

I beg to extend my thanks to all our colleagues for their cordial assistance, as also to the committee in charge of the Fraenkel exhibit for their uniform courtesy.

Respectfully submitted,

EMIL MAYER.

It was voted that the foregoing report be accepted and that

the thanks of the Association be extended to Dr. Mayer for his efficient service.

At the close of the executive session the reading of papers was continued, with discussion thereon. Adjournment was taken at 1 P. M., and the Fellows and their ladies were entertained at lunch by Dr. Richardson, at his residence, 1317 Connecticut avenue. His additional guests were Prof. Gustav Killian, Dr. Koehltreutter, and the members of the American Otological and Climatological Associations.

The afternoon was devoted to the session of the Triennial Congress.

In the evening the annual dinner of the Association was held at the New Willard. Fifty-one Fellows were in attendance, and two guests, Prof. Killian and Dr. Koehltreutter.

The closing session was held Thursday morning at 9:30. The remaining papers on the programme were read and discussed and the Association then went into executive session. The following resolutions were adopted:

Resolved, That the sincere thanks of the Fellows of this Association be and hereby are tendered to our retiring President, Dr. A. W. de Roaldes, for his generosity as shown by the gift of \$500 for the establishment of a Prize Fund, hereby accepted with grateful acknowledgment.

Resolved, That the Treasurer be authorized to receive this fund and to have custody thereof pending further direction by the Council.

The next business was the election of officers. The report of the Nominating Committee was read again and the Secretary directed to cast an affirmative ballot for the nominees as therein specified. This was done and they were declared elected.

The retiring President appointed Drs. Bryan and Greene a committee to escort the President-elect, Dr. Birkett, to the chair. Brief remarks were made by Dr. de Roaldes, who thanked the Fellows for their large attendance at and courtesies extended during the Congress now closing. On taking the chair Dr. Birkett expressed his thanks for the honor conferred upon him, and bespoke a continuance of the loyalty toward the

Association as manifested by the Fellows at the present Congress. It was

Resolved, That the thanks of the Association be extended to the Governors of the Cosmos Club for their courteous grant of their assembly room for the sessions of the present Congress and for the extension of house privileges to our members.

Resolved, That the thanks of the Association be extended to the President and Secretary for their efficient labors during the past year, which have so greatly contributed to the success of this meeting.

Resolved, That further thanks be extended to our Washington colleagues, Drs. Bryan and Richardson, for their hospitality.

There being no further business, the Congress adjourned.

JAMES E. NEWCOMB, Secretary.

WILLIAM CARR GLASGOW, M. D.

In the death of Dr. Glasgow in St. Louis, the city of his birth and the scene of his professional labors, the Association loses one of its founders. His death occurred on March 22, 1907, after an illness of several months.

The following account of his life and activities is taken partly from data on file in the records of the Association and largely from an appreciative notice which was published by our colleague, Dr. Delavan, in the New York Medical Journal of April 13, 1907.

Dr. Glasgow came of excellent ancestry. His family settled in St. Louis among the first of the English speaking element of that section. In the early part of the last century his maternal grandfather, Dr. Carrlane, was mayor of the city for a period of thirty-five years, and its most influential citizen. His father, William Glasgow, was a public spirited man of considerable prominence. There were always physicians in the family. Thus Dr. Glasgow came of fine stock. He started life in a good position. His medical instincts came to him by inheritance. Finally, he was able to avail himself of the very best opportunities for general culture and for special professional education, both in this country and abroad.

He graduated from Washington University in 1865 and studied medicine in the St. Louis Medical College, from which institution he received his degree in 1869. He also studied at the Long Island Medical College, and supplemented his American training by work at the University of Vienna. On his return to his native city he immediately entered on the active practice of his profession, devoting himself to diseases of the upper air passages. He was soon appointed Professor of Laryngology in the Medical Department of Washington University, filling the chair until within a few years with distinguished credit. From 1875 to 1900 he was Professor of Theory and Practice of Medicine in the St. Louis Medical College, and in the year 1890 was appointed to the corresponding chair in the Missouri Medical College. He was an active member of the American Medical Association, American Climatological Association, Missouri State Medical Society and the St. Louis Medical Society. At various times he served on the attending staffs of the Mullanphy Hospital, St. Louis City Hospital, Polyclinic Hospital and the Hospital for Children.

In 1878 he became one of the founders of the American Laryngological Association, in company with such cultivated and distinguished specialists as Knight, Solis-Cohen, Lefferts, Shurly, Elsberg, Wagner, Lincoln, Ingals, and the like. Among his early contributions to medical literature were several highly suggestive and original articles, notably those upon septal deformities and upon vasomotor neuroses of the nasal cavity. Later in his career he added to his practice the field of diseases of the chest. In it, as in laryngology, there existed no better authority. As a scholar and as a man Dr. Glasgow represented the highest and best type of the American physician. Through his character, breeding, and temperament his high social standing was everywhere assured. As a physician he was devoted to the welfare of all classes needing his aid. He was enthusiastic in his love for the scientific side of his calling. Personally, with unusual temptations to the contrary, he possessed a singular modesty of disposition and a large appreciation of the good work of other men. Notoriety of any kind was especially repugnant to him. Easily the first authority in his department

in a section of the United States geographically larger than that occupied by any of his contemporaries living in other cities, he held the field without the semblance of a rival from the beginning to the end of his long and useful career. He was a delightful companion, an ideal physician and a widely appreciated and dearly loved friend.

Dr. Glasgow was a member of the first Council of the Association and in the first volume of Transactions published a paper on "A Few Suggestions on Anaesthesia of the Larynx."

Ten other papers were presented by him to the Association, the last being in 1903, entitled "The Medical Treatment of Adenoids and Enlarged Tonsils."

His widow and several children survive. To his family and wide circle of friends this Association tenders a tribute of deep sympathy and an expression of appreciation of the manly character, high professional attainments and warm-hearted friendship of the life now ended.

LIST OF MEMBERS.

Active Fellows.

1908.

1906. BALLENGER, WILLIAM L., Columbus Memorial Building,
Chicago, Ill.
1880. BEAN, C. E., Germania Life Bldg., St. Paul, Minn.
1904. BERENS, T. PASSMORE, 35 Park Ave., New York.
1893. BIRKETT, HERBERT S., 252 Mountain St., Montreal.
1893. BLISS, ARTHUR AMES, 117 South 20th St., Philadelphia,
Pa.
1878. BOSWORTH, FRANCKE H., 41 Park Ave., New York.
1901. BROWN, J. PRICE, 37 Carlton St., Toronto, Can.
1892. BROWN, MOREAU R., 34 Washington St., Chicago, Ill.
1891. BRYAN, JOSEPH H., 818 17th St., Washington, D. C.
1889. CASSELBERRY, WILLIAM E., 34 Washington St., Chicago,
Ill.
1896. CHAPPELL, WALTER F., 7 East 55th St., New York.
1897. CLARK, J. PAYSON, 71 Marlborough St., Boston, Mass.
1902. COAKLEY, CORNELIUS G., 53 West 56th St., New York.
1899. COBB, FREDERICK C., 11 Marlborough St., Boston, Mass.
1905. COFFIN, LEWIS A., 156 West 58th St., New York.
1878. COHEN, J. SOLIS-, 1824 Chestnut St., Philadelphia, Pa.
1893. COOLIDGE, ALGERNON, JR., 613 Beacon St., Boston, Mass.
1882. DEBLOIS, THOMAS AMORY, 48 Gloucester St., Boston,
Mass.
1881. DELAVAN, D. BRYSON, 1 East 33d St., New York.
1892. FARLOW, JOHN W., 234 Clarendon St., Boston, Mass.
1901. FREEMAN, WALTER J., 1832 Spruce St., Philadelphia, Pa.
1905. FREER, OTTO T., 34 Washington St., Chicago, Ill.
1879. FRENCH, THOMAS R., 150 Joralemon St., Brooklyn, N. Y.
1897. FROTHINGHAM, RICHARD, Sydenham Bldg., Madison Ave.
and 58th St., New York.
1907. GIBB, JOSEPH S., 1907 Chestnut St., Philadelphia, Pa.
1880. GLEITSMANN, JOSEPH W., Sydenham Building, Madison
Ave. and 58th St., New York.

1898. GOODALE, JOSEPH L., 258 Beacon St., Boston, Mass.
1905. GRAYSON, CHARLES P., 251 South 16th St., Philadelphia, Pa.
1906. GREENE, D. CROSBY, JR., 483 Beacon St., Boston, Mass.
1905. HALSTED, THOMAS H., 831 University Block, Syracuse, N. Y.
1896. HARDIE, T. MELVILLE, 34 Washington St., Chicago, Ill.
1903. HARRIS, THOMAS J., 117 East 40th St., New York.
1878. HARTMAN, JACOB H., 5 West Franklin St., Baltimore, Md.
1888. HINKEL, F. WHITEHILL, 581 Delaware Ave., Buffalo, N. Y.
1881. HITCHCOCK, URBAN G., 122 West 49th St., New York.
1907. HOLMES, CHRISTIAN R., 8 East 8th St., Cincinnati, O.
1893. HOPE, GEORGE B., 133 West 72d St., New York.
1895. HOPKINS, FREDERIC E., 25 Harrison Ave., Springfield, Mass.
1895. HUBBARD, THOMAS, 205 Ontario St., Toledo, O.
1901. HYATT, FRANCK, 1022 14th St., N. W., Washington, D. C.
1878. INGALS, E. FLETCHER, 36 Washington St., Chicago, Ill.
1904. INGERSOLL, JOHN M., 318 Euclid Ave., Cleveland, Ohio.
1882. IVES, FRANK L., 117 East 30th St., New York.
1907. JACKSON, CHEVALIER, 428 Park Bldg., Pittsburg, Pa.
1878. JOHNSTON, SAMUEL, 204 West Monument St., Baltimore, Md.
1901. KING, GORDON, 624 Gravier St., New Orleans, La.
1885. KNIGHT, CHARLES H., The St. Hubert, 120 West 57th St., New York.
1878. KNIGHT, FREDERIC I., 195 Beacon St., Boston, Mass.
1898. KYLE, D. BRADEN, 1517 Walnut St., Philadelphia, Pa.
1880. LANGMAID, SAMUEL W., 277 Dartmouth St., Boston, Mass.
1878. LEFFERTS, GEORGE MOREWOOD, 212 Madison Ave., N. Y.
1894. LELAND, GEORGE A., 354 Commonwealth Ave., Boston, Mass.
1903. LINCOLN, WILLIAM, 210 Lennox Bldg., Cleveland, O.
1897. LOGAN, JAMES E., 1208 Wyandotte St., Kansas City, Mo.
1888. LOWMAN, JOHN H., 441 Prospect St., Cleveland, O.
1886. MACCOY, ALEXANDER W., 216 South 15th St., Philadelphia, Pa.

1883. MACKENZIE, JOHN N., 605 Washington Place, Baltimore, Md.
1898. MAKUEN, G. HUDSON, 1627 Walnut St., Philadelphia, Pa.
1896. MAYER, EMIL, 25 East 77th St., New York.
1899. MCKERNON, JAMES F., 62 West 52d St., New York.
1904. MOSHER, HARRIS P., 828 Beacon St., Boston, Mass.
1901. MYLES, ROBERT C., 46 West 38th St., New York.
1893. NEWCOMB, JAMES E., 118 West 69th St., New York.
1903. PACKARD, FRANCIS R., S. E. Cor. 19th and Pine Sts., Philadelphia, Pa.
1906. PIERCE, NORVAL H., 31 Washington St., Chicago, Ill.
1892. PORCHER, W. PEYRE, 85 Broad St., Charleston, S. C.
1878. PORTER, WILLIAM, 3886 Washington Ave., St. Louis, Mo.
1903. RENNER, W. SCOTT, 361 Pearl St., Buffalo, N. Y.
1897. RHODES, J. EDWIN, 100 State St., Chicago, Ill.
1884. RICE, CLARENCE C., 123 East 19th St., New York.
1905. RICHARDS, GEORGE L., 84 North Main St., Fall River, Mass.
1902. RICHARDSON, CHARLES W., 1317 Connecticut Ave., Washington, D. C.
1893. ROALDES, ARTHUR W. DE, 624 Gravier St., New Orleans, La.
1879. ROE, JOHN O., 44 Clinton Ave., South Rochester, N. Y.
1907. SHAMBAUGH, GEORGE E., 100 State St., Chicago, Ill.
1878. SHURLY, ERNEST L., 32 Adams Ave. W., Detroit, Mich.
1892. SIMPSON, WILLIAM K., 952 Lexington Ave., New York.
1889. SWAIN, HENRY L., 232 York St., New Haven, Conn.
1903. THEISEN, CLEMENT F., 172 Washington Ave., Albany, N. Y.
1892. THRASHER, ALLEN B., The Groton, 7th and Race Sts., Cincinnati, Ohio.
1892. WAGNER, HENRY L., Pacific Union Club, San Francisco, Cal.
1892. WATSON, ARTHUR W., 126 South 18th St., Philadelphia, Pa.
1906. WINSLOW, JOHN R., 114 West Franklin St., Baltimore, Md.
1905. WOOD, GEORGE B., 129 South 18th St., Philadelphia, Pa.
1890. WRIGHT, JONATHAN, 44 West 49th St., New York.

Honorary Fellow.

1881. SCHROETTER, LEOPOLD V., Schwartzembourgstrasse, 8.
Vienna, Austria.

Corresponding Fellows.

1880. BRUNS, PAUL, Tübingen, Württemberg, Germany.
1896. CHIARI, OTTO KAR, Bellariastrasse 12, Vienna, Austria.
1901. COLLIER, MAYO, 145 Harley St., Cavendish Square, London W., England.
1890. DE LA SOTA Y LASTRA, R., 7 Calle de Torqueros, Seville, Spain.
1893. DESVERNINE, C. M., Cuba 52, Havana, Cuba.
1904. FRAENKEL, B., Bellevue-Strasse 4, Berlin W. 9, Germany.
1901. GRANT, DUNDAS, 18 Cavendish Square, London W., England.
1902. HEYMANN, PAUL, 60 Lützowstrasse, Berlin W., Germany.
1894. HOLDEN, E., 13 Central Ave., Newark, N. J.
1892. KRAUSE, H., Kronprinzenufer, 15, Berlin, N. W., Germany.
1881. LABUS, CARLO, Piazza Castello 28, Milan, Italy.
1902. LERMOYEZ, MARCEL, 20 Rue de la Boétie, Paris, France.
1897. LUC, H., 54 Rue de Varenne, Paris, France.
1903. MCBRIDE, P., 16 Chester St., Edinburgh, Scotland.
1896. MACDONALD, GREVILLE, 85 Harley St., Cavendish Square, London W., England.
1894. MACINTYRE, JOHN, 179 Bath St., Glasgow, Scotland.
1892. MASSEI, F., 4 Piazza Municipio, Naples, Italy.
1887. MOURE, E. J., 25 Cours du Jardin-Public, Bordeaux, France.
1896. MYGIND, HOLGER, 31 Havnegade, Copenhagen, Denmark.
1901. NATIER, MARCEL, 12 Rue Caumartin, Paris, France.
1903. ONODI, A., o'Uctza 12, Buda-Pesth, Hungary.
1894. SAJOUS, C. E., 2043 Walnut St., Philadelphia, Pa.
1901. SCHMIDT, MORITZ, Schaumainkai, Sachsenhausen, 15, Frankfurt, Germany.
1896. SCHMIEGLOW, ERNEST, 18 Nørregade, Copenhagen, Denmark.

- 1881. SEMON, SIR FELIX, 39 Wimpole St., Cavendish Square,
London W., England.
- 1902. THOMSON, ST. CLAIR, 28 Queen Anne St., Cavendish
Square, London W., England.
- 1903. TILLEY, HERBERT, 89 Harley St., Cavendish Square,
London W., England.
- 1901. WINGRAVE, WYATT, 11 Devonshire St., Portland Place,
London W., England.
- 1894. WOLFENDEN, R. NORRIS, Rougemont, Seaford, Sussex,
England.

PAST OFFICERS.

Presidents.

(Year of Election.)

1879.	Louis Elsberg.	1893.	D. B. Delavan.
1880.	J. Solis-Cohen.	1894.	J. O. Roe.
1881.	F. I. Knight.	1895.	W. H. Daly.
1882.	G. M. Lefferts.	1896.	C. H. Knight.
1883.	F. H. Bosworth.	1897.	T. R. French.
1884.	E. L. Shurly.	1898.	W. E. Casselberry.
1885.	Harrison Allen.	1899.	Samuel Johnston.
1886.	E. Fletcher Ingals.	1900.	H. L. Swain.
1887.	R. P. Lincoln.	1901.	J. W. Farlow.
1888.	E. C. Morgan.	1902.	J. H. Bryan.
1889.	J. N. Mackenzie.	1903.	J. H. Hartman.
1890.	W. C. Glasgow.	1904.	C. C. Rice.
1891.	S. W. Langmaid.	1905.	J. W. Gleitsmann.
1892.	M. J. Asch.	1906.	A. W. de Roaldes.

Vice-Presidents.

1879.	F. H. Davis.
1880.	W. C. Glasgow, J. O. Roe.
1881.	E. L. Shurly, W. Porter,
1882.	C. Seiler, E. F. Ingals.
1883.	S. W. Langmaid, S. Johnston.
1884.	J. H. Hartman, W. H. Daly.
1885.	H. A. Johnson, G. W. Major.
1886.	E. C. Morgan, J. N. Mackenzie.
1887.	J. N. Mackenzie, S. W. Langmaid.
1888.	W. C. Glasgow, C. E. Sajous.
1889.	E. Holden, C. E. Bean.
1890.	J. O. Roe, J. H. Hartman.
1891.	M. J. Asch, S. Johnston.

- 1892. S. Johnston, J. C. Mulhall.
- 1893. J. C. Mulhall, W. E. Casselberry.
- 1894. C. C. Rice, S. H. Chapman.
- 1895. J. Wright, A. W. de Roaldes.
- 1896. T. M. Murray, D. N. Rankin.
- 1897. A. W. MacCoy, H. S. Birkett.
- 1898. J. W. Farlow, F. W. Hinkel.
- 1899. T. A. DeBlois, M. R. Brown.
- 1900. H. L. Wagner, A. A. Bliss.
- 1901. J. W. Gleitsmann, D. Braden Kyle.
- 1902. G. A. Leland, T. Melville Hardie.
- 1903. J. H. Lowman, W. Peyre Porcher.
- 1904. Thomas Hubbard, W. J. Freeman.
- 1905. J. L. Goodale, C. W. Richardson.
- 1906. G. H. Makuen, A. B. Thrasher.

Secretaries and Treasurers.

- 1879. G. M. Lefferts. 1889. C. H. Knight.
- 1882. D. B. Delavan. 1895. H. L. Swain.
- 1900. J. E. Newcomb.

Librarians.

- 1879. F. H. Bosworth. 1883. T. R. French.
- 1903. J. H. Bryan.

PAST MEMBERS.

Honorary Fellows.

- *1880. Senor Manuel Garcia, London, England.
- *1883. Sir Morell Mackenzie, London, England.

Corresponding Fellows.

- *1892. Lennox Browne, London, England.
- *1887. A. Gouguenheim, Paris, France.
- *1880. Wilhelm Meyer, Copenhagen, Denmark.
- *1881. Pugin Thorton, London, England.
- *1881. R. Voltolini, Breslau, Germany.
- *1880. W. McNeil Whistler, London, England.
- ††1881. Leopold von Schroetter, Vienna, Austria.

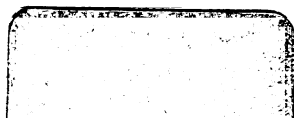
Active Fellows.

- *1880. Harrison Allen, Philadelphia, Pa.
- *1878. Morris J. Asch, New York.
- 1895. J. E. Boylan, Cincinnati, Ohio.
- *1883. C. W. Chamberlain, Hartford, Conn.
- *1882. S. Hartwell Chapman, New Haven, Conn.
- 1884. S. Solis-Cohen, Philadelphia, Pa.
- 1880. E. W. Cushing, Boston, Mass.
- 1878. Ephraim Cutter, Boston, Mass.
- *1880. W. H. Daly, Pittsburg, Pa.
- *1878. F. H. Davis, Chicago, Ill.
- *1901. E. T. Dickerman, Chicago, Ill.
- *1878. Frank Donaldson, Baltimore, Md.
- 1886. Frank Donaldson, Jr., Baltimore, Md.
- *1879. J. H. Douglas, New York City.
- *1879. W. F. Duncan, New York City.
- *1878. Louis Elsberg, New York City.
- *1878. William Carr Glasgow, St. Louis, Mo.

- †1879. Edgar Holden, Newark, N. J.
- *1882. Franklin H. Hooper, Boston, Mass.
- *1878. Hosmer A. Johnson, Chicago, Ill.
- *1879. Woolsey Johnson, New York City.
- *1880. William C. Jarvis, New York City.
- 1879. R. H. Kealhofer, St. Louis, Mo.
- *1878. Rufus P. Lincoln, New York City.
- 1881. G. W. Major, Montreal, Canada.
- 1879. Charles McBurney, New York City.
- 1885. H. Clinton McSherry, Baltimore, Md.
- *1881. E. C. Morgan, Washington, D. C.
- *1886. J. C. Mulhall, St. Louis, Mo.
- 1892. T. Morris Murray, Washington, D. C.
- 1881. H. Mynter, Buffalo, N. Y.
- *1895. J. E. H. Nichols, New York City.
- 1879. H. K. C. Oliver, Boston, Mass.
- 1894. William H. Park, New York City.
- *1880. D. N. Rankin, Allegheny, Pa.
- 1881. J. M. Robertson, Detroit, Mich.
- 1878. Beverly Robinson, New York City.
- *1878. T. F. Rumbold, St. Louis, Mo.
- †1880. Charles E. Sajous, Paris, France.
- *1879. Carl Seiler, Scranton, Pa.
- *1893. Charles M. Shields, Richmond, Va.
- 1879. Andrew H. Smith, New York City.
- 1879. Bernhard Tauber, Cincinnati, Ohio.
- *1899. Max Thorner, Cincinnati, Ohio.
- 1888. S. O. Van der Poel, New York City.
- 1878. Clinton Wagner, New York City.
- 1896. Marshall R. Ward, Pittsburg, Pa.
- 1879. Whitfield Ward, New York City.
- *1886. Benjamin F. Westbrook, Brooklyn, N. Y.
- 1896. Greene V. Woollen, Indianapolis, Ind.

*Deceased. †Corresponding Fellow. ††Honorary Fellow.

413
16+





3 2044 102 963 352