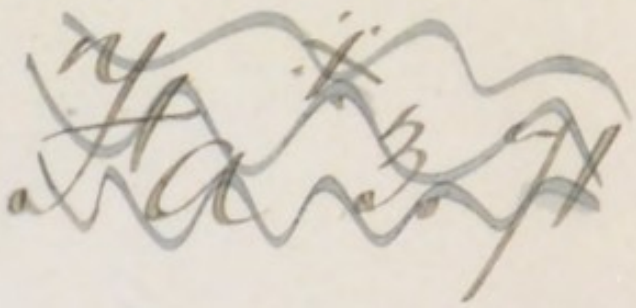
Diseases of the nasal organs and naso-pharynx / by Whitfield Ward.

Diseases of the Nasal Organs



DISEASES OF THE NASAL ORGANS AND NASO-PHARYNX

BY

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THIS LITTLE BOOK IS

RESPECTFULLY DEDICATED TO

SIR MORELL MACKENZIE

BY HIS FORMER PUPIL

IN GRATEFUL REMEMBRANCE OF MANY ACTS

OF COURTESY

PREFACE

WITHIN the past few years great progress has been made in the treatment of the many diseases so frequently found in the nasal cavities.

This has been especially marked in those affections calling for surgical operations, many improved methods and many new instruments having been invented for their better performance.

With reference to the present work, I have endeavored to present the subject as clearly and concisely as possible, seeking to view the matter from a practical rather than from a theoretical standpoint. It is generally customary in writings of this nature, more especially when treating of the surgery of the subject, to present many methods of operation which are seldom if ever employed, and which not only add to the bulk of the work but also have a tendency to confuse the minds of those not thoroughly versed in nasal therapeutics.

In my treatment of these affections I have striven only to tabulate such plans of procedure as have been proven beyond the peradventure of a doubt to be perfectly feasible. Another and exceedingly important point has also been kept in view, and that is to give pre-eminence to those operations which are both simple as to their performance and rapid as to their action, thereby consulting the feelings of the patient as well as the convenience of the surgeon.

THE AUTHOR.

128 East 36th Street.

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CHAPTER I.

ANATOMY.

THE nose is composed of a framework of bones and cartilages, the latter being acted upon by certain muscles. The bony framework occupies the upper part of the organ, and consists of the nasal bones and nasal processes of the superior maxillary. The cartilaginous framework consists of five pieces, the two upper and the two lower lateral cartilages and the cartilage of the septum.

The upper lateral cartilages are situated below the free margin of the nasal bones. Each cartilage is flattened and triangular in shape. Its anterior margin is thicker than the posterior and connected with the fibro-cartilage of the septum. Its posterior margin is attached to the nasal process of the superior maxillary and nasal bones.

The lower lateral cartilages are two thin flexible plates situated immediately below the preceding, and curved in such a manner as to form the inner and outer wall of each orifice of the nostril. The cartilage of the septum is somewhat triangular in form, thicker at the margin than at its centre, and completes the separation between the nasal fossæ in front.

Its anterior margin is thickest above, is connected from above downwards with the nasal bones, the front part of the two upper lateral cartilages, and the inner portion of the two lower lateral cartilages.

Its posterior margin is connected with the perpendicular lamella of the ethmoid, its inferior margin with the vomer and palate processes of the superior maxillary bones.

The nasal fossæ are two irregular cavities situated in the line of the face extending from the base of the cranium to the roof of the mouth, and separated from each other by a thin vertical septum. They communicate by two large apertures, the anterior nares, with the front of the face and with the pharynx behind by the posterior nares.

Each nasal fossa communicates with four sinuses, viz.: the frontal above, the sphenoidal behind, the maxillary below, and the ethmoidal on either side.

The frontal sinuses are two irregular cavities, which extend upwards and outwards, a variable distance, between the two tables of the skull, and are separated from one another by a thin, bony septum.

The sphenoidal sinuses are two large irregular cavities hollowed out of the interior of the body of the sphenoid bone, and separated from one another by a more or less complete perpendicular bony septum.

The maxillary sinus or antrum of Highmore is a large triangular-shaped cavity, hollowed out of the body of the maxillary bone; its apex, directed outward, is formed by the malar process; its base, by the outer wall of the nose.

The ethmoidal sinuses are two sets of cells located in each lateral mass of the ethmoid bone. The cellular cavities of each lateral mass are divided by a thin, transverse, bony partition into two sets which do not communicate with each other.

Each nasal fossa communicates with the orbit by the lachrymal duct, which enters the nasal cavity by a small opening in the inferior meatus.

The anterior nasal cavities are the portion of the nasal fossæ extending from the margin of the nostrils to the large openings known as the posterior nares. They are separated by a thin, vertical partition, the septum, which is composed in front by the crest of the nasal bones, the nasal spine of the frontal and the triangular cartilage of the nose; in the middle, by the perpendicular lamella of the ethmoid; behind, by the vomer and rostrum of the sphenoid; below, by the crest of the superior maxillary and palate bones.

That portion of the septum occupied by the triangular cartilage is seldom straight, being generally inclined either to one side or the other, which peculiarity is simply due to the flexibility of the cartilaginous tissue, and to the many accidents which are liable to occur to the nasal organ on account of its prominence on the face.

On the outer side of each of the anterior nasal cavities and projecting towards the septum are three prominences called the sphenoidal turbinated bones. The higher of these protuberances, called from its position the superior, protrudes perpendicularly from the roof of the cavity, and is the smaller of the three bones. The middle and next largest juts out obliquely from the outer wall of the nares, its free edge presenting a somewhat curled appearance. The inferior, the largest of the three bones, resembles somewhat the middle turbinated; it stands out, however, a little more horizontally, and the curl of its edge is a little more pronounced. Underneath these prominences we have a series of cavities, called the meatuses; that beneath the superior turbinated bone being the superior meatus, that beneath the middle the middle meatus, that beneath the inferior the inferior meatus. The canal of the sphenoidal sinus opens into the superior meatus; the infundibulum, the outlet of the frontal sinuses, and the orifice of the antrum open into the middle meatus; and the nasal duct opens into the inferior meatus.

The mucous membrane lining the nasal fossæ is called pituitary from the nature of its secretions, or Schneiderian, from Schneider, the first anatomist who showed that the secretion proceeded from the mucous membrane, and not, as was formerly imagined, from the brain. It is intimately adherent to the periosteum, or perichondrium, over which it lies, and is continuous externally with the skin through the anterior nares, and with the mucous membrane of the pharynx through the posterior nares. The mucous membrane is thickest and most vascular over the turbinated bones; but in the intervals between the spongy bones, and on the floor of the nasal fossæ, it is very thin. The surface of the membrane is covered with a layer of tesselated epithelium at the upper part of the nasal fossæ corresponding with the distribution of the olfactory nerve, but it is ciliated throughout the rest of its extent, excepting near the aperture of the nares.

The arteries of the nasal fossæ are the anterior and posterior ethmoidal, from the ophthalmic, which supply the ethmoidal cells, frontal sinuses, and roof of the nose; the spheno-palatine, from the internal maxillary, which supplies the mucous membrane covering the turbinated bones, the meatuses, and septum; and the alveolar branch of the internal maxillary, which supplies the lining membrane of the antrum.

The veins of the nasal fossæ form a close network

beneath the mucous membrane. They pass some with the veins accompanying the spheno-palatine artery, through the spheno-palatine foramen, and others through the alveolar branch join the facial vein.

The nerves are the olfactory, the nasal branch of the ophthalmic, filaments from the anterior dental branch of the superior maxillary, the vidian, naso-palatine, descending anterior palatine, and spheno-palatine branches of Meckell's ganglion. The olfactory, the special nerve of the sense of smell, is distributed over the upper third of the septum and outer wall of the nasal fossæ.

Filaments from the anterior branch of the superior maxillary supply the inferior meatus and inferior turbinated bone. The vidian nerve and upper anterior nasal branches from the spheno-palatine ganglion, supply the upper and back part of the septum, and superior turbinated bone. The naso-palatine supplies the middle of the septum, while the larger or anterior palatine nerve supplies the middle and lower turbinated bones.

The Posterior Nasal Cavity.—The posterior nasal cavity extends from the posterior border of the anterior nasal cavity to the velum when this valve-like body is approximated to the pharyngeal wall.

Generally speaking, all that portion of the nasal organ brought into view by the rhinoscopic mouth-mirror is called the posterior nares.

The vault of the pharynx is the vault-like dome, produced by the merging of the nasal passages into the top of the pharyngeal wall.

The isthmus of the fauces is the space which is found between the pharyngeal wall and the soft palate when the latter organ is in a dependent condition.

The posterior rhinoscopic image, for convenience of description, may be divided into three portions: a central and two lateral. The parts constituting the central portion of the picture are the septum, the fossæ, and the posterior surface of the velum and uvula.

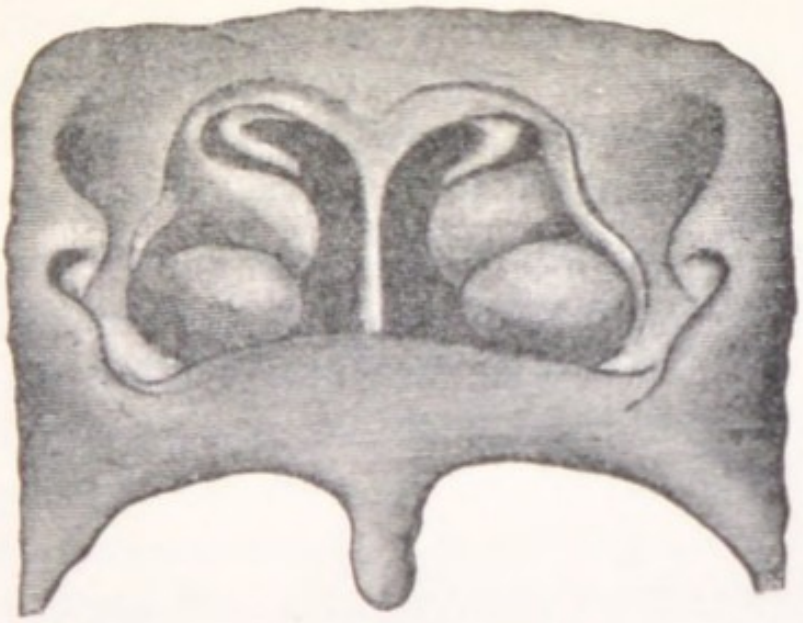

FIG. 1.

THE RHINOSCOPIC IMAGE (Lefferts).

The septum is a whitish band, narrow below, gradually widening as it extends upwards. It is

made up of the posterior rim of the vomer, covered by mucous membrane

On either side of the septum, two cavities are seen, the nasal fossæ. They connect the anterior and posterior nares through the medium of the inferior and middle meatuses.

The parts constituting the lateral portions of the picture are: the orifices of the Eustachian tubes, the superior middle and inferior turbinated bones, and the superior middle and inferior meatuses.

The orifices of the Eustachian tubes occupy the extreme right and left of the picture and look like puckering apertures in small elevated ridges of mucous membrane. The turbinated bones are the three ridges situated one above the other and separated by three corresponding spaces, the meatuses.

The mucous membrane of the posterior nasal cavity, which is continuous with that of the anterior cavities, is supplied with an immense number of small glands. These are of two kinds, conglomerate and follicular. The follicular glands are more abundant at the lower part of the vault of the pharynx. They are bundled together in a glandular mass, to which the appellation of pharyngeal tonsil has been given. The conglomerate glands are more abundant behind the eminences containing the orifices of the Eustachian tubes and on the superior surface of the velum.

CHAPTER II.

PHYSIOLOGY.

THE nasal fossæ may be considered as having three distinct offices to perform in the body:

First, they are the seat of the sense of smell.

Second, they constitute the portal of the respiratory organs.

Third, they are indispensable to the proper production of the voice.

The main peculiarity of the sense of smell consists in the fact that it gives us intelligence of the physical character of bodies in a gaseous or vaporous condition. Thus we are enabled to perceive the existence of an odorous substance at a distance, and when it is altogether concealed from sight. The minute quantity of volatile material emanating from it, and thus pervading the atmosphere, comes in contact with the mucous membrane of the nose, and produces a peculiar and special sensation.

The mucous membrane covering the upper and outer portion of the middle turbinated bones is soft, spongy, and very vascular, and is supplied with

mucous follicles which exude a secretion, by which its surface is protected and kept in a moist and sensitive condition.

This is the only portion of the mucous membrane of the nares which is supplied by filaments of the olfactory nerve, and is therefore capable of receiving the impressions of smell; hence its name, the olfactory membrane.

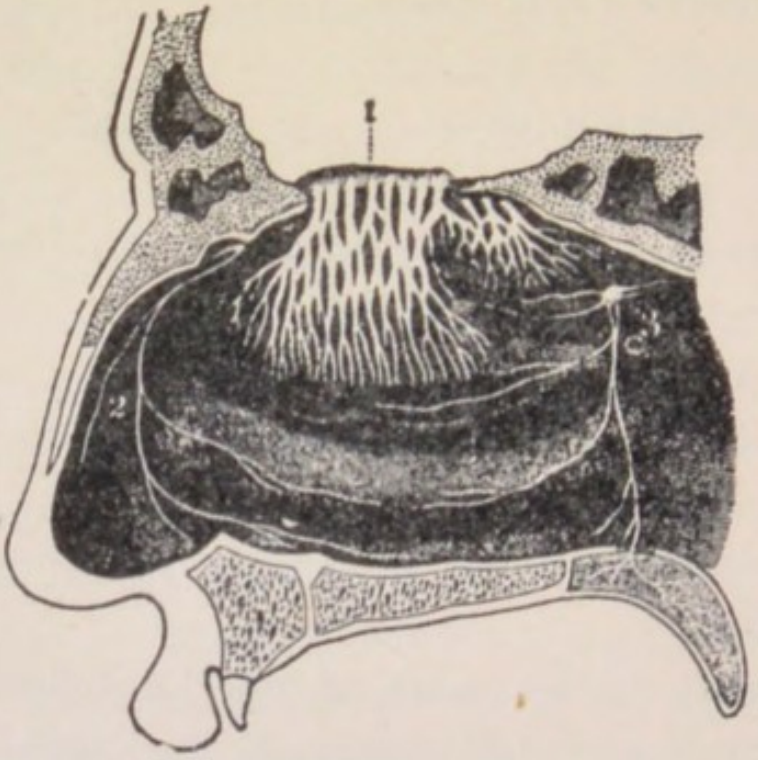

FIG. 2.
THE OLFACTORY NERVE.

The filaments derived from the olfactory ganglia, and which penetrate through the cribriform plate of the ethmoid, are distributed to the olfactory membrane, as illustrated in Fig. 2.

In order to produce an olfactory impression, the emanations must be drawn freely through the nasal passages.

To properly perform this important function the nerves must be in a healthy condition.

If the olfactory membrane be covered with thick and tenacious mucus, or if its character be pathologi-

cally altered, the sense of smell will be seriously compromised.

The importance of the nasal cavities in respiration cannot be overestimated. In passing through these canals three important changes take place in the inspiratory air current: its temperature becomes elevated to the proper degree for its reception into the lungs; it becomes moistened by contact with the nasal secretions; and it becomes freed from particles of dust or other injurious matter which might otherwise effect an entrance into the lower air passages. The alteration in temperature is due to the tortuous nature of the nasal passages, and to the great vascularity of their membranous lining.

The sifting of dust and other foreign particles is accomplished by the little hairs or vibrissæ with which the margins of the nostrils are so freely supplied.

Those particles which escape the vibrissæ have a tendency to become involved in the secretions of the cavities, and ejected by the peculiar action of the ciliated epithelium. Morbid conditions of the nares, by interfering with nasal respiration have an important etiological bearing upon pharyngeal and laryngeal affections.

This is more noticeable in instances of partial or complete occlusion, the sufferer therefrom being compelled to breathe either partially or wholly through the mouth.

The inhalation of cold air per orem more especially during the fall and winter months, is a direct cause of many throat affections.

The importance of overcoming "mouth-breathing" as a preliminary step to the treatment of all buccal and laryngeal inflammati ns is thoroughly appreciated by the skilled specialist of the present day.

The patency of the nasal passages is absolutely necessary to the proper production of the human voice, both in speaking and singing. Generally speaking, the nose is the resonator of the voice; its floor, the hard palate, playing the part of a sounding-board.

The voice is produced by the action of the air current, as it is forced through the chink of the glottis, causing a vibratory motion in the vocal cords. This vibratory movement divides the outpouring column of air into a large number of smaller columns, aptly called tone-waves. The pitch of the voice depends mainly upon the dimensions of the vocal bands and the amount of tension to which they are subjected. The intensity of the sound depends upon the force with which the air current is propelled against the vocal cords. The velum pendulum palati and its dependent uvula play a most important part in the production of the human voice.

The soft palate is composed of muscular tissue covered with mucous membrane, and is freely movable upwards and downwards. It is this property of

free motion which enables the velum to play an important part in vocalization. The tone-waves, in their journey from the body, pursue three different courses—viz., through the mouth alone, through the nose alone, and through the mouth and nose combined.

The direction which each wave takes depends entirely upon its position in the voice register.

During the vocalization of sounds that pass through the nose alone the palate rests throughout its entire extent upon the dorsum of the tongue, thus making one continuous musical tube terminating at the anterior nares.

During the intonation of sounds that pass through the mouth alone, the velum is pressed tightly against the pharyngeal wall, thus cutting off all communication between the buccal and posterior nasal cavities.

During the singing of tones that issue in the same degree from both nose and mouth, the pendulous velum is posed in the back of the mouth at an equal distance from the tongue and pharynx.

The Action of the Uvula.—The physiological action of the azygos uvulæ is absolutely necessary to the proper performance of these three important movements of the soft palate.

When the velum is pressed against the dorsum of the tongue the uvula lies dormant on the upper surface of the lingual organ; when, however, the palate begins to rise, the uvula, which has hitherto been in-

active, stretches itself suddenly and becomes an active participant. As the velum recedes from the tongue, the attached uvula rises and accompanies it in its journey upwards until finally its tip end only touches the back of the lingual organ.

When this point is arrived at, the velum occupies a midway position between the back of the tongue and the pharyngeal wall, a position hitherto alluded to where the vocal tones issue in the same degree from both nose and mouth. At about this time, as the vocalist proceeds in the ascending scale, the uvula is seen to be drawn speedily upwards. If you should place the rhinoscopic mouth mirror behind the velum, and watch the posterior surface of this organ during the above action, you would see that, as the uvula is drawn upwards, a prominence appears on the portion of the velum under observation, which reaches its maximum when the uvula is drawn upwards to its fullest extent.

What significance has this peculiar action? Why, the instant the uvula leaves the tongue, the prominence above described touches the pharyngeal wall, so that at no time is the velum free from the guardianship of the uvula. If the velum were to be deprived of the assistantship of the uvula it would lose its basis of support, and, losing this, would be acted upon in a vibratory manner by the air currents.

This action would impair vocal tones by imparting an undue amount of tremulousness to the voice.

CHAPTER III.

ARMAMENTARIUM AND METHODS OF EXAMINATION.

THE instruments necessary to the exploration of the nasal cavities are three in number: the rhinoscope, the nasal speculum, and the tongue depressor.

The rhinoscope is a combination of three distinct appliances: the illuminator, the reflector or head mirror, and the mouth mirror.

The illuminator is a lantern-like attachment so constructed as to be readily adjusted to the gas-bracket or lamp.

When gas is employed, Dr. Mackenzie's bull's-eye condenser is by far the best.

It consists of a cylinder of metal to which is affixed at a point opposite the jet of flame a short arm containing a powerful lens. Mackenzie's condenser is made to fit an ordinary argand burner, and employed with such gives a most powerful light. An excellent form of bracket, which is readily adjustable to any position, and which was designed especially by Dr. Mackenzie for his illuminator, is illustrated in Fig. 3.

When gas is not procurable, Tobold's condenser is the better instrument (Fig. 4).

It is composed of a long, funnel-shaped tube, armed with three lenses, placed one at the distal extremity and two near the light.

It is attached to an ordinary student's lamp by means of a short arm, which is held firmly in position by a thumb-screw.

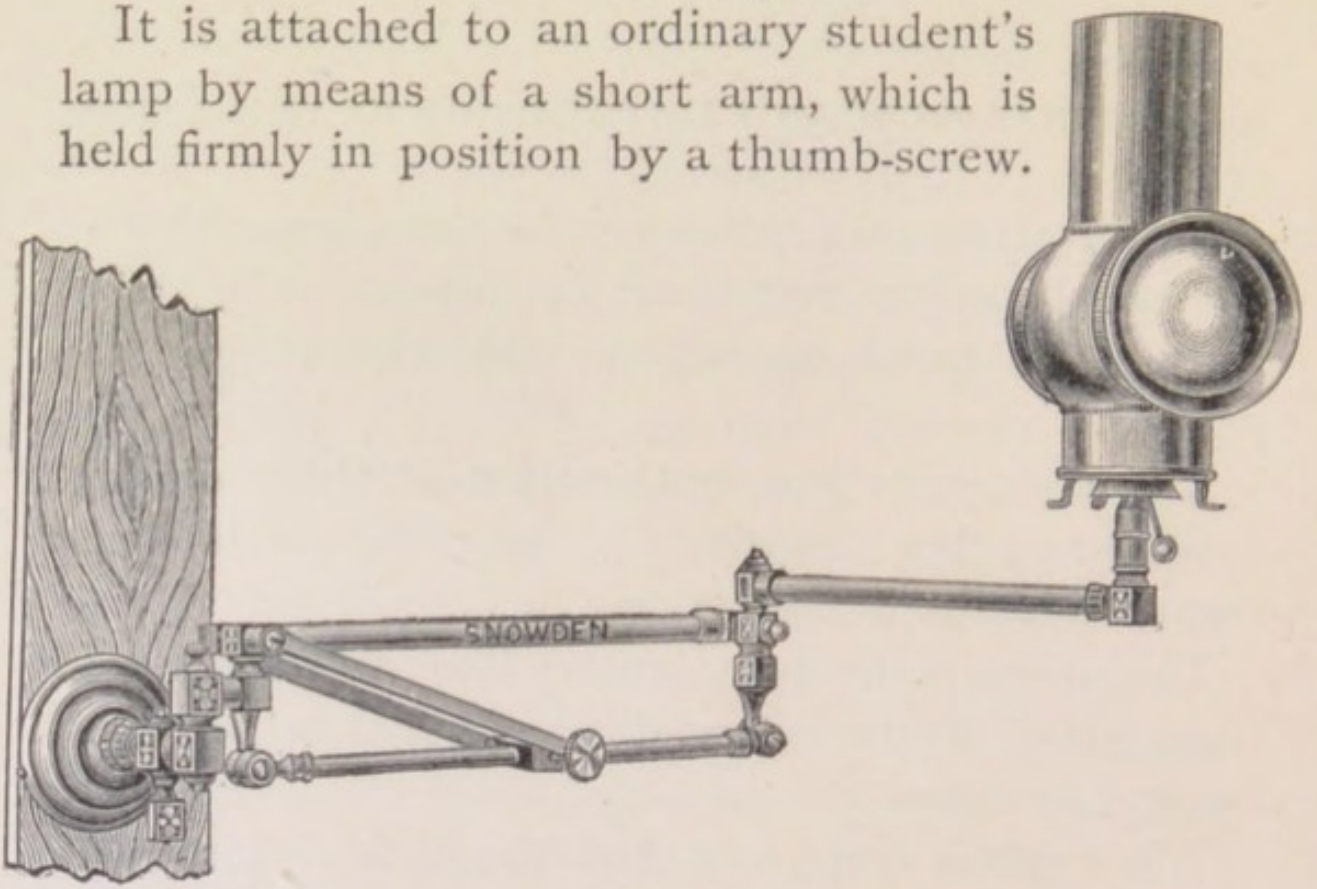

FIG. 3.

IMPROVED MACKENZIE ILLUMINATOR AND ADJUSTABLE BRACKET.

The head mirror or reflector is a simple concave mirror of circular form, perforated in the centre and set in a strong metal frame. The reflector is attached to a head-band by means of a ball-and-socket joint, which admits of perfect movement in any direction. An excellent head-band and protector is illustrated on page 18, Fig. 5.

The liability to breakage, which will frequently happen when carried loosely in the pocket, is completely removed by the employment of this device.

Many laryngoscopists recommend the attachment

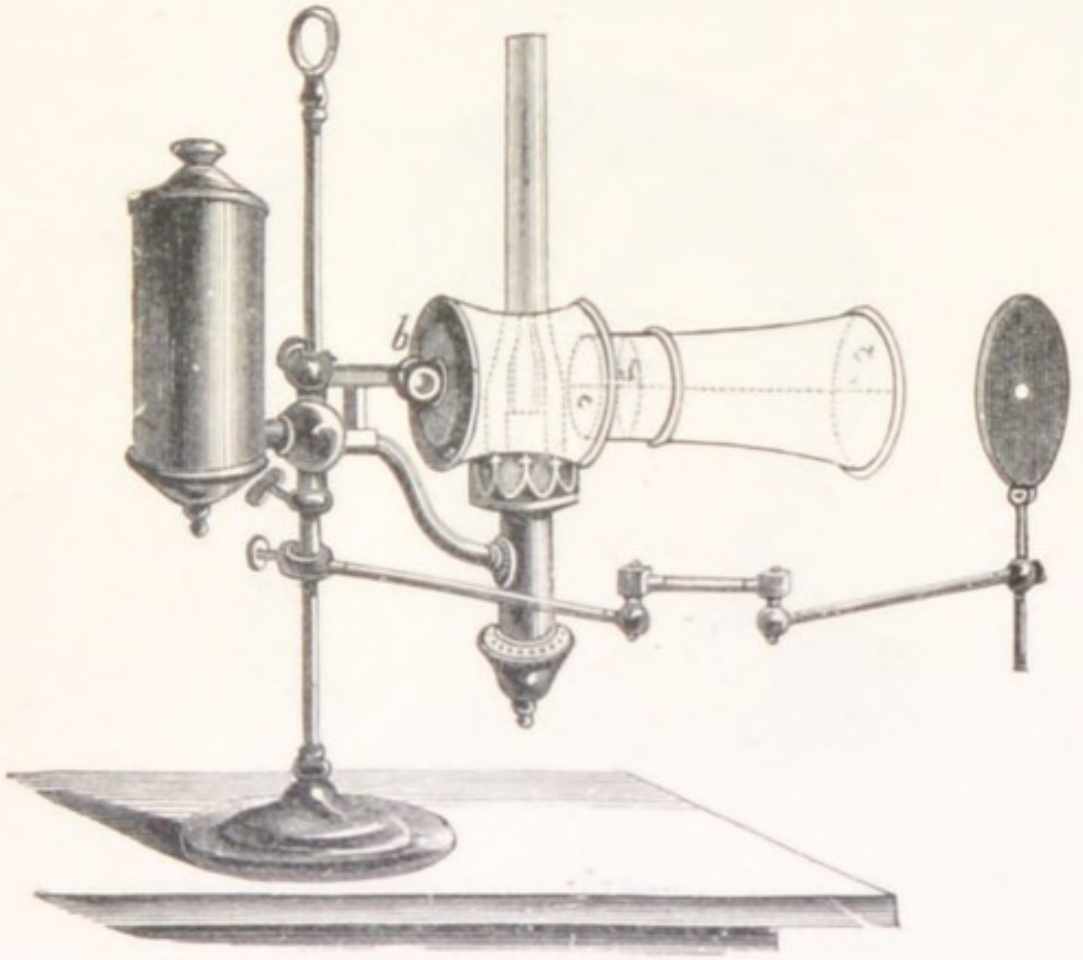

FIG. 4.

TOBOLD'S ILLUMINATING APPARATUS.

of the head-mirror to the illuminator, as shown in Fig. 4. This is an inconvenient way of making examinations, especially in nervous patients, as it requires a too frequent adjustment of the attached head-mirror.

To those who are constantly using the laryngoscope, I highly recommend the spectacle-frame attachment. It is much lighter, and consequently less irksome than the ordinary constricting head-band.

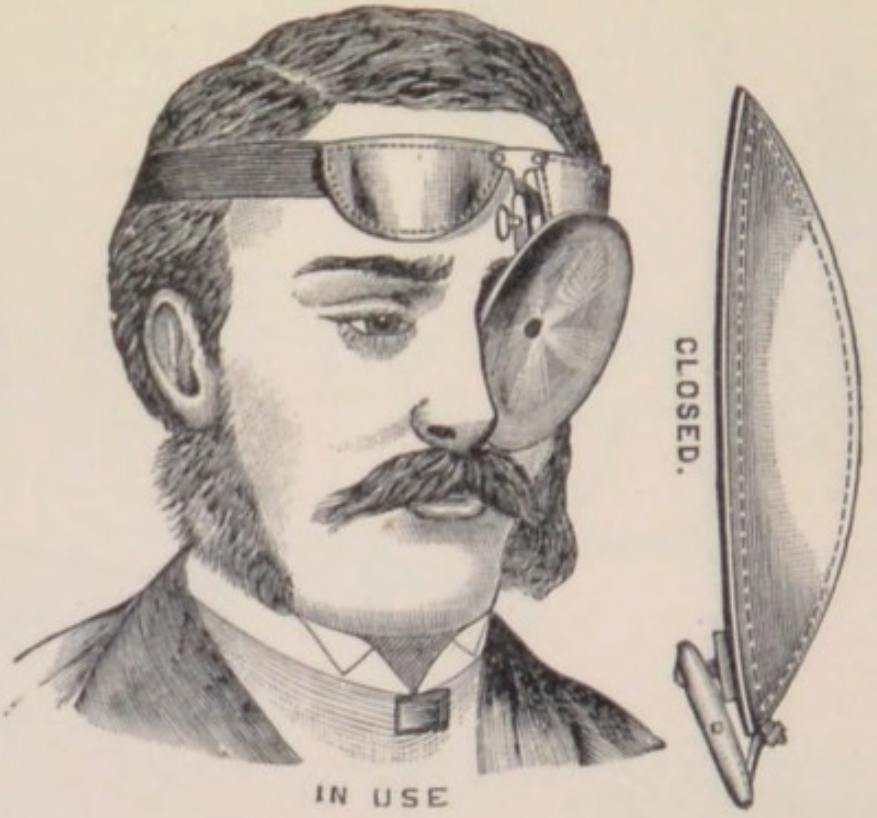

FIG. 5.

SANDY'S MIRROR AND HEAD-BAND.

The mouth-mirror consists of a circular piece of looking-glass set in a metal frame, to which is attached a stout shank and handle (Fig. 6).

The diameter of the mirror employed in posterior nasal examinations is from $\frac{1}{2}$ to $\frac{5}{8}$ of an inch.

In using the posterior nasal mouth-mirror the shank should be slightly arched upwards, in order

that the hand holding it may be out of the line of vision.

The nasal speculum is an instrument intended to dilate the anterior nares sufficiently to admit of the illumination of the cavities beyond.

The proper dilatation of the nostrils, although apparently a simple operation, oftentimes requires the exhibition of a considerable amount of skill.

The method of manipulation universally approved of, is to introduce the speculum about one quarter to one half an inch into the nostril in such a manner that when opened one blade will press against the septum while the other impinges against the outer wing.

This method of examination, although satisfactory in many cases, is susceptible of great improvement. For the past few months I have employed a form of dilatation which has proved highly satisfactory, especially when a prolonged distention of the nostrils was necessary.

The instrument employed in this method of dilatation consists of a double-armed speculum, to which is affixed, in such a manner that it can easily slide up and down, a third arm.

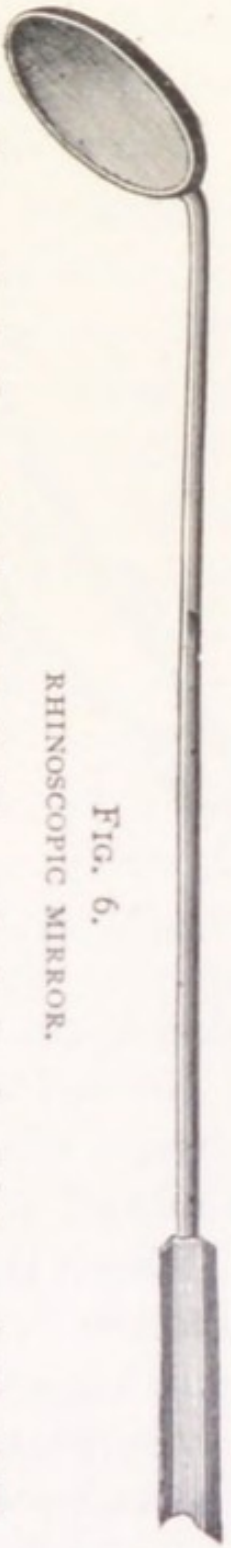

FIG. 6.
RHINOSCOPIC MIRROR.

In the manipulation of this instrument it should be held in a horizontal position with reference to the face, and when introduced form a right angle with the nose.

When thus introduced the upper angle of the nose is pressed against by one arm, the lower angle by the opposite arm, while the third or sliding arm distends the outer ala. The three arms are narrow and straight and sufficiently long to pass well into the nares.

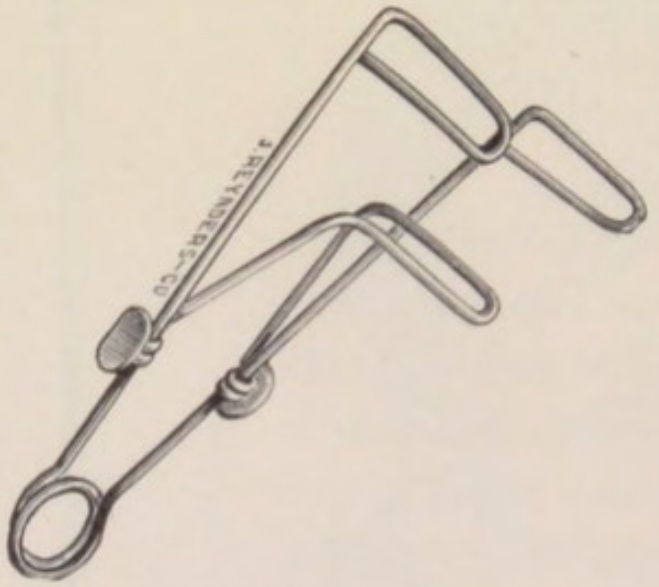

FIG. 7.
THE AUTHOR'S NASAL SPECULUM.

There are several decided advantages gained by this method of nasal dilatation:

First, the septum being fixed, all the distendable parts of the opening are taken advantage of.

Second, direct pressure on the septum, which is always more or less disagreeable, if not painful, is avoided.

Third, the instrument admitting of a deep introduction is self-retaining, the sliding attachment remaining in any set position; and

Fourth, the spring of the dilator being fully under the control of the sliding blade, pain from undue pressure is effectually avoided.

The tongue depressor is used to hold down the lingual organ during an examination of the interior of the mouth and posterior nasal cavities.

Of the many varieties of depressors recommended Turck's is the most generally useful.

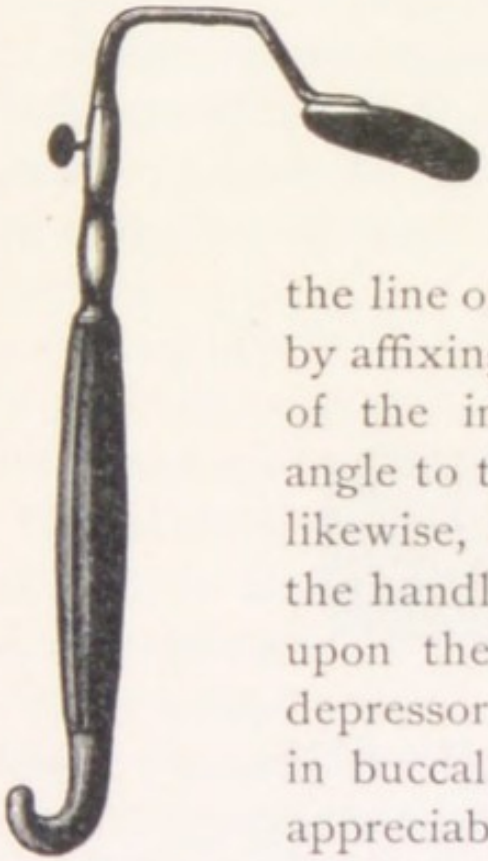

FIG. 8.
TURCK'S TONGUE DEPRESSOR.

The chief point of advantage possessed by this instrument lies in the fact that when in situ the hand in which it is held is without the line of vision. This is accomplished by affixing the blade or spatula portion of the instrument at almost a right angle to the handle. The operator can likewise, on account of the length of the handle, exert a great deal of power upon the base of the organ with this depressor. This is an important factor in buccal exploration, and thoroughly appreciable to those accustomed to working in this region.

Within the past few years electricity, as a means of illuminating hidden recesses of the body, has been demonstrated as perfectly practicable.

Up to the present writing two methods have been perfected, namely, the electric lantern and the electric mouth-mirror.

The electric head-lantern consists of an electric lamp,

of about a four-candle power, confined in a circular box into which is screwed a circular tube containing a set of lenses. This contrivance is fastened by an ordinary ball-and-socket joint to the regular head-band.

The electric mouth-mirror consists of a minute electric lamp, of from one- to two-candle power, mounted on a hard-rubber handle, and to which an ordinary small mirror can be adjusted at any desired distance.

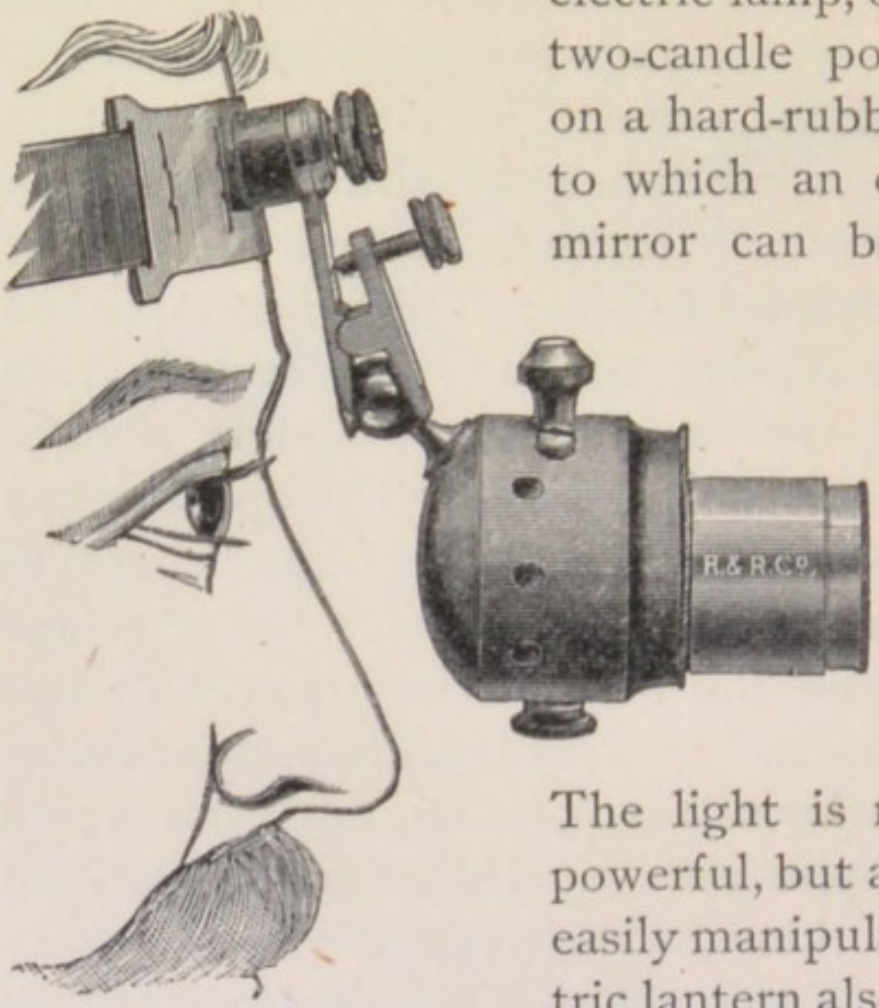

FIG. 9.

THE ELECTRIC HEAD-LANTERN.

Of these methods of illumination, the former is the most generally useful. The light is not only more powerful, but also much more easily manipulated. The electric lantern also admits of the illumination of the anterior nasal cavities.

There are very many styles of batteries that can be successfully employed in running these electrical contrivances.

In cities where a re-charging is practical, storage batteries are the most serviceable.

If located in regions not supplied with electric power, an ordinary three- or four-cell plunge battery, charged with the regular cautery solution (potass. bichrom., ℥ iiiss.; acid. sulphuric., lb.i.; aquæ, Oii.), will answer very well.

With careful handling, from one hundred to one hundred and fifty examinations can be made without a renewal of the acid solution.

FIG. 10.
THE ELECTRIC ILLUMINATOR.

METHODS OF EXAMINATION.

The exploration of the anterior nasal cavity is generally an easy operation. The head of the patient being thrown well back, and the nostril well dilated, the lumen of the rhinoscope can be made to penetrate deeply, provided there be no obstruction. The exploration of the posterior nares is oftentimes a difficult operation, and always requires the exhibition of a great amount of skill in the handling of the instruments. The first step of the operation is the introduction of the tongue depressor. This instrument should be firmly grasped in the left hand, introduced well into the mouth, and placed upon the dorsum of the tongue, while the organ is

resting quietly in the floor of the mouth. In some cases the weight of the spatula will create sufficient

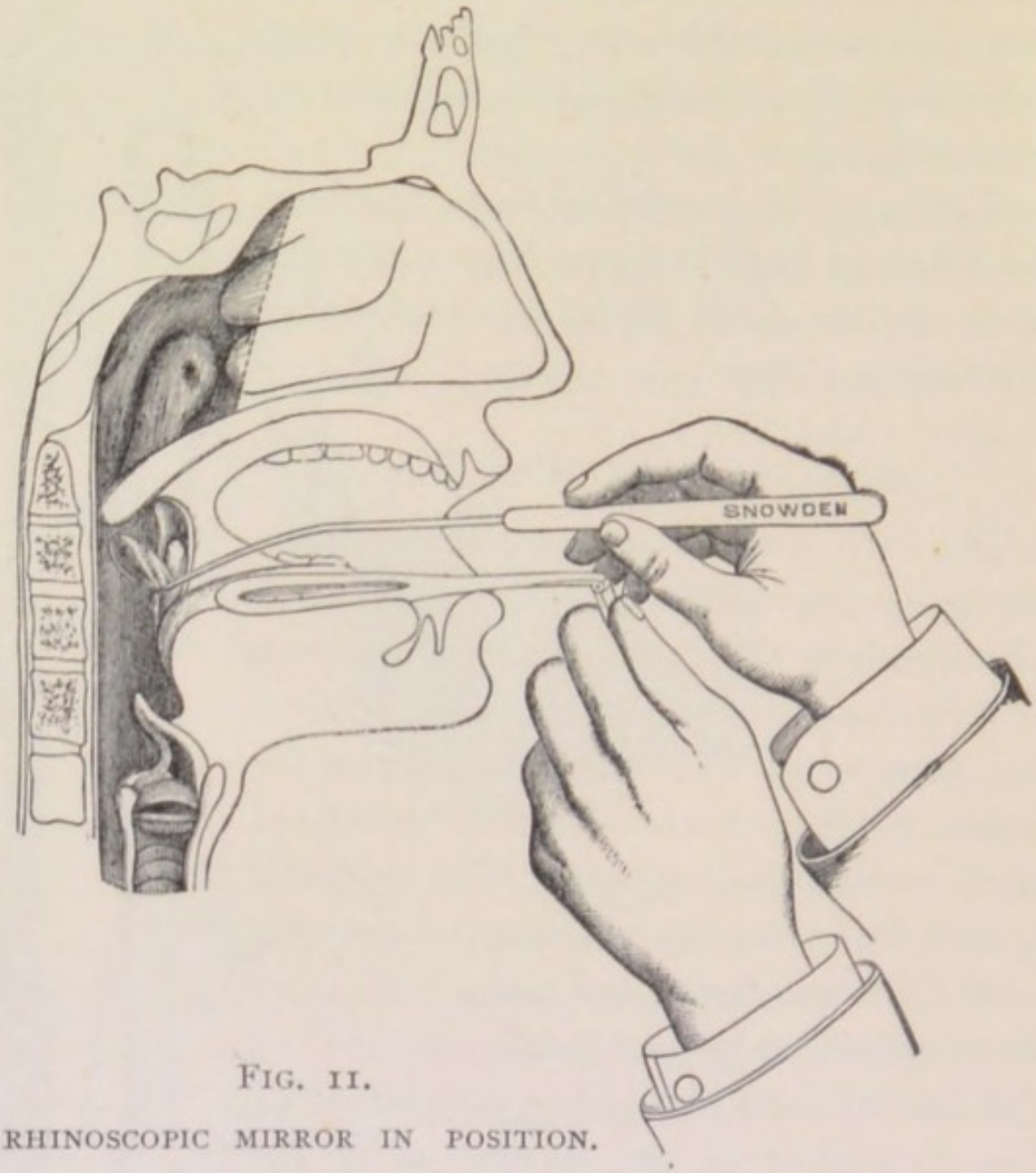

FIG. 11.

RHINOSCOPIC MIRROR IN POSITION.

space to admit of the proper manipulation of the mouth-mirror; but in others, however, the base of the lingual organ must be greatly depressed before a posterier nasal examination can be accomplished.

In the introduction of the depressor, care should be taken that it be not carried back too far into the buccal cavity, to avoid spasmodic muscular contraction, which a careless manipulation of the instrument will generally create.

After the tongue has been properly depressed, and the rays of light from the illuminator have been deflected into the mouth of the patient, the introduction of the mouth-mirror is in order. The rhinoscopic mouth-mirror, held between the thumb and forefinger, like a pen, is gently heated, and quickly passed, with its reflecting surface looking upward, into the mouth, and carried immediately beyond the dependent velum.

During the passage of the little mirror, care should be taken not to impinge against the velum or uvula, as a contraction of these parts may thereby be excited, and destroy the chances of an examination.

When the mirror has arrived at the palato-pharyngeal space, its reflecting portion can be easily posed at the proper angle to reflect the posterior nasal cavity.

OBSTACLES TO EXAMINATION.

Irritability of the fauces will offer the greatest obstacle to a successful examination of the posterior nares. In order to obtain a perfect view of these parts the velum must hang perfectly quiet, forming, as it were, a right-angle with the hard palate.

When the velum is in an irritable condition, every attempt to pass the mirror beyond it will be characterized by spasmodic muscular contraction.

The sensitiveness is oftentimes so marked that the slightest pressure upon the base of the tongue will be instantly followed by a violent uplifting of its tissues, thereby completely obliterating the palato-pharyngeal space.

To overcome faucial irritability, a thorough spraying of the parts with a four-per-cent. solution of cocaine will answer admirably.

In cases where a prolonged examination is necessary, and also in operations of the posterior nasal region, an excellent device to overcome irritability is to pull forward the velum by means of pieces of tape or string passed through the nose and drawn out of the mouth. To perform this little operation, attach the string or tape to the eye of a small-sized urethral bougie devoid of its directing rod, insert the instrument thus armed into either nostril, and push it gently backward along the floor of the nose until you can see it protruding into the mouth beyond the soft palate. When the bougie has arrived at this latter position, grasp the string with an ordinary long pair of forceps and draw it out of the mouth, at the same time withdrawing the bougie. The next and final step is to tie the two ends of the tape tightly over the upper lip, or around the ear located on the same side through which the string was passed.

When this operation is repeated on the opposite side, the velum will be held firmly in position and the palato-pharyngeal space greatly enlarged.

The many peculiar deformities so frequently met with in tertiary syphilis of the mouth offer serious obstacles to posterior rhinoscopy. In some instances the velum is united throughout its entire free border to the wall of the pharynx, entirely obliterating the palato-pharyngeal space. Again, this body may be so contracted and distorted by the healing of the specific ulcerations as to render an observation of the parts beyond an utter impossibility.

Other morbid conditions in this locality, such as enlarged tonsils or an œdematous uvula, by occupying the space necessary to the proper manipulation of the mouth-mirror, oftentimes prove impediments to rhinoscopy.

Several instruments called palate elevators, or hooks, have been designed for the purpose of lifting up or pulling forward the velum and uvula, and thus permitting a more extended view of the parts beyond. These instruments, except, possibly, those intended to act on the uvula alone, have very little practical value; in fact, their use generally serves to render more excitable an already irritable organ.

The conditions which are apt to present themselves as obstacles to the exploration of the anterior nasal cavities are three in number: hypertrophy of the

mucous membrane, deviation of the septum, and syphilitic contractions.

The mucous membrane covering the turbinated bones and septum nasi is frequently found so thickened by diseased action as to completely shut out from view the organs beyond.

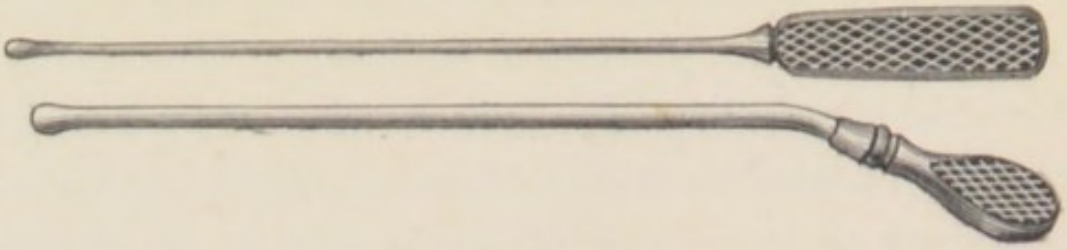

FIG 12.

NASAL PROBES.

When the hypertrophied tissues are soft they can be easily pressed aside sufficiently to admit of a view of the parts beyond, by means of the nasal probe, which is an ordinary exploring probe flattened at its distal extremity.

In cases of denser hypertrophies, deviation of the septum, or syphilitic contraction, surgical interference must be invoked before anterior rhinoscopy can be accomplished.

CHAPTER IV.

METHODS OF TREATMENT.

THE several methods of treating the nasal organs may be divided into two classes, namely: those employed by the physician in his regular applications, and those made use of by the patient in his home treatment.

The methods of treatment at the disposal of the physician are four in number, viz.: spray applications, insufflation, the application of medicated solutions on little camel's-hair brushes or cotton-wrapped probes, and the use of medicated bougies.

The first of the above-mentioned plans of treatment consists in the injection of medicated solutions in the form of a fine spray.

This method, which is by far the most generally useful in the treatment of inflammatory affections of the nasal organs, is performed by means of a set of instruments called the compressed-air spray apparatus.

This apparatus consists of three distinct instruments: the force pump, by which the air is com-

pressed in the receiver; the receiver, in which the air is stored; and the spray tube.

For the general practitioner, who but occasionally uses this method of treatment, an ordinary plumber's force pump (Fig. 13) will answer every requisite.

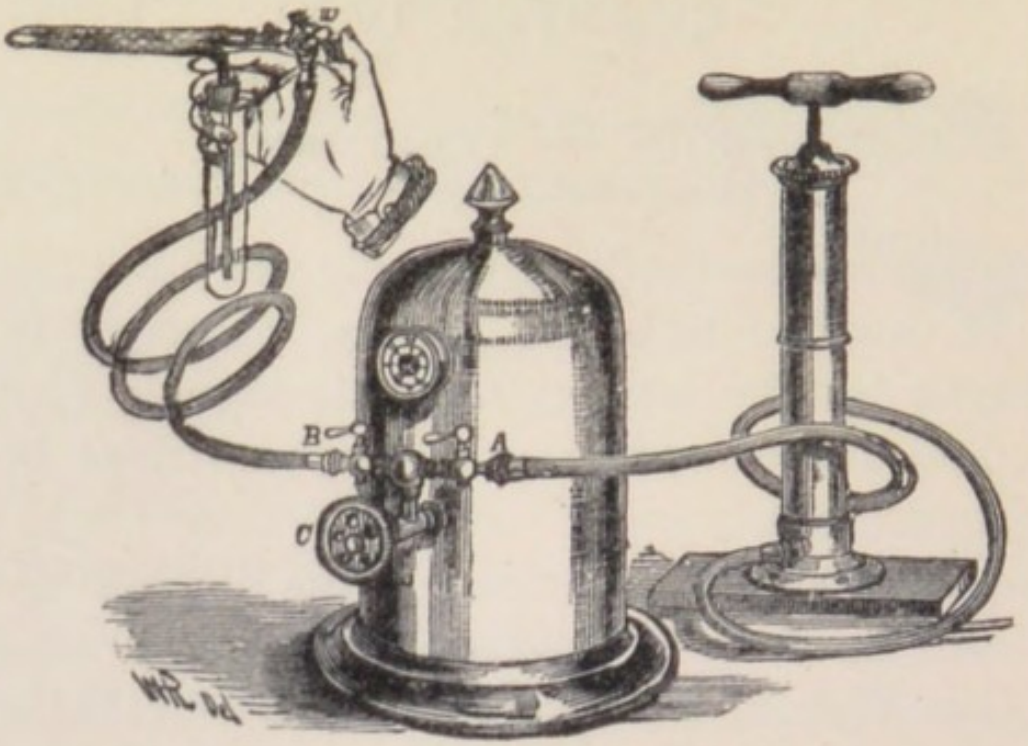

FIG. 13.

COMPRESSED-AIR SPRAY APPARATUS.

To the specialist, however, on account of the labor entailed in working this form of pump, some other device will be necessary.

Sass' pump will be found an excellent and convenient instrument for this purpose.

The momentum gained by the size and weight of the fly-wheel renders its manipulation exceedingly easy.

There have been recently invented several desira-

ble electric and water motors for the running of compressed-air pumps. These devices are, however,

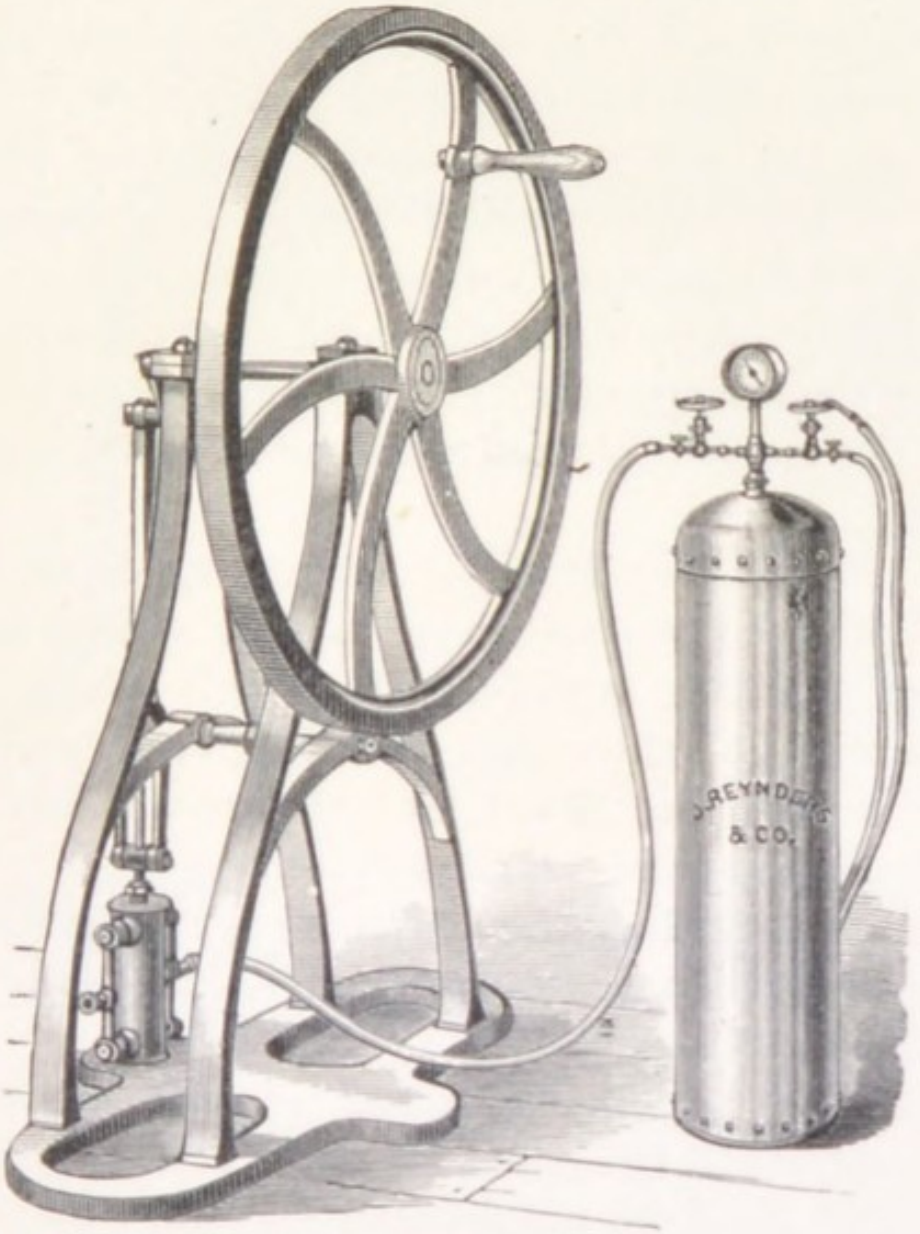

FIG. 14.
SASS' PUMPS.

quite expensive, and their use warranted only when a great amount of compressed air is required.

I have used for some time a simple form of water

power, suggested to me by Dr. Graeme Hammond, of New York.

This device consists in attaching the receiver directly to a water faucet, the ordinary water-pressure being utilized as the motor power.

When the water rises about half-way in the receiver, the air contained therein is compressed sufficiently to produce quite a forcible spray. The only disadvantage about this method of compression is, that the operation of spraying must be suspended when the receiver is filled with water, to allow of its running off.

The air receiver is an ordinary copper or steel boiler, and can be constructed by any skilled metal-worker. In the manufacture of this instrument, care should be taken that all the different parts be firmly riveted, and that it be tested to not less than one hundred pounds to the square inch.

When other than the plumber's pump is used, a gauge should always be attached to the receiver to prevent overcharging.

Whenever the physician has occasion to use the spray outside of the office, the soft-rubber hand-ball apparatus must be substituted for the pump and receiver.

Spray tubes are constructed of several different materials and in several different designs.

That form of spray tubes constructed of glass and invented by Dr. Sass (Fig. 15), is pre-eminently the

best. Each instrument consists of two tubes cemented together and placed one above the other.

The distal ends of these tubes are fine and pointed, and so arranged that air forced through the upper tube will exhaust that contained in the lower

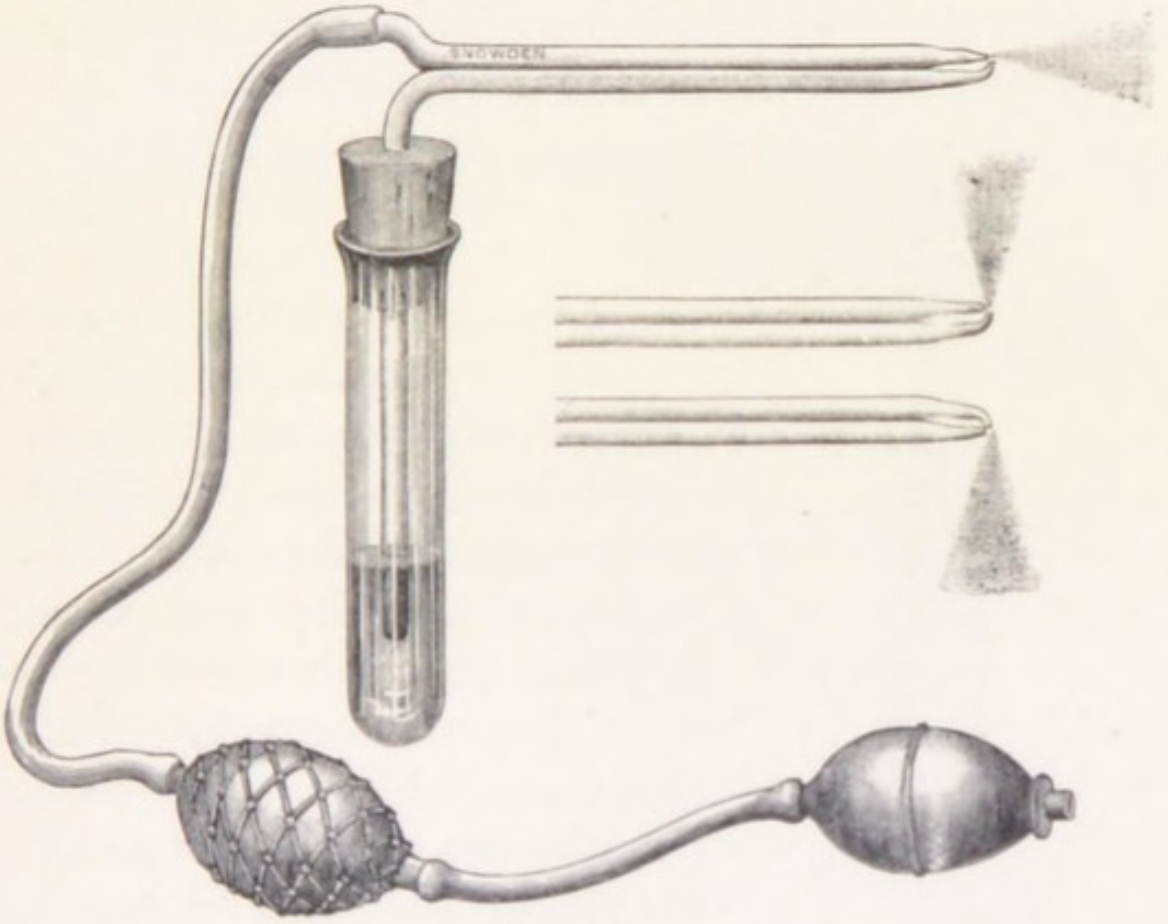

FIG. 15.

HAND-BALL SPRAY APPARATUS AND SASS' TUBES.

one, the vacuum thus produced causing the liquid to rise and issue in the form of a fine spray. Sass' tubes are also manufactured of hard rubber and metal. In general practice, the necessity often arising to carry a spray apparatus from house to house, the above two forms of spray tubes are to be pre-

ferred to the glass ones, on account of the danger of breakage in the latter.

The spray tubes and receiver are connected by means of rubber tubing. The tubing can be slipped over the end of the upper tube of Sass' spray, or it can be attached thereto by means of an exceedingly convenient little device, the automatic cut-off.

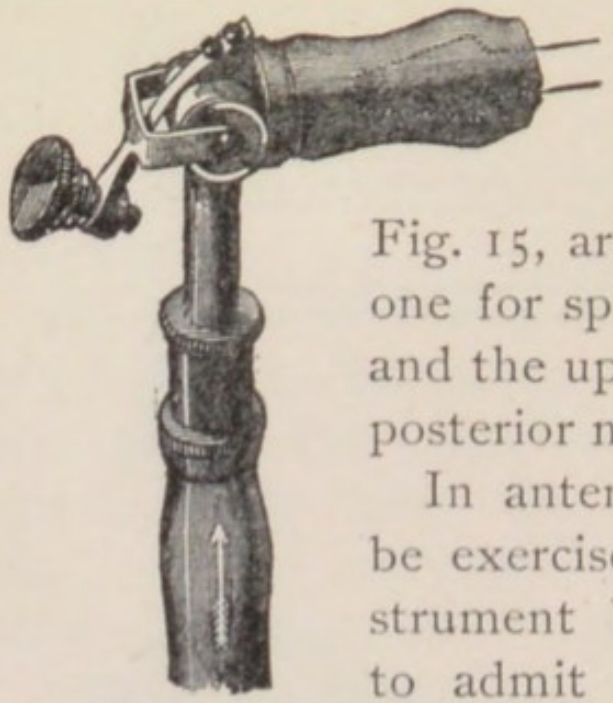

FIG. 16.
AUTOMATIC CUT-OFF.

In the medication of the nasal fossæ two only of the three forms of spray tubes, illustrated in Fig. 15, are applicable; the straight one for spraying the anterior nares, and the upward one for spraying the posterior nasal cavities.

In anterior spraying care should be exercised that the tip of the instrument be sufficiently introduced to admit of the solution passing deeply into the cavities.

The manipulator should also be careful not to impinge on the mucous lining of the canals, as bleeding is exceedingly liable to be excited thereby.

There are several pathological conditions, as septal deviation, nasal polypi, or membranous hypertrophy, which will greatly interfere with anterior spraying, and the surgeon should insist upon the removal of these obstructions, as absolutely necessary to suc-

cessful treatment. In making spray applications to the posterior nasal cavities, the tongue is depressed in the same manner as in the examination of this locality, and the upward spray tube carefully introduced between the uvula and outer wall of the mouth in such a manner that its tip be located about midway between the velum and posterior wall of the pharynx. In some instances, when the dimensions of the palato-pharyngeal space are small, the aperture can be greatly enlarged by directing the patient to make prolonged and forcible inspiratory efforts through the anterior nares.

FIG. 17.
NASAL INSUFFLATOR.

This manœuvre will not only admit of a more thorough spraying of the parts, but will oftentimes be a decided aid in their exploration.

Insufflation is the blowing of medicated powders into diseased cavities.

The nasal insufflator consists of a hard-rubber tube, which may be bent in any direction, and

which is to be tightly fitted to the bottle or test-tube containing the powder. The air travels through a distinct passage into the bottle, and the powder is thus stirred up and forced through the tube.

When this instrument is connected with the compressed-air apparatus by means of the automatic cut-off a most perfect and efficient insufflator is obtained.

In insufflation of the posterior nares the attachment of the powder-blower to the compressed-air apparatus is a decided advantage, since its manipulation requires but one hand, the other being left free to control the tongue with the spatula. Insufflation, although not employed as frequently as some of the other varieties of medication, is an excellent method of treating some forms of nasal inflammation.

Before its employment great care should be taken to thoroughly cleanse by spraying the cavities which are to be treated. It may be aptly stated here that no medicine, no matter how meritorious it may be, will be productive of any beneficial result unless the parts to which it is applied be thoroughly cleansed.

The application of medicated solutions by means of camel's-hair brushes or probes armed with little pledgets of cotton probably antedates either of the methods previously alluded to. In making nasal applications the brush treatment can only be used in the posterior cavity, hence the instrument used is called the post-nasal brush. Although brush appli-

cations are useful in making post-nasal applications, the danger of contagion is always present, and therefore most specialists have discarded this method of treatment.

The application of medicated solutions through the agency of absorbent cotton is by far the cleanest and most satisfactory method of treatment at our disposal.

In making applications to the anterior nares an ordinary straight probe or flexible wire of silver, copper, or brass, about eight inches in length, will answer for all practical purposes. The cotton should be arranged in a thin layer about one half inch wide and one to two inches long, and affixed tightly to the probe by revolving the instrument.

The flattening or serrating of the distal extremity of the probe or wire is entirely unnecessary, as there is not the least danger of losing the cotton pledget if it is wrapped sufficiently tight.

The removal of the cotton from a roughened or flattened probe is a difficult matter, whereas the mass can be slipped off the smooth instrument most readily with the napkin.

In making posterior applications silver, brass, or copper wire, bent at about an inch from its extremity to a little more than a right angle, and armed with cotton, will be extremely serviceable. In applying the cotton pledget anteriorly it should be first passed through the lower meatus as far as it will go and

then applied to the membranes covering the superior and middle turbinated bones and the upper portion of the septum as thoroughly as possible. In making the posterior application the instrument should be introduced with its curved extremity parallel to the lips, and thus carried back to the palato-pharyngeal space, when it must be revolved from one side to the other and pushed upward as far as possible.

In making posterior applications the pledget of cotton should be much thicker than when applied to the anterior nasal cavities, on account of the large surface to be treated.

Medicated bougies have been highly extolled by many writers, and in some forms of nasal inflammation are of undoubted service. The best variety are those constructed of gelatine, to which has been added some of the mineral and vegetable astringents.

Their principal efficacy lies in the fact that the medicament which is incorporated in them is kept in contact with the diseased membrane while the dissolving process is going on. The only objection to their use is that for a considerable time after application an annoying discharge is kept up by the melting of their ingredients.

The methods of treatment employed by the patient himself, as auxiliary to the endeavors of his physician, are three in number, viz.: the cleansing of the nasal cavities, the snuffing or insufflation of medicated powders, and steam inhalations.

As a cleansing instrument the nasal douche is first and foremost in popularity. I am not in favor of this instrument, and discourage its use whenever possible.

My objections are the same as those of many other specialists, and lie principally in the fact that it has a tendency to produce aural complications, by the forcing of the liquids into the Eustachian tubes. The solutions falling from a height, it is impossible to regulate the force with which they pass through the nasal cavities, hence the parts are deluged with the medicament, some portion of which is bound to be forced into the aural tubes. An excellent instrument for the patient's use in cleansing the nose consists of an ordinary soft-rubber injection syringe, to which is attached by means of rubber a pair of glass nasal canulæ.

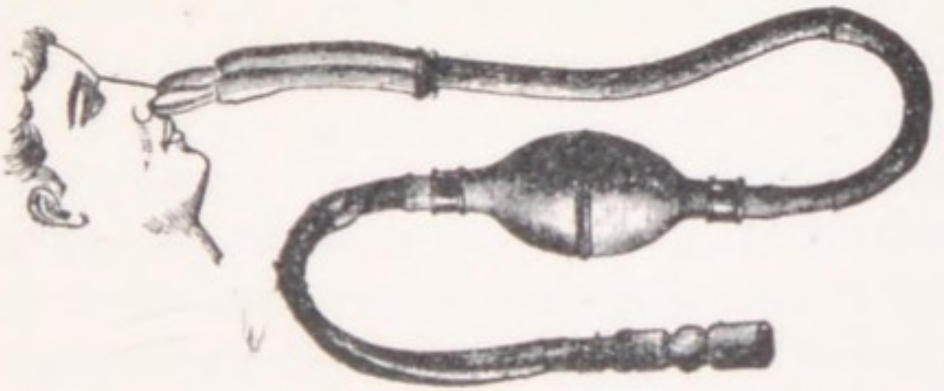

FIG 18.

AUTHOR'S NASAL SYRINGE.

In using this apparatus, first exhaust the air in the syringe by inserting the extremities well into the solution and compressing the bulb, then insert the

canulæ well into the nostrils and force a steady and quiet stream through the canals by a succession of gentle compressions. In this manner a large quantity of the solution can be forced through the nasal cavities, and the parts thoroughly washed out without incurring the least possibility of injury to the nasal fossæ or communicating structures.

Medicated powders can generally be easily introduced into the nasal organs by the patient by the simple act of snuffing.

In this little operation the patient gathers up between the thumb and forefinger as much as he can conveniently hold of the powder, and inserting them into the nostrils as far as possible, makes a forcible inspiratory act, drawing in as much as possible.

Should the patient experience any difficulty in performing the above operation, he must resort to some one of the many appliances designed for that purpose.

An exceedingly simple and inexpensive auto-insufflator can be constructed by the patient himself out of a piece of straight glass tubing about four or five inches in length, over the end of which a piece of rubber tubing of the same dimensions is slipped. The mouth-piece can be constructed of a shorter piece of the same-sized glass tubing, which must be inserted in and firmly tied to the free end of the rubber. To load the insufflator, slip off the rubber tube from the longest piece of glass rod,

force the glass end thus disunited well into the powder receptacle, and withdraw it, when sufficient of the medicine will be found in the tube to admit of a good application. The instrument is then to be reunited, the distal extremity inserted well into the nostril, and the powder forced into the cavity by blowing gently through the mouth-piece. The use of hard-rubber or glass-piston syringes should be always discouraged. They are not only inefficient, but their employment, especially the post-nasal variety, is almost certain to be followed by a certain degree of irritation.

The inhalation of medicated steam in some of the acute forms of nasal inflammation is exceedingly grateful.

I have used for several years an inexpensive instrument, which answers all the practical purposes of an inhaler, both for the nares and larynx. It is made of tin, and consists of an ordinary quart pail, provided with a shoulder, into which is fitted a second and much smaller pail, provided with a cone-shaped covering or hood armed with a mouth-shield. The entire apparatus can be constructed by any tin-smith at a trifling cost. The mouth-shield, made of tin and protected by chamois, must be made in such a shape as to cover the mouth and tip of the nose. In nasal inhalations, if the mouth is tightly closed, the gaseous vapors will permeate every portion of the nasal fossæ.

In the above form of inhaler, the outer pail is to be filled about one-third full of boiling water, just prior to the filling of the inner receptacle with the inhalatory solution. This keeps up the temperature of the fluid and allows of a much longer inhalation.

CHAPTER V.

ACUTE CORYZA.

INFLAMMATORY affections of the nasal fossæ are exceedingly prevalent in this section of the globe, not only on account of fickleness of climate, but also on account of the moisture with which the atmosphere is impregnated.

The vast numbers of foreigners who are continually coming to this country from more equable climates contribute largely to these cases.

The wearing of seal-skin garments, and the habit of over-bundling supposed weak portions of the body with clothes, are likewise prime causes of the great prevalence of catarrhal affections of the air passages.

Inflammatory affections of the nasal organs present themselves in six different forms, namely: acute coryza, chronic coryza, nasal catarrh, atrophic nasal catarrh, strumous rhinitis, and syphilitic rhinitis.

The first four of these affections are, undoubtedly, kindred diseases, since the etiology of each is largely due to the non-removal of its predecessor.

Thus an uncured acute coryza will develop into the chronic form of the disease, and a continuance of chronic coryza be productive of nasal catarrh. I do not wish to be understood as advancing the theory that every neglected case of acute coryza will eventually result in atrophic catarrh, but simply that there is a certain liability to such a contingency.

If physicians in general would embrace this idea, and impress upon the laity the importance of paying greater attention to acute inflammations of the nose, chronic catarrh would not be near so prevalent as it is at the present date.

ACUTE CORYZA.

Definition.—An acute inflammation of the mucous membrane lining the nasal cavities.

Etiology.—Exposure to cold, particularly when the body is overheated; inhalation of irritating vapors, or emanations from certain poisonous drugs; and previous attacks, are the principal causes of this affection.

When the body is in an overheated condition, "cold" is contracted, by the sudden checking of the perspiratory action, which causes the blood to be driven from the outer surface of the body to the parts immediately beneath.

Previous attacks of acute rhinitis, which have been but partially relieved, render the mucous membrane

of the nose peculiarly susceptible to fresh attacks. As a rule, the intervals between each succeeding paroxysm become briefer, until finally a more or less chronic form of the affection is engendered.

Pathology.—Impressions made on the peripheral nerves are carried through the sympathetic to the vaso-motors of the nasal membrane, producing a dilatation of its vessels.

Engorgement follows, through a slackening of the circulation, causing distention of the membrane and transudation of serum. Later on in the disease, the secretion becomes thicker, and of a mucous or muco-purulent nature, on account of the presence of broken-down cells, pus globules, etc.

Rhinoscopic Examination.—During the first twenty-four hours, or what is generally called the first stage of this affection, the mucous membrane covering the entire fossæ will be seen to be intensely congested and swollen and very dry, the secretory functions of the nasal glands being checked.

After the lapse of twenty-four hours, a thin, watery secretion makes its appearance upon the inflamed membrane, which gradually resolves itself into a copious discharge of mucous or muco-purulent matter.

Symptomatology.—An attack of acute coryza is generally ushered in by chilly sensations, speedily followed by slight febrile manifestations, such as anorexia, lassitude, increased cardiac action, etc.

Locally, the symptoms are well marked. In the

earlier stages, the swelling and dryness of the mucous membrane cause a marked fulness of the parts, with impairment to nasal respiration, together with disagreeable itching. These symptoms, together with frontal headache, occlusion of one or both nasal canals, and general muscular pains, render the diagnosis extremely easy. Later on, when the discharge is fully established, the sufferer presents the picture of distress. The eyes are reddened and suffused on account of the invasion of the lachrymal ducts and the interference with their proper function.

Deafness and pain in the ears, from the involvement of the Eustachian tubes, are quite frequently concomitant symptoms, and add to the sufferings of the patient.

Therapeutics.—In the first, or pre-exudative stage, acute coryza may frequently either be aborted, or the intensity and duration of the succeeding stages be mitigated, by the exhibition of the proper remedies.

The abortive plan of treatment is both local and systemic.

Local Treatment.—It is an undoubted fact that acute coryza in its earliest stage is a purely local affection, and that the secondary symptoms and manifestations in the system at large are chiefly due to the absorption of some specific poison from the nasal mucous membrane.

Whether this toxicum is the irritating emanations

which are the direct cause of many cases of acute coryza, or whether it is a new creation from pathological action, are points open to controversy.

Individually, I believe that both of these theories are, in a measure, correct. During the windy months, the atmosphere is filled with particles of noxious matter, which has lain dormant for a considerable period and become more or less organized under solar influence. Most of the cases of acute coryza so prevalent during this period of the year are undoubtedly due to the inhalation of these poisonous germs.

An excellent and most successful plan of treatment for the local abortion of this disease is the insufflation of undiluted boracic acid. The acid should be thoroughly applied anteriorly and posteriorly, and the applications repeated every three or four hours during the first stage.

Each application of this drug is immediately followed by a profuse discharge from the nasal membrane, due to glandular irritation.

In many instances a considerable amount of pain will be experienced by the patient immediately after the insufflation of boracic acid. The incorporation of morph. sulph. (gr. i. to ʒ ii.) with the acid will effectually counteract this symptom.

In the second or exudative stage, the chief indication for local treatment is the amelioration of local symptoms.

For the relief of the most disagreeable of all the local manifestations, the feeling of constriction from occlusion of the passages, we have an excellent remedy in hydrochlorate of cocaine.

A single spray application of the four-per-cent. solution of this drug is always followed by a marked decrease in the congestive swelling, and several consecutive treatments are generally sufficient to permanently remove this symptom.

In the third stage, when the acute symptoms have somewhat subsided, the applications of mild astringent solutions are indicated.

The mild vegetable astringents should be selected in these cases. Of this class of remedies tannic acid, either in the form of the officinal glycerole or as prepared below, is probably the best.

℞ Acid. tannic.....gr. xv.
Glycerinæ..... ʒ ii.
Aquæ..... ℥ i.

This preparation should be applied thoroughly both to the anterior and posterior cavities by means of cotton-wrapped probes in the manner described in the last chapter. As a preliminary to the application of astringents, great care must be taken to thoroughly cleanse the nasal fossæ with some form of antiseptic solution.

For this purpose no antiseptic is more generally useful than carbolic acid.

℞ Acidi carbolici.....gr. i.
Glycerinæ..... ʒ i.
Aquæ..... ℥ i.

The inhalation of steam impregnated with some one of the essential oils is exceedingly grateful in this stage of the affection. The most efficacious of these inhalations are:

℞ Ol. folii pini Sylvest..... ʒ ii.
Mag. carb..... ʒ i.
Aquæ..... ℥ iv.

℞ Tr. benzoin.co..... ℥ ii.

℞ Ol. carui..... ʒ ss.
Mag. carb.....gr. xxx.
Aquæ..... ℥ vi.

℞ Ol. cassia..... ʒ ss.
Mag. carb.....gr. xxx.
Aquæ..... ℥ vi.

In making use of these preparations as inhalants, a pint of boiling water is placed in the inhaler, and a teaspoonful of the solution immediately added thereto.

The inhalations can be used for from five to ten minutes, and repeated as often as they prove grateful to the patient.

General Treatment.—General abortive treatment consists in the early administration of quinine (gr. x.–xx.), accompanied by a brisk cathartic. The patient

must be ordered to a warm room and Dover's powder (gr. x.) administered, together with frequent hot drinks.

The *rationale* of this treatment seems to be the driving out of the system of the specific germs which would otherwise find a habitation therein and multiply.

In the subsequent stages, a continuance of the quinine in daily doses of gr. v. and a confinement at home for several days under proper hygienic conditions, will be all that is generally necessary.

CHAPTER VI.

CHRONIC CORYZA.

Definition.—A simple chronic inflammation of the mucous membrane lining of the nasal fossæ.

Etiology.—Chronic coryza is invariably the result of uncured acute or sub-acute inflammations of the nasal cavities.

When, from some cause or another, an attack of acute coryza is not followed by perfect resolution, the slight amount of inflammation that remains has a tendency to become persistent and resolve itself into a mild but chronic form of the disease.

In the majority of cases a succession of attacks of acute coryza will be necessary to the development of the chronic form, each paroxysm leaving the mucous membrane a little more inflamed than its predecessor.

Workers in factories where the atmosphere is impregnated with irritating dusts arising from the material used, or those subjected to the fumes arising from certain chemicals, are particularly liable to this disease.

Rhinoscopic Examination.—The mucous membrane is of a darker-red color than in acute coryza, is turgescent, and has a spongy consistency, especially in the neighborhood of the turbinated bones. This last pathological condition is easily demonstrated by exerting a slight amount of pressure with a flattened probe.

At times the above turgesence and swelling are more apparent than at others. The membrane will likewise be seen to be bathed with creamy mucus, which is but loosely attached. This condition is more noticeable in the vault of the pharynx, and forms a constant source of annoyance to the patient from the dropping of the mucus into the mouth.

Later on, as the disease progresses, the membrane becomes less turgid and less susceptible to the pressure of the probe, the swollen tissues becoming denser the nearer this affection approaches the hypertrophic form to be next described. The character of the discharge likewise becomes materially altered, and is seen to be much thicker and more tenacious, and of a muco-purulent nature.

Symptomatology.—Chronic coryza is an exceedingly annoying affection, particularly in damp and changeable weather, when all the existing symptoms are aggravated tenfold. Difficulty in breathing through the nose, more or less pronounced according to the degree of the turgescent swelling, is always a prominent symptom. Cough and expectoration,

superinduced by the constant trickling of the irritating secretions along the posterior wall of the pharynx, are likewise always present.

In those cases caused by irritating inhalations, particularly while under their baneful influence, intense itching, accompanied in a marked degree by paroxysms of sneezing, may be added to the above-mentioned symptoms. The voice is nearly always affected, the afflicted person speaking with what is popularly termed a nasal twang.

Vocalization is always seriously compromised, especially during the rendition of that portion of the register where the tone-waves traverse the nasal canals in their passage from the body. Frontal headache from the invasion of the sinuses, deafness, and pain in the ears from extension of the inflammatory action into the Eustachian tubes, are frequent concomitant symptoms.

Prognosis.—Ordinary cases of chronic rhinitis are particularly amenable to treatment, the affection speedily subsiding under proper therapeutical measures. If unattended, however, this disease will gradually resolve itself into the more persistent form of chronic catarrhal inflammation called hypertrophic, on account of organization taking place in the congested and swollen tissues.

Therapeutics.—The first step in the treatment of this affection should be the ascertaining of the cause, and its removal if possible. Those cases which are

due to irritating dusts in the workshop, or chemical emanations, must first be removed from their influence before any further attempt be made to effect a cure.

Chronic coryza, being essentially a local disease, no general treatment will be required, except that which is necessary to tone up the system in debilitated subjects.

Many writers have from time to time advocated the internal administration of cubeb preparations in catarrhal affections of the air passages, from a supposition that they exerted a specific influence upon the membranous lining.

I have thoroughly tried this drug in this class of diseases, and have never seen any beneficial results whatsoever.

Local Treatment.—A thorough cleansing of the cavities, both anterior and posterior, should precede all local medication.

An excellent combination for this purpose is the following:

℞ Acidi carbolici.....gr. iv.
Sodæ bicarb.....gr. xv.
Glycerinæ..... ℥ ss.
Aguæ..... ℥ iiiss.

After the membranes have been well cleansed, astringents and counterirritants are indicated to remove the inflamed condition, and bring about reso-

lution. The extract of pinus Canadensis, and the officinal glycerole of tannin are excellent applications in the earlier stages of this affection.

They should be applied on cotton-wrapped probes, and the operation repeated, at first, not oftener than once in forty-eight hours, in order that the membranes may not be unduly irritated.

Later on, however, when the congestion has been somewhat removed, the daily application of either of these drugs will prove beneficial.

As a stimulant and absorbent, cocaine possesses many advantages, and should always be tried.

After the congestive swelling has been somewhat removed, resolution can often be hastened by the insufflation of astringent powders.

The milder forms of vegetable astringents in the following preparations are to be preferred:

℞ Acidi tannici..... ʒ ss.
Pulv. acaciæ..... ℥ i.
Sacch. lac..... ʒ iii.

℞ Acidi Gallici..... ʒ i.
Sacch. lac..... ʒ iii.
Pulv. acaciæ..... ℥ i.

℞ Pulv. catechu..... ʒ ii.
Pulv. amyli.....ad ℥ i.

℞ Pulv. kino..... ʒ ii.
Pulv. amyli.....ad ℥ i.

℞ Pulv. krameriæ..... ʒ i.
Pulv. amyli.....ad ℥ i.

In the compounding of these prescriptions, care should be taken that the drugs be well triturated, in order that they may the more readily be absorbed.

Medicated bougies form quite an efficient remedy in the treatment of chronic coryza.

There is, however, one objection to their use, and that is the long-continued oozing of their ingredients. These bougies are constructed in several different sizes, with a view to their acting as dilators as well as astringents.

When employed as dilatants, the treatment should be inaugurated with bougies of the smallest calibre, and they should be introduced not oftener than once in twenty-four hours. When the smallest bougie is well borne, the next largest should be used, to be discarded in favor of the next size, as soon as it can be borne without creating pain from the distention of the parts.

The best forms of bougie in these cases are made of gelatine, to which is added some one of the vegetable astringents.

The efficacy of medicated bougie lies in the fact that the drugs which are incorporated in them are kept in direct contact with the membranes for a considerable period of time.

With reference to home treatment, the intelligent patient can do much to aid the endeavors of his physician. The affected parts should be cleansed as thoroughly as possible with some mild form of antiseptic

wash, both night and morning. For this purpose, a teaspoonful of bicarbonate of soda, dissolved in a pint of warm water, to which may be added four to six drops of carbolic acid, will make an efficient solution.

This preparation should be syringed through the nasal passages, and ejected through the mouth by means of the instrument described in Chapter IV.

In children, when syringing of the nose is impracticable, the cavities must be sprayed with the ordinary hand-ball atomizer.

The following application will answer in these cases:

℞ Acidi carbolici .....gr. i.
Sodæ bicarb.....gr. v.
Glycerinæ..... ℥ ii.
Aquæ.....ad ℥ ii.

After the nasal fossæ have been cleansed as thoroughly as possible, some one of the astringent powders tabulated above should be applied anteriorly, either by acts of snuffing or through the agency of an auto-insufflator.

The auto-application of medicated solutions by means of pledgets of cotton wrapped on probes, or by means of feathers, should always be discouraged.

The physician will seldom meet with patients skilful enough to make these applications properly; consequently there is always a liability of injury resulting from such treatment.

CHAPTER VII.

NASAL CATARRH.

Definition.—A chronic inflammation of the mucous membrane lining the nasal fossæ characterized by structural changes in the tissues involved.

Etiology.—Nasal catarrh in the majority of cases is the direct result of chronic rhinitis. The period of time necessary for a case of the latter affection to be transformed into the former disease will vary according to the severity of the rhinitic inflammation and to the susceptibility of the patient. The indiscriminate use of patented nostrums and appliances, and the application of strong solutions of the more powerful mineral astringents in the types of nasal inflammation previously considered, contribute largely to the causes of this affection.

Pathology.—In chronic coryza the thickening of the mucous membrane is due to infiltration, more especially in the epithelial layer.

When, however, this form of catarrhal inflammation has merged into the variety under consideration, organization has taken place in the thickened parts and connective tissue is formed throughout the

entire membrane involved. This transition is gradual, oftentimes taking several years for its completion, the new tissue finally becoming thoroughly organized and freely supplied with blood-vessels and nervous filaments. Hypertrophy of the mucous membrane in chronic catarrh may occur in any locality; it is more noticeable, however, throughout the entire extent of the free borders of the middle and inferior turbinated bones, both anterior and posterior.

Rhinoscopic Examination.—Anterior exploration will clearly reveal the hypertrophied membrane, especially over the inferior turbinated bones, where the tumefaction will oftentimes look not unlike a benign growth. Hypertrophy of the septal membrane will also be frequently found, its tissues being oftentimes seen to closely approximate the adjacent turbinated bone. Entire occlusion of the anterior nasal cavities is frequently met with in these cases.

Upon exerting pressure with the flattened probe the hypertrophied membranes can generally be pressed aside sufficiently to admit of some degree of exploration beyond. If the lumen be extended into the lower meatus, the hypertrophied membrane of the inferior turbinated bone will generally be found to encroach largely upon the lower canal, greatly narrowing its calibre and correspondingly compromising nasal respiration.

The middle turbinated bone will be seen to be in

much the same condition as the inferior spongy body, the membrane covering its free edge being greatly enlarged and encroaching upon the septum.

The color of the membrane in nasal catarrh is generally dusky red; during, however, the exacerbations which frequently occur, the inflamed tissues present a much brighter hue.

Minute ulcerations of the membrane are frequently seen, particularly where the hypertrophied tissues impinge upon one another.

Slight excoriations or abrasions are frequently noticeable in the neighborhood of the alæ. They are due to the frequent blowing of the organ and to the irritable nature of the discharges.

The membranes throughout the entire fossæ are covered with a thick and tenacious mucus of a yellowish or grayish-yellow color, and a thorough cleansing of the parts is frequently required before an examination is feasible.

Posterior rhinoscopy will reveal quite an instructive and interesting picture. In the central portion of the field will be seen the septum standing out prominently with its sides bulging, as it were, from the hypertrophic condition, and presenting a somewhat whitish color.

On the extreme right and left of the picture the prominences of the turbinated bones swollen and congested will be plainly outlined. The hypertrophied membrane covering these bodies will be

frequently seen to hang down in folds, which may be mistaken for polypoid growths. The color of the diseased membrane located in the posterior nasal cavities is of a whitish aspect, probably due to some interference with the vascular supply.

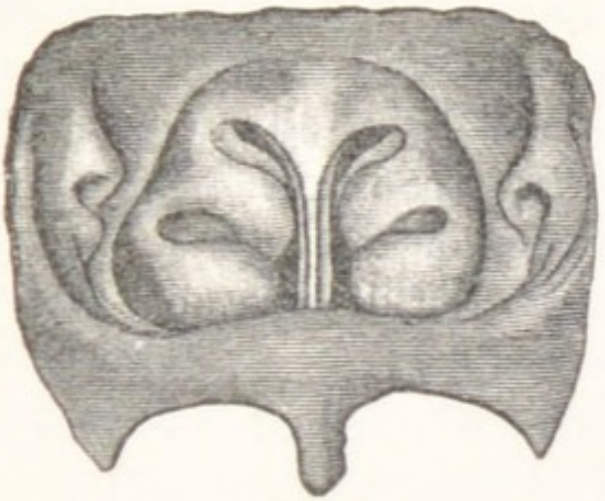

FIG. 19.
POSTERIOR HYPERTROPHY (Lefferts).

The prominences of the Eustachian tubes are much more marked and present a much higher color than in health, and the orifices of the canals are considerably narrowed. The posterior openings of the meatuses will be seen to be much smaller than in the normal subject, so likewise the opening of the posterior nares, particularly in those cases characterized by membranous enlargement over the posterior margin of the septum.

Symptomatology.—The most prominent and at the same time most annoying symptom is the presence in the nasal cavities of the characteristic discharges, the patient being constantly compelled to hawk and expectorate in his efforts to dislodge and discharge the adherent mucus.

The annoyance is more apparent in the morning, especially after eating, the accumulations of the entire night then becoming dislodged by deglutition

and the warmth imparted to the tissues by the food partaken of.

The secretions too frequently become impacted upon the superior surface of the velum, producing a sensation as if some foreign body were located there and resisting all efforts at dislodgment.

The constant dripping of the mucus from the posterior nasal cavity into the mouth is a prominent and most disagreeable feature of most cases of nasal catarrh.

This symptom is most marked in cases where the hypertrophied condition of the turbinated membranes is greatest, which seems to show not only the source of the supply, but also that the cause of the dripping is due to a blocking of the passages.

The next most important symptom is the interference with the respiratory functions of the nose, entailed by the hypertrophic swelling of its lining membranes.

When the stenosis is complete the sufferings of the patient are marked; but happily these extreme cases are rarely met with, a partial occlusion being the condition generally encountered. The degree of occlusion in an individual case is apt to be more pronounced at times, and there is a frequent shifting of this symptom from one side to the other.

This is due to the extreme sensitiveness and irritability of the membranes and their susceptibility to atmospheric influence.

The breath in most cases is extremely odorous, its offensiveness being particularly noticeable in large gatherings indoors. The sense of smell is always more or less compromised, especially when the pathological features are marked in the olfactory region.

Hearing is likewise apt to be impaired. This symptom may be due to either one of two causes: the narrowing of the mouths of the Eustachian tubes by hypertrophied membranes, or from an extension of the catarrhal inflammation into the canals themselves.

The voice, both in speaking and singing, is always impaired in well-marked instances of this affection, and is due to an interference with the physiological action of the fossæ. In these cases the voice is raspy and muffled and has imparted to it that peculiar sound to which the name of "twang" has been applied.

Conjunctival irritation, with reddening and increased lachrymation, are prominent concomitant symptoms. Frontal headache is oftentimes a marked symptom. It is referable to the frontal prominences and is due to the involvement of the mucous membrane lining the sinuses.

Prognosis.—Under the proper surgical and medical treatment the prognosis of uncomplicated nasal catarrh is extremely good.

In unskilful hands, however, this disease is pro-

gressive and will undoubtedly eventuate into a more serious form of catarrhal inflammation. During this transition the intensity of many of the above symptoms will be increased; deafness will be more apparent; the sense of smell almost if not entirely lost; and the paroxysms of frontal headache more frequent and more pronounced. Catarrhal affections of the pharynx and larynx will also supervene, and the sufferings of the patient thereby greatly enhanced.

Therapeutics.—The treatment of this affection is the most important subject to be considered in the entire field of nasal literature.

In the earlier stages of nasal catarrh, before the new connective tissue comprising the hypertrophied membranes has become fully organized, absorption can generally be produced by the exhibition of some of the alterative astringents.

The question now arises, can a differential diagnosis be made between the earlier stages and those in which the hypertrophied membrane becomes fully and permanently organized? I think it can, and by quite a simple test—namely, the pressure of the nasal exploring probe upon the affected tissues.

If the flattened probe be introduced into the anterior nasal cavity and pressure be exerted upon the hypertrophied tissues, and the membrane be somewhat tense, returning to its original position quickly upon removing the probe, the new connec-

tive tissue is still undergoing organization, and there is every probability that the diseased parts can be restored to their normal condition. If, however, under the pressure of the probe, the tumefaction be in a soft and flabby condition, and, when the pressure of the instrument is removed, the tissues resume their previous condition in a sluggish manner, the new formations may then be said to be fully organized, and astringent applications will have a negative effect.

Another diagnostic feature of the true hypertrophy is that the affected membranes present an undulated appearance, while prior to complete organization their surface is smooth and uniform.

In the treatment of the earlier stages as above differentiated, the astringent applications should be preceded by the use of any of the following antiseptic cleansing sprays :

℞ Acidi carbolici.....gr. ii.
Glycerinæ ..... ʒ i.
Aquæ.....ad ℥ ii.

℞ Acidi carbolici.....gr. ii.
Sodæ bicarb.....gr. viii.
Glycerinæ..... ʒ i.
Aquæ.....ad ℥ ii.

℞ Acidi salicylici.....gr. ii.
Sodæ bicarb.....gr. viii.
Glycerinæ..... ʒ i.
Aquæ.....ad ℥ ii.

In cleansing the nasal cavities, the compressed-air spray apparatus (see Chap. IV.) should be employed

wherever possible, and a pressure of from twenty-five to thirty pounds used. The mucous secretions in this affection are of such a thickened and tenacious character that the few pounds of pressure possible to be generated in the rubber hand-ball apparatus is totally inadequate to dislodge it.

The ordinary piston, hard-rubber syringes are likewise not only inefficient in their action, but are exceedingly clumsy even in the most skilled hands. This is particularly true with reference to the long, curved instrument designed to penetrate into the posterior nasal cavity.

The introduction of this latter form of nasal syringe is always a difficult matter on account of the natural sensitiveness of the parts, and its manipulation, the patient being required to bend his head downwards and receive the escaping fluids in a hand basin, is decidedly disagreeable to both parties concerned. In some cases, when the secretions are very ropy and tenacious, the most forcible spraying will not accomplish the dislodgment. In these cases recourse must be had to the straight or curved forceps, according to the location of the discharges, or, what is better, the adherent mucus can be removed with the cotton pledget wound around the end of a straight or curved probe. After the membranes have been thoroughly cleansed the application of medicaments, combining both astringent and absorbent properties, is in order.

Iodine and iodide of zinc in the following solutions are the best of this class of remedies.

℞ Iodine.....gr. ii.
Potass. iodidi.....gr. iv.
Glycerinæ,
Aquæ.....āā ℥ i.

℞ Zinci iodidi.....gr. v.
Glycerinæ,
Aquæ.....āā ℥ i.

Either of the above solutions, to produce the desired effect, must be applied thoroughly to all the nasal cavities by means of absorbent cotton, as set forth in Chapter IV.

With reference to the frequency of treatments, applications should be made at least once a day for from two to three weeks, when an interval of from twenty-four to forty-eight hours, gauged according to the improvement noted, should be allowed to elapse between the visits. In the generality of cases —that is, if they be proper ones for this plan of treatment—a cure can be expected in from three to four months.

Insufflation of medicated powders is also an efficacious plan of treatment in these earlier stages.

The mineral astringents are the more desirable in these cases.

℞ Zinci chloridi.....gr. v.
Sacch. lac.....℥ ss.
Pulv. acaciæ.....℥ ss.

℞ Ferri et alum. sulph .....gr. x.
Sacch. lac..... ℥ ss.
Pulv. acaciæ..... ℥ ss.

℞ Potass. permanganat.....gr. x.
Pulv. amyli ..... ℥ i.

℞ Zinci iodidi.....gr. v.
Pulv. amyli ..... ℥ i.

The daily cleansing of the nasal cavities by the patient himself, followed by the insufflation or snuffing of the vegetable astringent powders, especially tannic acid and gallic acid (gr. v.–x. pulv. acaciæ ʒ i.), will do much to hasten resolution.

The degree of success attainable in the treatment of these cases will greatly depend upon the patency of the nasal canals. In cases where the hypertrophied membrane is sufficiently enlarged to prevent proper treatment of the cavities beyond, or from any other causes occlusion occurs, the obstructions must be removed by surgical interference before medication is attempted. For the removal of redundant nasal tissue three plans of treatment present themselves to the consideration of the surgeon: the application of acid solutions, destruction with the galvano-cautery, and removal with the nasal snare.

Of the several different acids advocated for the performance of this operation, two only should ever be introduced into the nasal fissure, namely: glacial-acetic, and monochlor-acetic, a preference being given to the latter drug. The stronger acids, such as

nitric, sulphuric, or chromic, should never be employed in these cases, not only on account of their extremely harsh action, but also from the danger of exciting persistent ulceration.

In applying acids to the nose, a thin pledget of cotton should be twisted around the flattened extremity of the nasal probe and, after being lightly dipped in the solution, should be thoroughly passed over the tissues to be burned.

If the membrane has been previously treated with a four-per-cent. solution of cocaine, the pain consequent to the application will be greatly diminished.

In making the cocaine application in these cases, the cotton pledget should be thoroughly saturated, and when introduced into the nose held for a considerable time against the membrane to be touched.

I have found much less pain from the acids when the cocaine has been applied in this manner than when the parts have been sprayed with the anæsthetic. The number of acid applications required to remove an exuberant membrane will depend upon the extent of the hypertrophy ; generally speaking, from three to five, at intervals of a week or ten days, will suffice.

The most disagreeable feature about making acid applications to the nasal organs is the decidedly uncomfortable and annoying symptoms which are always experienced for several days after the operation. The nasal cavities are completely blocked up,

there is a sense of constriction and marked pain referable to the bridge of the nose, frontal headache is pronounced, and a continual discharge of a thin and decidedly acrid secretion. In fact, all the symptoms of an aggravated attack of acute coryza are present.

I have been rarely able to obtain the consent of my patients to more than one or two of these applications, and therefore of late have discarded this plan of treatment in favor of a quicker method.

Destruction with the galvano-cautery is by far the most efficacious and agreeable method of removing hypertrophied mucous membrane.

Its action is not only instantaneous, but the pain consequent to the cauterization is scarcely noticeable when the parts have been previously saturated with cocaine.

With regard to the after-effects, the long chain of symptoms which follow the acid applications are entirely wanting, there being but a slight amount of local inflammation created by the heated wire.

Most writers recommend a special form of speculum for the protection of the tissues opposite to those which it is intended to burn; but if the nasal dilator described in Chapter III. be used, and the galvano-cautery be properly applied, no further instrument will be necessary.

The galvano-cautery apparatus consists of the battery, the universal handle, and the platinum-

tipped electrodes. An ordinary two- or three-cell plunge battery, charged with the caustic solution (potass. bichrom. ℥ iiiss., acidi sulphurici lb. i., aquæ Oii.), or some form of storage apparatus can be used. Unless located in towns where storage batteries can be recharged, the former instrument is to be preferred. The recharging of storage batteries can of course be accomplished by the physician, but the number of primary cells necessary, and the attention which they constantly demand, render their use impracticable to the busy practitioner.

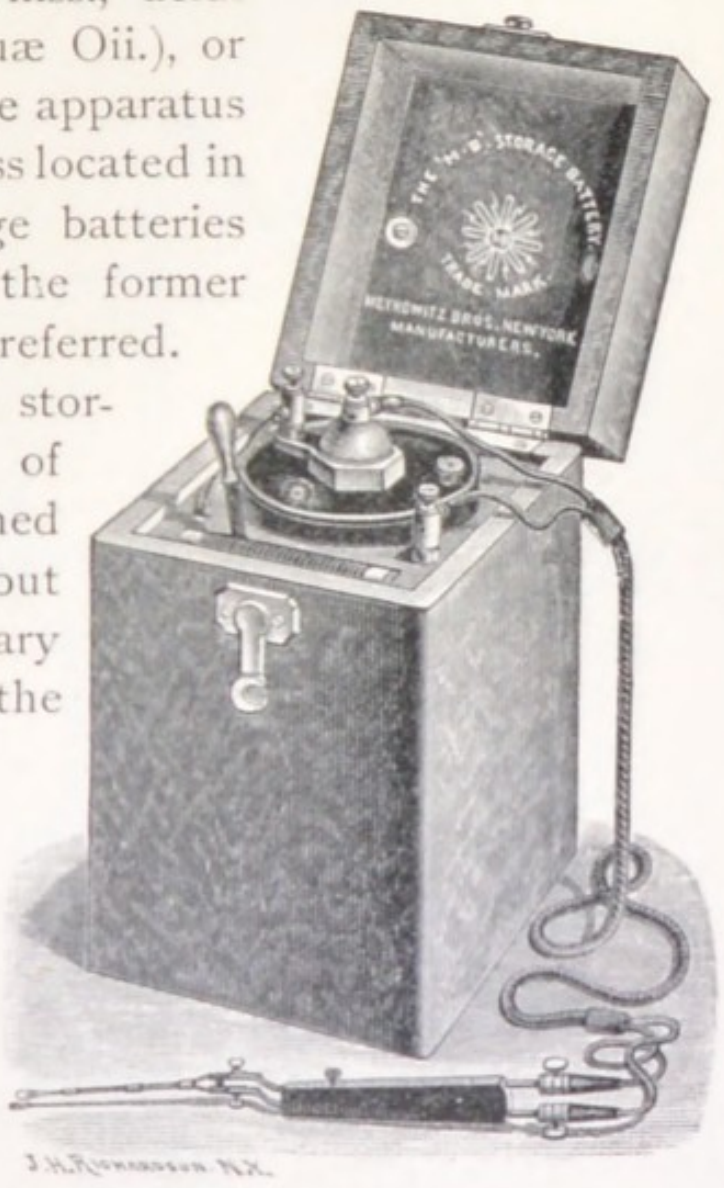

FIG. 20.

STORAGE BATTERY.

An excellent form of cautery battery is illustrated in Fig. 21. This is not only a thoroughly reliable instrument, but also an inexpensive one. It can likewise be used to run the electric laryngoscope or a small motor.

The cautery handle consists of a hard-rubber tube, provided with a little spring button on the upper surface, by the pressing of which the circuit is completed.

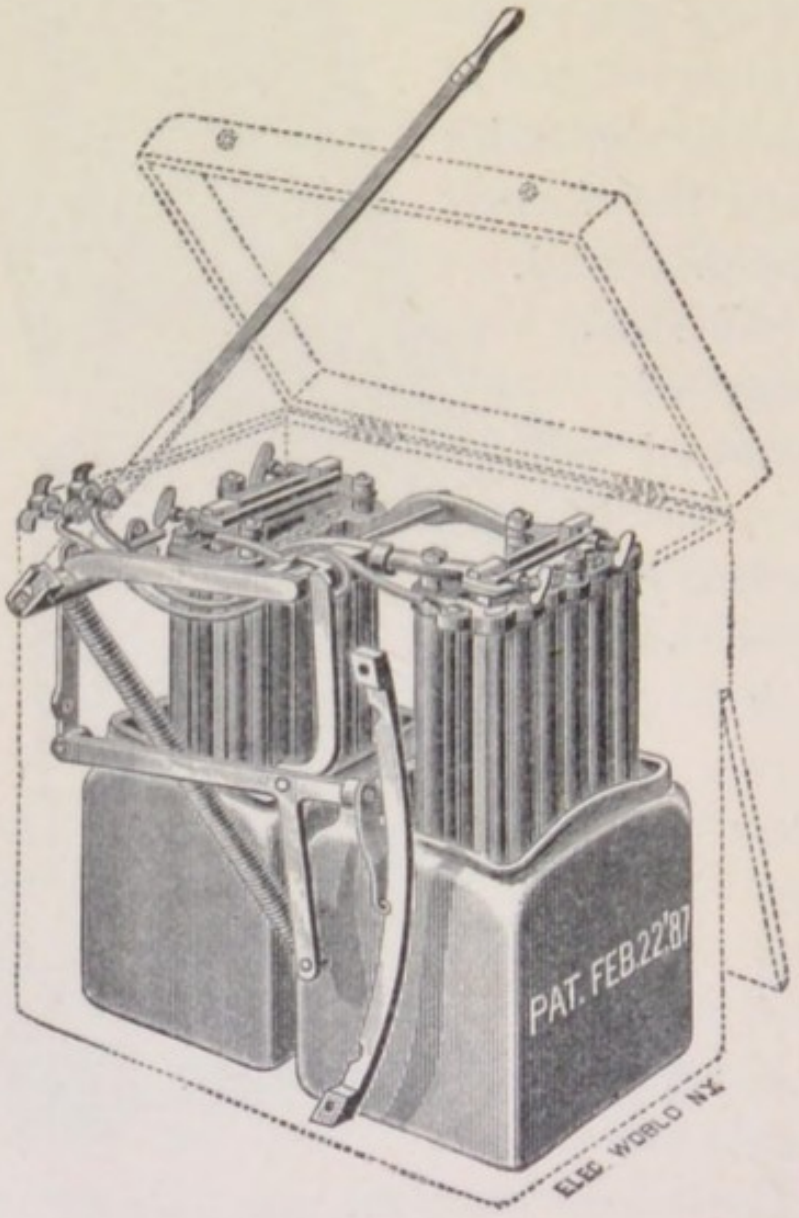

FIG. 21.
GALVANO-CAUTERY BATTERY.

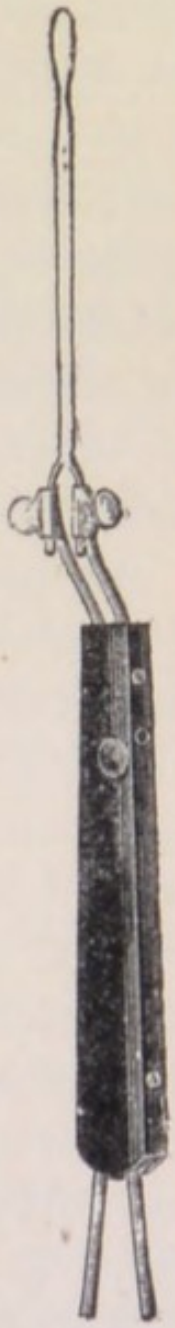

FIG. 22.
UNIVERSAL GALVANO-CAUTERY HANDLE.

There are a great variety of nasal electrodes, many of which were devised to meet the indications of in-

dividual cases. For general use the forms depicted below will answer all practical purposes. In properly applying the galvano-cautery several steps must be carefully taken.

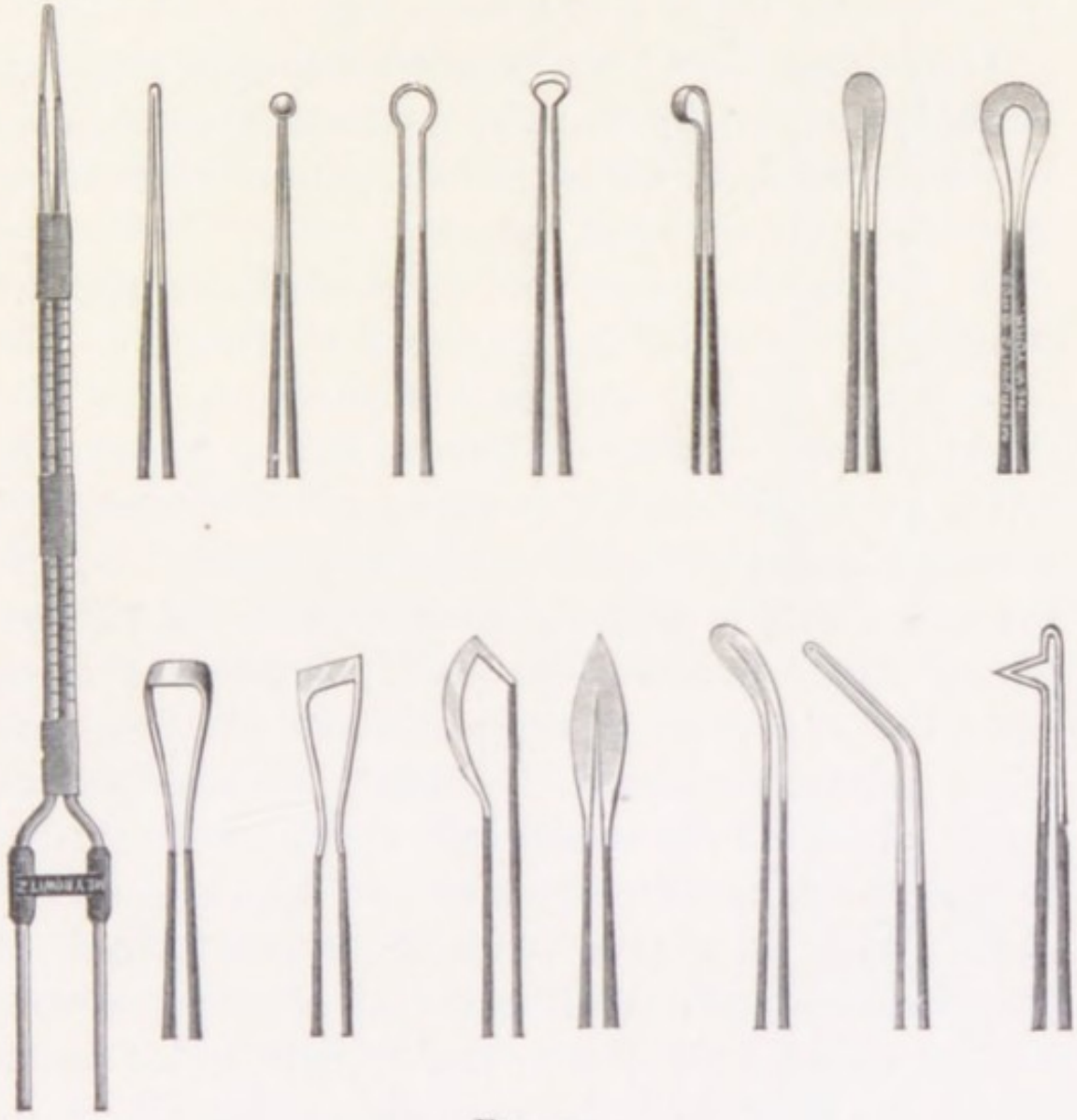

FIG. 23.
NASAL ELECTRODES.

First, the head of the patient must be thrown well back and the nostrils well dilated.

Second, the electrode must be introduced cold, and

its platinum tip pressed well against the tissues to be cauterized.

Third, the push button in the handle must be pressed for a few seconds only, and then released, the electrode being withdrawn cold.

The introduction of the wire when heated, although strongly advised by some specialists, should always be discouraged, on account of the danger of touching other than the required tissues.

If the battery fluid be in good condition, the transition of the platinum from a cold state to that of a white heat is almost instantaneous, and the slight increase of pain occasioned during the change is far overbalanced by the danger of injuring the tissues during the transit of the instrument. When the instrument is properly handled, and the battery is sufficiently powerful to quickly produce a white heat, the operation is comparatively painless, provided cocaine be previously applied, and the patient rarely objects to a repetition of the cauterization. In many instances from one to two applications will suffice, while in others, when the hypertrophy is of long standing and extensive, several more treatments will be called for. When the hypertrophied membranes are large and flabby, hanging down in folds or ridges, cauterization will frequently be insufficient to remove them thoroughly. The most efficient method of removing these tumefactions is by means of the nasal snare. Great credit should be accorded

to Dr. Jarvis, with whom the idea originated of encircling tumors with wire and gradually severing their connection with the body by means of a tightening of the loop.

The mechanical action of Jarvis' snare is very simple. The instrument is armed by threading with very fine piano wire, allowing a sufficiently large loop to be exposed to admit of introduction into the nares. When the vicinity of the tumor is reached, the loop is enlarged and the mass engaged. The operation is completed by revolving the screw-nut, which gradually narrows the loop and cuts through the constricted tissues. In the removal of redundant tissue with the nasal snare, the operation should be performed slowly, in order that hemorrhage, which is always marked in the removal of exuberant membrane, be as light as possible.

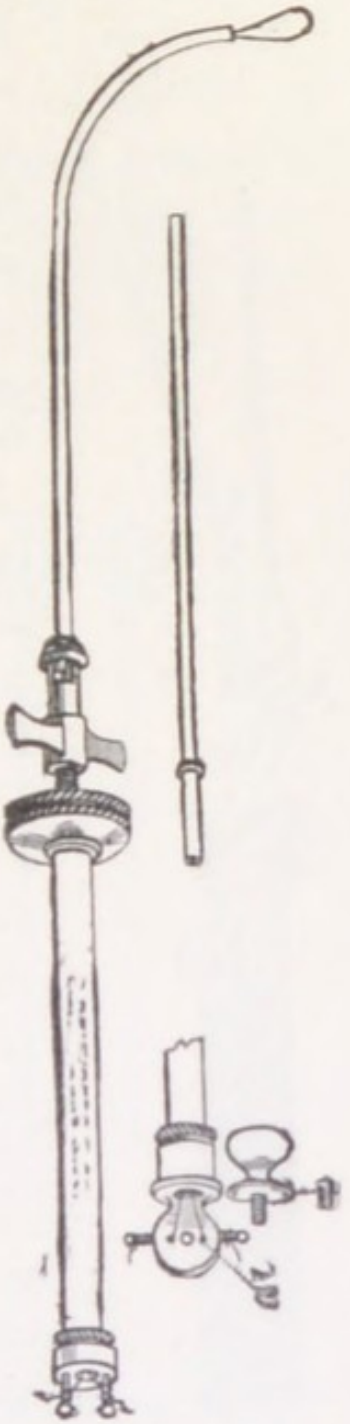

FIG. 24.
JARVIS' SNARE.

For the removal of hypertrophied tissue the galvano-cautery snare possesses decided advantages over the cold wire.

With this instrument the operation can not only be rapidly performed, but there is also a minimum amount of bleeding, the heated wire producing coagulation of the escaping blood. The only difference between the manipulation of the galvano-cautery snare and the cold-wire instrument is that, when the mass is properly engaged, the platinum wire of the former instrument is brought to a white heat at the instant the constricting process is inaugurated, and the operation is much more rapidly performed. When the hypertrophied membrane is located so far back that it cannot be engaged by the aid of anterior rhinoscopy, the operator must guide the wire by means of the small mouth mirror properly placed in the palato-pharyngeal space. In these cases the surgeon will be greatly aided by tying back the soft palate with pieces of tape passed through both nostrils and tightly fastened over the lip or around the ears.

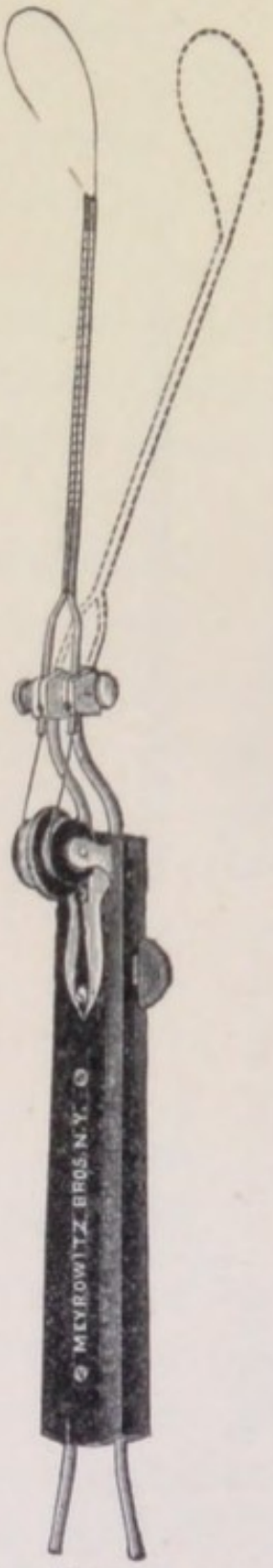

FIG. 25.
UNIVERSAL CAUTERY SNARE.

The snaring of tumors, when located in the posterior cavity, is oftentimes a difficult and tedious matter,

and necessitates the exhibition of a great amount of patience.

A plan of operation which will frequently be successful is to introduce the snare well back into the posterior nasal cavity, enlarge the loop somewhat, and then revolve the instrument about halfway.

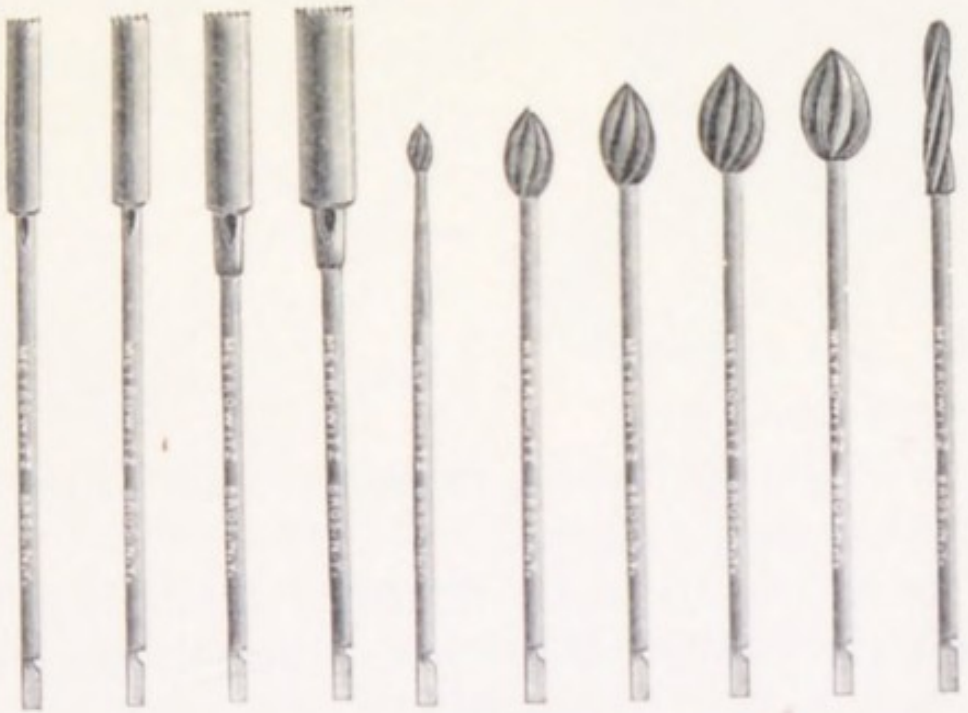

FIG. 26.

NASAL BURRS.

In a certain percentage of cases of nasal catarrh, especially when the disease is of long standing, the turbinated bones themselves become involved in the inflammatory processes, and permanent thickening of the perichondrium superinduced. For the

removal of these bony hypertrophies two methods of operation present themselves to the consideration of the surgeon: the enlargement of the canals by drilling, or the amputation of the enlarged portions of bone.

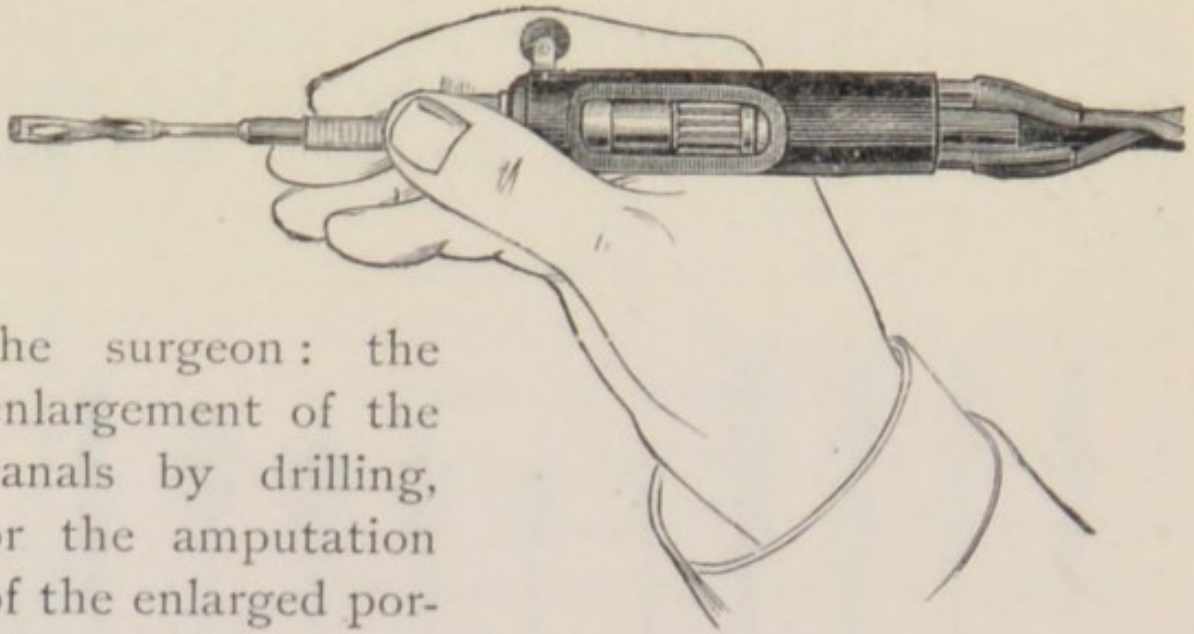

FIG. 27.
MANNER OF HOLDING BURR.

The first method is performed by means of an instrument familiar to all, called the surgical or dental engine.

A burr, selected with reference to the size and conformity of the cavity to be drilled, is fitted into the shank of the instrument and introduced into the narrowed orifice; the pedal of the engine is then worked very quickly, which produces a rapid revolution of the burr, causing a shaving off of the exuberant bone tissue with great nicety.

In the performance of this operation the head of the patient is thrown well back and the nostrils fully dilated by the three-pronged self-retaining speculum.

The burr should be held firmly between the thumb and forefinger, and when *in situ* pressed tightly against the tissues to be removed.

The only point worthy of special mention is that the operation should be performed rapidly, on account of the free bleeding which is always excited.

There has lately been devised a form of drilling apparatus in which electricity as a motor power has been made use of. The electric motor presents two decided advantages over the dental engine: great rapidity of action, insuring a speedy operation; and no assistant is required, the awkward pedal movement being done away with.

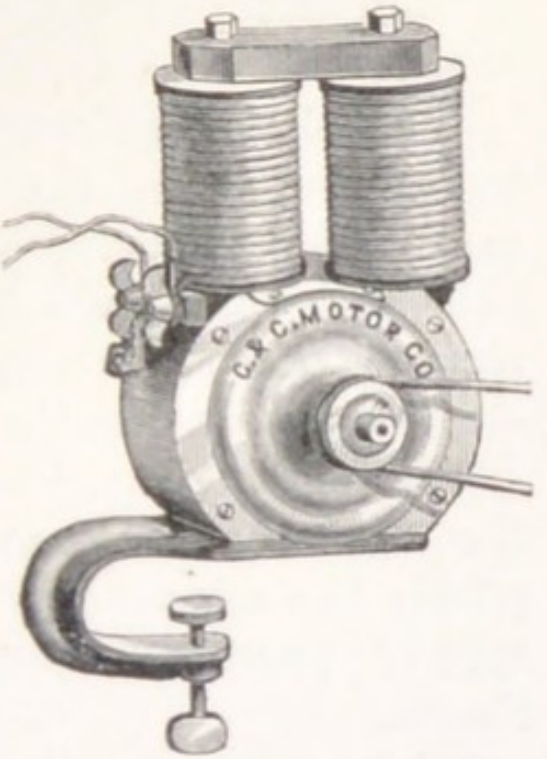

FIG. 28.
THE ELECTRIC MOTOR.

The amputation of hypertrophied bone tissue in the nasal fossæ is accomplished by means of the nasal saw.

The form of nasal saw illustrated on p. 80 consists of two parts, the saw and the handle. The saw portion is affixed to the handle by means of a small thumb-screw, by which it can be set in any position desired.

This is a great desideratum, as operations upon different portions of the cavities require the holding of the saw in different angles.

When it is required to saw upwards, the saw portion can be revolved one-half way, which will bring the teeth on the upper edge, thus making one instrument take the place of two.

The toothed edge is much finer than the ordinary instrument, which will enable the operator to obtain a more speedy purchase upon the osseous tissues.

With reference to the merits of these two operations, each has its own special adaptability.

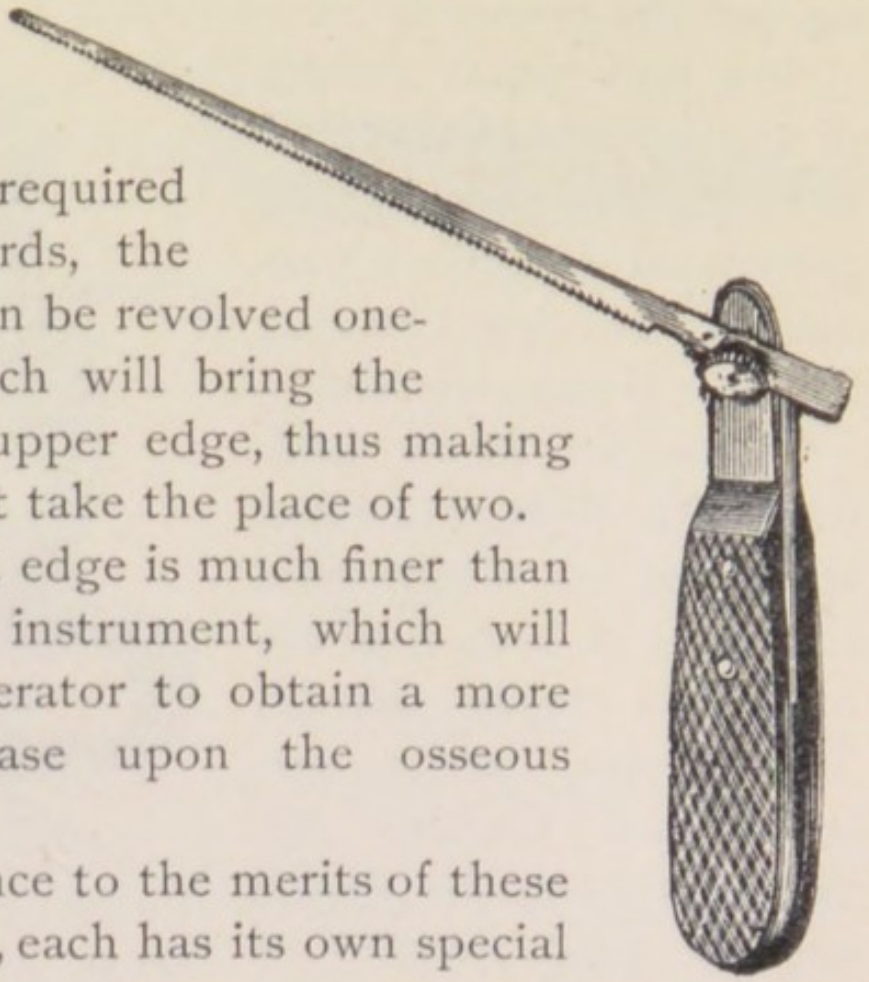

FIG. 29.
AUTHOR'S NASAL SAW.

When the osseous tissue to be removed is located deep in the canal, and at the base of the inferior turbinated bone rather than on its free border, the nasal drill will be especially applicable to the widening of the nasal canals. When, however, the pathological condition is located in the anterior portion of the fossæ, especially in the free borders of the turbinated bones, sawing will be the better operation.

With reference to both of these operations, they

should be performed as speedily as possible, on account of the hemorrhages which always accompany them and which quickly obscure the passages.

The free exhibition of cocaine in these cases will not only serve as an anæsthetic, but will also act as a hemostatic on account of its peculiar contractile action upon the blood-vessels.

CHAPTER VIII.

ATROPHIC CATARRH.

Definition.—A chronic inflammation of the nasal fossæ, characterized by pathological changes chiefly in the glandular structures of the mucous membrane.

Etiology.—As chronic rhinitis, after the lapse of a varying period of time, merges into nasal catarrh, so will the latter affection, having the same progressive tendency, be liable to develop into the atrophic form of inflammation.

Persons leading a sedentary life, or those confined to illy ventilated apartments, especially artisans, such as tobacco-workers, carpenters, etc., who toil in an abnormally dry atmosphere, are peculiarly prone to this disease.

Males are more frequently attacked than females, the reason for this peculiarity being the use of tobacco, the smoke of which is an especial excitant of atrophic catarrh.

Pathology.—The peculiar characteristic feature of this affection is the dryness of the nasal mucous membrane.

This is due to some interference with the secretory functions of the glands and follicles which are so abundant in this locality.

Many pathologists believe that the diminution of the nasal secretion is due to pressure exerted upon the glands by the new tissues developed in the course of hypertrophic catarrh, and which causes their destruction. Another class hold that the pathological condition is produced by diseased action within the glands themselves, whereby these organs become atrophied and, consequently, inoperative. When we take into consideration the etiology and diagnostic features of the affection, the latter theory seems to be the more plausible of the two.

The atrophy, however, is not confined to the glands and follicles, but in well marked cases the entire mucous membrane presents the same pathological condition, the retraction being chiefly noticeable in the vicinity of the turbinated bones.

Rhinoscopy.—Upon examination the entire membrane will present a dry and shrivelled aspect. This condition is especially marked on the posterior wall of the pharynx, the tissues in this locality oftentimes looking like parchment.

The congested and hypertrophied conditions, so marked in nasal catarrh are here wanting, the tissues being less highly colored and retracted to such a degree that free examination beyond is permissible.

The cavities, both anterior and posterior, are lined

with thin crusts of inspissated mucus of an extremely dirty color and difficult of dislodgment. When these crusts have been removed the membrane will be seen to be of a darkish-red color in some localities, while in others its appearance will be nearly normal. Where the scabs have been most adherent, little points of ulceration will invariably be found.

Symptomatology.—The excessive dryness of the parts together with the presence of the crusts of inspissated mucus give rise to the most prominent symptoms of this affection. The dryness of the tissues leaves the delicate nasal membranes free to the action of all irritating substances that may be inhaled. Irritability is such a prominent feature in many cases of atrophic catarrh, that even a breath of cold air will oftentimes be productive of uncomfortable sensations. The constant presence of the scaly and tenacious secretions and the unremitting endeavors of the patient to dislodge and discharge them, produces a dry and rasping cough. Fetid breath is most marked in these cases, the offensive odor quite frequently causing the sufferer to abstain from all social gatherings. Epistaxis from the degeneration of the mucous membrane is also a frequent symptom in some cases.

The total loss of the sense of smell or a serious impairment of this function, together with more or less deafness, are likewise concomitant symptoms. As the mucous membranes lining the frontal sinuses

are generally in a greater or less degree involved in the inflammatory action, frontal headache is apt to be present,

Prognosis.—A well-developed case of atrophic catarrh is a most troublesome affection and less amenable to treatment than any other of the inflammatory diseases of the nasal organs. This is chiefly due to the loss of vitality in the parts, and to the destruction of the epithelial and glandular structures of the membranous lining.

On account of the improved methods now at hand of relieving by surgical interference the less aggravating forms of catarrhal inflammation, and from the fact that the laity are just beginning to find out that nasal catarrh can be cured when skilfully treated, examples of this disease are less frequently met with than hitherto.

Therapeutics.—The indications for treatment are threefold : the thorough cleansing of the cavities of the scaly and inspissated mucus, the healing of the ulcerations found underneath the adherent scabs, and the restoration of the vitality to the diseased membrane. The cleansing of the canals is a most difficult matter, the mucus being so adhesive and the crusts so firmly attached to the subjacent tissues, that the most forcible sprays will generally fail to clear the cavities. To remove the attached scabs it will frequently be necessary to first loosen them by a gentle uplifting with the nasal probe.

The thick and ropy mucus can be best extracted by means of the cotton pledget introduced on a probe or wire.

The persistent syringing of the organs at least twice a day by the patient himself with the nasal injection syringe (Fig. 18) will greatly assist the endeavors of the physician in this direction.

As a nasal cleanser a strong antiseptic solution, which will also be useful to counteract the offensive odor will be called for. Permanganate of potash, either in a simple aqueous solution or in combination with bicarbonate of soda, is an excellent antiseptic for the above purposes.

℞ Potassii permanganat.....gr. xx.
Aquæ.....℥ iv.

℞ Potassii permanganat.....gr. xx.
Sodæ bicarb.....gr. x.
Aquæ.....℥ iv.

When employed by the patient, the above medicaments can be prescribed in the form of powders (Potass. permang., gr. v.; sodæ bicarb., gr. xx.). A powder containing the above quantity should be dissolved in a pint of lukewarm water and syringed through the nares at least twice a day.

When the cavities are freed from the encrusted mucus, the ulcerative points must be freely touched with some form of caustic application. Argenti ni-

tras fused on the end of a silver or aluminum wire, by heating the rod and pressing it against the caustic, is by all odds the best and safest drug for this purpose. Several applications of the argentum will generally be necessary to heal these nasal ulcers. The use of the galvano-cautery, although the results are much quicker, is not to be advised on account of the low vitality of the membrane and the tardiness of resolution. After the ulcerations have been removed, some form of local medication must be pursued with a view to the restoration of the vitality of the tissues, Carbolic acid is an excellent remedy for this purpose.

℞ Acidi carbolici.....gr. xv.
Glycerinæ.....ʒ ii.
Aquæ.....ad. ℥ i.

℞ Acidi carbolici.....gr. x.
Glycerinæ.....ʒ ii.
Aquæ.....ad. ℥ i.

In inaugurating the treatment, the stronger of the above solutions must be applied thoroughly to the cavities at least once a day by means of cotton pledgets, the parts having been previously thoroughly cleansed. After this plan of treatment has been rigidly adhered to for from six weeks to two months, the milder solution of the acid can be employed and intervals of forty-eight hours allowed to elapse between the applications.

Care must be taken to impress upon the patient the fact that several months must elapse before any marked improvement can be expected, as catarrhal patients are generally easily discouraged on account of many previous disappointments.

The use of tobacco in this, as well as milder examples of catarrh, should be interdicted, and treatment absolutely refused unless the patient agrees to a total abstinence.

CHAPTER IX.

SYPHILITIC RHINITIS.

Definition.—An inflammation of the nasal mucous membrane superinduced by the special toxicum of syphilis.

Etiology.—In this locality, syphilis may present itself in either the primary, secondary, or tertiary form. Instances of the first degree must be from direct contagion, and are extremely infrequent. Secondary manifestations appear in from six to twelve months, and are but casually encountered. Tertiary syphilis forms the vast majority of special symptoms in this affection, and may appear at any time from three to twenty years after the primary inoculation.

It is a well accepted theory that hereditary influence plays an important part as a causative agent in syphilitic rhinitis, and many pathologists have gone so far as to class the majority of those cases to which the appellations scrofulous rhinitis, ozæna, strumous catarrh, etc., have been given, with the milder forms of hereditary syphilitic inflammation of

the nose so frequently met with. I incline to the beliefs of these gentlemen and for a long time have accompanied local treatment, in many so-called scrofulous and strumous cases, with the internal exhibition of anti-syphilitic remedies. The results of this plan of treatment have been very gratifying and have enabled me to properly place many doubtful cases.

The above theory does not apply of course to those forms of rhinitic inflammation which are the direct sequelæ of exhaustive diseases, and to which the name of strumous catarrh properly belongs.

Pathology.—The pathological lesions occurring in connection with syphilis of the nose are chiefly due to the breaking down of the tissues and the formation of well-defined ulcers.

These ulcers have been divided into two distinct classes; the superficial and the deep. The preponderance of opinions places the etiology of superficial ulcers in the nasal organs with secondary syphilis, the deep ones being a peculiar manifestation of the tertiary type.

The superficial ulcer generally begins as a simple hyperæmia, to be speedily followed by slight elevations in the membranes, the surfaces of which become soon denuded of their epithelium, presenting an eroded appearance. The denuded elevations gradually spread, and the process of destruction continues until generally quite a large patch of

membrane is involved, and a well-defined ulceration, surrounded by a brighter areola, is created.

The tertiary or deep ulcer is produced by an infiltration of gummata into the deeper layers of the mucous membrane, and which gradually becomes softened and breaks down.

The first manifestation to the eye is an irregular hypertrophy of the affected tissues, which is speedily followed by the breaking down of the parts and the rapid formation of excavations. If the ulcerative process be not arrested, and if the toxicum be sufficiently powerful, the bony tissues immediately underlying the ulcerations will be involved in the destruction, and necrosis supervene.

Rhinoscopic Examination.—In secondary syphilitic rhinitis, until the appearance of the ulceration, the picture presented to the observer is identical with that furnished by an ordinary case of subacute coryza. The membranes are slightly swollen and congested, with an absence of secretion in the first stage, to be followed in about twenty-four hours with a more or less copious muco-purulent discharge. The syphilitic inflammation at this period presents no local differential diagnostic features. Later on, however, when the ulcerative process has become established, the peculiar and well-defined darkish-gray patches indicate the nature of the affection, and the diagnosis can generally be confirmed by putting the necessary queries to the patient.

The secondary ulcer is surrounded by an irregular line of demarkation slightly elevated and of a lightish-red hue. The surface of the ulcer is covered with a thick greenish-yellow secretion, which requires considerable spraying to remove.

In tertiary syphilis of the nose, the premonitory symptoms are almost identical with those presented in an ordinary well-marked case of nasal catarrh. The only diagnostic points, other than a history of the case, that will suggest the former affection, are the rapid development of the peculiar hypertrophied condition, and the dusky-red hue imparted to the membrane.

When, however, the peculiar and characteristic ulcers make their appearance, the diagnosis is extremely easy. The ulcerative processes commencing in the deeper structures of the membrane, a few hours will sometimes suffice to develop a well-marked ulcer in the nasal fossæ. When viewed with the rhinoscope, the syphilitic ulcer is a deep excavation surrounded by a highly inflamed areola of markedly ragged edges.

It is covered with thick and tenacious greenish-colored muco-pus of a greater or less sanguineous nature, according to the rapidity of the ulcerative process.

If the ulcerative process has involved the bony tissues, exploration with the nasal probe will reveal the condition of these structures, and if necrosis be

present, the peculiar sensations of dead bone will be manifested.

In some localities, especially in the septum, the involvement of the cartilaginous or bony tissues will be apparent to the naked eye. When the bony tissues have become involved, there is no limit to syphilitic destruction in the nasal organs. The septum may entirely disappear, causing a depression of the tip of the nose; the nasal bones may be destroyed, causing a falling in at the bridge of the organ; the floors of the fossæ may be perforated, producing communications with the mouth; the maxillary sinuses may be penetrated, etc., etc.; in fact the bony structures of the nose may entirely disappear.

Symptomatology.—In primary syphilis the symptoms, chiefly from the effects of the local lesion, are pain in the parts, swelling of the tissues with consequent interference to nasal respiration, the discharge of a muco-purulent secretion, and possibly frontal headache from a slight involvement of the frontal sinuses in the subsequent inflammation.

The symptoms of the secondary type, prior to the formation of the superficial ulcer, are dryness and irritation of the pituitary membrane, speedily followed by a watery discharge, suffusion of the eyes, frontal headache, and possibly slight deafness.

When the ulceration makes its appearance, the discharge assumes a bloody and purulent character, and is freely abundant. Cough and expectoration

together with a decidedly offensive odor, are then added to the above chain of symptoms.

In the tertiary type local pain and swelling, accompanied with interference to nasal respiration, are prominent symptoms. The discharges, at first of the ordinary catarrhal character, assume the nature of thick, bloody pus, in which, when the ulcerative process has become established, may be found shreds of disorganized tissue. The odor from the discharges, particularly when the bony structures are undergoing the necrotic processes, is of a fetid and highly offensive character.

Therapeutics.—The treatment of primary syphilis of the nose consists essentially in the internal administration of mercurials, and the local application of alteratives. Iodoform, either in the pure state or combined with morphia, if much pain be experienced, should be dusted over the ulcers, or if beyond the alæ, applied by insufflation at least once a day after a thorough cleansing of the parts. When the pure drug is used, it can be conveniently applied in the crayon form.

For the relief of the adjacent inflammation the milder vegetable astringents, such as tannic acid or gallic acid (gr. v., gum acaciæ ʒ i.), applied with the insufflator, will be quite serviceable.

In secondary syphilitic manifestations the main reliance should be placed upon systemic medication. The special superficial ulcerations, which have a

natural tendency to run a regular course, will, as a rule, undergo resolution much more speedily under the unaided influence of mercurials. Local applications of caustics seem to irritate the tissues and retard resolution; at least this has been my experience. This fact has been especially noticeable with reference to the mucous patches so frequently met with in the mouth.

In a series of experiments made by me at the Metropolitan Throat Hospital several years ago, I took notes of many cases treated with and without the local application of the solid argentum, and the results, published in the *Medical Record* at the time, proved that the patches disappeared much sooner without the aid of local cauterization.

If the above plan of treatment be employed, local medication will consist only in the daily cleansing of the cavities, both by the physician and the patient, with an antiseptic solution, and the thorough application of some mild resolvent. The preparations of permanganate of potash and bicarbonate of soda, advised in the treatment of atrophic rhinitis, will also be found of excellent service as washes in these cases. As an alterative resolvent, the combination of iodine (gr.v.), iodide of potash (gr.x.), glycerine (℥ ss.), and water (℥ iss.), is an excellent one. Should local cauterization be decided upon, nitrate of silver, fused on the end of an aluminum or silver wire, will afford the best means of performing the operation.

Internally the main reliance should be placed upon preparations of mercury. The biniodide of mercury (gr. $\frac{1}{32}$ to $\frac{1}{16}$), or the bichloride (gr. $\frac{1}{16}$ to $\frac{1}{8}$), administered thrice daily, will generally effect a cure in a few days.

The proper treatment of the tertiary form of syphilitic inflammation in the nasal organs, which forms the majority of the specific cases encountered, is of the greatest importance, since the misunderstanding of the cause, or a hesitation in prescribing the proper remedies, will oftentimes prove most disastrous to the patient.

In these cases iodide of potash in large and increasing doses should be administered at once, and the importance of taking the medicine fully impressed upon the patient. Even in doubtful cases it is a good rule to prescribe the iodide, as its use can do no harm and may often serve to establish the diagnosis.

In administering the potash solution gr. x. three times a day should be prescribed at first, and the doses increased from two to three grains every forty-eight hours until the characteristic eruption makes its appearance, when a return to the amount first prescribed will be necessary.

In extreme cases, xv. to xxv.-grain doses of the drug must be immediately prescribed, and increased gradually as stated above.

Mercurials are of little if any service in tertiary

syphilis of the nose, and consequently their employment is rarely called for. Locally, nitrate of silver applied on the end of a probe in the manner stated above is extremely useful, not only in healing the ulcers but also in preventing their spreading.

Iodoform may also be used, but its action is not as speedy as argentum, and its peculiar odor is a decidedly objectionable feature.

After the ulcerations have disappeared, the local application of astringents must be persevered in for some time before the membrane will resume its normal condition.

The insufflation of medicated powders both by the physician and by the patient are very beneficial in these cases. Of these medicaments, zinci chloridi (gr. v. : ʒ i.), potassii permanganat. (gr. x. : ʒ i.), and zinci iodidi (gr. v. : ʒ i.), as prepared in Chapter VII., are especially efficacious. When the disease has progressed beyond the above stage and necrosis is going on in the bony tissue, the removal of the dead portions by surgical interference is absolutely necessary.

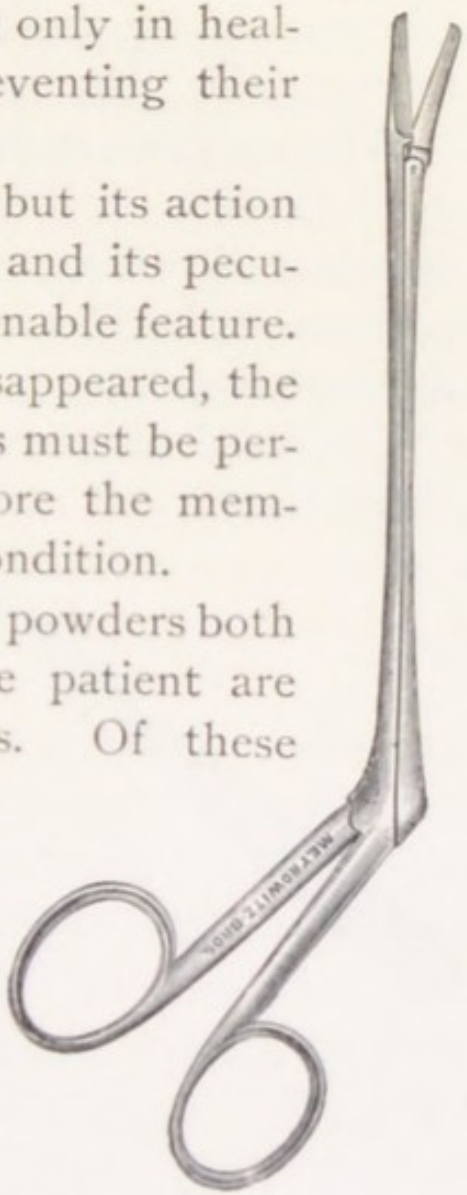

FIG 30.
ALLIGATOR FORCEPS.

When the bony structures are extensively involved, the pathological action having been going on

for a long time, large necrotic masses will be found in the cavities, either entirely free or but loosely attached to the healthier tissues. These particles can readily be removed by means of the alligator forceps (Fig. 30).

When a small radius of bone is involved, and has not separated itself from the neighboring structures, or when the destructive action is confined to the periosteum itself, some other manner of instrument must be employed.

The nasal curette will be found indispensable in these cases.

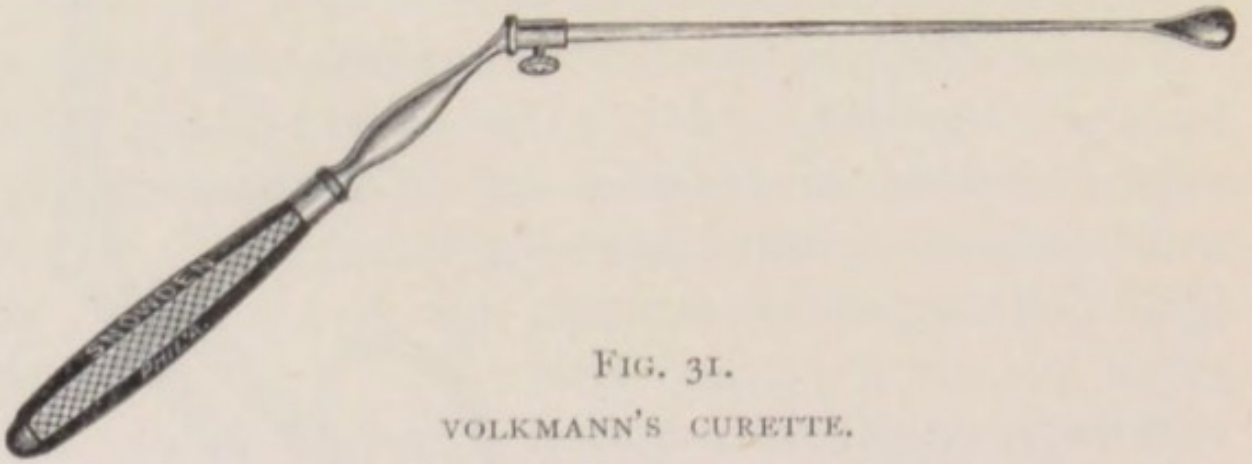

FIG. 31.

VOLKMANN'S CURETTE.

The curette consists of a circular or oblong knife fitted to a straight or curved shank.

The dead tissue is removed by scraping the affected bone, the operation being repeated until all the necrosed portions have been removed.

In diagnosing the presence of dead bone in the nasal cavities, an ordinary exploring probe can be utilized, and the characteristic roughness or crepitus be easily demonstrated.

When the necrosed tissues are of small calibre or located deeply in the fossæ, small fistulous openings can usually be detected, which, when explored, lead to the diseased structures. These openings, enlarged if necessary, will serve as channels through which necrosed particles of bone, if unattached, can be removed.

When the necrosed bone is prominently exposed to view, as is often the case when the septum and free edges of the turbinated bones are involved, they can be safely and expeditiously removed by some form of cutting forceps. The nasal cutting forceps described in the chapter devoted to deviations of the septum will be very useful in these cases.

In the healing of syphilitic ulcerations, contraction by the resultant cicatrices forms quite a serious complication; therefore, while the healing processes are going on, the case should be under constant observation, and the knife resorted to when the conformity or usefulness of the organ is about to be impaired.

Many cases of syphilitic stenosis, particularly in the deeper recesses of the fossæ, constantly occur, which could easily be prevented by proper surgical interference.

CHAPTER X.

STRUMOUS RHINITIS.

Definition.—A chronic inflammation of the nasal organs superinduced by the cachexia following exhaustive diseases.

Etiology.—In most works devoted to the study of the nasal organs, an hereditary scrofulous taint is ascribed as the most prominent cause of this affection. For reasons fully set forth in the preceding chapter, I have excluded scrofula from the causes of this form of nasal inflammation. If this theory be the correct one, strumous rhinitis may be caused by any disease which from its activity has markedly decreased the vital powers of the patient.

Among these affections, diphtheria and the exanthemata, particularly scarlet fever, are the most prominent. On account of the danger of this complication, the importance of subsequent treatment in these devitalizing affections cannot be overestimated, since many cases of strumous rhinitis could undoubtedly be prevented by proper medication.

Rhinoscopic Examination.—Occurring as a rule in

infants and young children, nasal exploration is generally a difficult matter and oftentimes an utter impossibility. In these cases the peculiar fetid odor and the encrusted character of the discharges, together with a history of the case, will offer sufficient features to insure a correct diagnosis. When exploration is possible, the fossæ will be found blocked up with an encrusted and greenish-colored muco-purulent discharge of a decidedly offensive odor. When the cavities have been thoroughly cleansed, the membranes will be seen to be slightly swollen, of a darkish-red color in some localities, and of a decidedly pale color in others. Superficial ulcerations or, more properly speaking, erosions of the mucous surfaces are a prominent feature of this affection.

In two cases that have come under my personal observation, well-defined excavated ulcers, which were controlled with the greatest difficulty, were encountered.

Symptomatology.—The constant discharge of the greenish-yellow muco-purulent secretions is the most annoying symptom of this form of catarrhal inflammation. In young children, who make very little if any efforts to dislodge and discharge the secretions, but, on the contrary, are continually swallowing them, pharyngeal irritation is present in a marked degree, producing a frequent, loose cough.

Difficulty in breathing through the nose, espe-

cially in younger subjects, is always a prominent symptom and principally due to the blocking of the cavities with the inspissated mucus.

The aural cavities are, in nearly every instance, involved in the catarrhal inflammation. Inflammations of the middle ear, with all the accompanying symptoms, such as pain, perforation of the drums, and fetid discharges from the external canals, are of frequent occurrence, and are simply examples of extension of the inflammation through the Eustachian tubes.

Therapeutics.—This affection, occurring in weakened and debilitated subjects, the first indication from a therapeutical standpoint is the removal of the cachexia.

Plenty of out-door exercise, with special injunctions against confinement in large and poorly ventilated schools, will do much towards removing the systemic condition. Relief from study is also a great help in these cases, children generally picking up much faster when the brain is given absolute rest. In city-bred subjects, a change to country air will oftentimes do more towards strengthening the body than any system of medication.

Internally the salts of iron, either singly or combined with quinine or strychnia, should be prescribed. An excellent and at the same time extremely palatable preparation of iron will be found in the solution of the malate.

The local treatment must be of the simplest nature.

Mild antiseptic sprays should be employed two or three times a day, and the cavities kept as free from the secretions as possible. The simple carbolic acid solution (gr. i. : ℥ i.), or the same preparation with sodæ bicarb. (gr. x.) added, will answer every purpose.

In the home treatment of young children, the syringing of the nose is, as a rule, a difficult matter. The cleansing must then be performed through the agency of the hand-ball spray.

As an astringent application, either the officinal glycerole of tannin or the extract of pinus Canadensis will prove satisfactory remedies.

In young children, when it is impossible to make post-nasal applications, the cotton pledget should be passed through the anterior nares, as far back as possible into the posterior nasal cavities, and the mucous membrane touched as thoroughly as practical.

In these cases the application of the astringents in the spray form will probably be the most efficacious plan of treatment. Tannic acid (gr. v. : ℥ i.) or ferri et aluminis sulph. (gr. ii. : ℥ i.) can be used to advantage in the spray form.

Argenti nitras is counterindicated in strumous rhinitis.

I have frequently seen many persistent cases of

chronic catarrhal inflammation superinduced by the unwarranted use of this drug.

Nitrate of silver is a direct stimulant to the mucous membrane, and its abuse, although producing at the time a seeming improvement, is sure to be followed by a decided retrograde effect upon a catarrhal membrane.

Local treatment will be productive of very little benefit unless it be accompanied by proper attention to hygiene.

CHAPTER XI.

HAY FEVER.

Definition.—A periodical acute inflammation of the upper air passages superinduced by an idiosyncrasy in the persons affected.

Etiology.—The most generally accepted theory with reference to the etiology of hay fever is that it is caused by the pollen of certain grasses or flowers. The hay made from the early grasses, hence the name hay fever, is probably the most prolific cause. The emanation from the rose, hence the name rose cold, is likewise a frequent cause. The emanations from animal as well as vegetable matter, and from certain drugs, especially ipecacuanha, and likewise the dusts from many articles, are also prime causes of hay fever.

Pathology.—Attacks of hay fever are undoubtedly due to some peculiar pathological condition of the mucous membrane lining the nasal fossæ.

Sajous, in his most excellent work, has clearly proven the sensitive locality to be the olfactory region.

The olfactory region is that portion of the mucous membrane of the fossæ covering the superior tur-

binated bone and upper portion of the middle turbinated body. It is so designated because it is endowed with the sense of smell, on account of the distribution of the olfactory nerve (see Fig. 2). According to Dr. J. N. Mackenzie, the differentiation of one irritant from another resides in the nerve centres themselves, their discriminating power being increased in proportion to their abnormal state.

The irritating substance coming in contact with the sensitive membrane exerts a certain impression thereon, which impression is conveyed through the sympathetic ganglia, and from them to the vasomotor system.

Symptomatology.—Premonitory symptoms of an attack of hay fever present themselves in many instances.

They consist of dryness of the nasal membranes, accompanied with itching, paroxysms of sneezing, conjunctival irritation, and slight frontal headache. In the generality of cases, the symptoms characterizing the attack itself are akin to those manifestations presented by an aggravated case of acute coryza.

The affection is generally ushered in with violent itching, accompanied with frequent paroxysms of sneezing, chilly sensations, and systemic weakness. These symptoms are speedily followed by nasal occlusion, profuse watery discharge, and lachrymation.

The transition from the watery secretion to a pro-

fuse mucous or muco-purulent discharge, marks what might with propriety be called the second stage of the affection. In this stage, tensile pain, difficulty in nasal respiration, impairments of the voice, cough, and expectoration are the most prominent symptoms.

Later on, when the communicating organs become involved in the inflammatory processes, frontal headache, pain in the ears, deafness, and conjunctivitis add to the sufferings of the patient.

When asthma occurs as a complication with hay fever, the peculiar train of symptoms characterizing this affection are added to those tabulated above. Hay fever, although there are many exceptions to the rule, occurs in the generality of cases but once a year. The most prevalent seasons are summer and early fall; July and August being the months most favored.

With reference to the duration of the attacks there is an exceedingly wide margin, resolution taking place in two or three weeks in some cases, while in others the affection lasts for from two to three months.

With each subsequent attack there is a liability, not only to an increase in the duration, but also in the intensity, of the manifestations.

Therapeutics.—The treatment of hay fever resolves itself into two forms—viz.: prophylactic and palliative.

The prophylactic treatment consists in so altering the character of the sensitive nasal membrane as to render it incapable of being influenced by the peculiar emanations, which are the exciting cause of the disease.

According to Sajous, who certainly deserves much credit for his investigations in this direction, the disease can not only be prevented, but a radical cure effected in the majority of cases by cauterization of the mucous membrane of the olfactory region. His plan of treatment is as follows:

"The nasal cavity being dilated and illuminated, the cautery knife is introduced gently and applied flatwise to the most anterior portion of the mucous membrane lining the olfactory region. If the part is not sensitive the patient will not wince, the sensation being hardly more than a slight itching. If it is hyperæsthetic, a feeling of intense itching or burning will be complained of, followed, in some cases, by lachrymation. As soon as evidences of abnormal sensitiveness appear the circuit should be closed and the parts singed, which destroys the superficial nervous filaments. One spot being cauterized, another sensitive spot is searched for, and, when found, the current is again applied. In this manner the entire olfactory area should be gone over, until the instrument can be applied to any part of the membrane without exciting reflex symptoms or causing the violent itching or burning above referred to."

In the performance of this operation not more than two or three spots should be cauterized at one sitting, and the parts attacked should be at some distance from each other, so as to avoid large superficial abrasions.

I have tried the above method of operation, carrying out the author's suggestions as minutely as possible, with extremely gratifying results.

Several years ago I removed a group of nasal polypi from a middle-aged lady who suffered from periodical attacks of hay fever. After extracting the tumors, which were located on both sides and principally attached to the middle turbinated bones, I thoroughly cauterized the tissues with a view to the destruction of the base of the growths.

In the fall of the same year I received a visit from the lady and was surprised to learn that she had escaped her regular annual attack of hay fever, which had hitherto made its appearance in August. I supposed at the time that the removal of the polypi had been the cause of the non-appearance of the hay fever, but have since been convinced that the credit should be ascribed to the action of the galvano-cautery.

The destruction of the sensitive points with the stronger acids should never be resorted to, not only on account of the extreme amount of pain caused by the operation, but also on account of the great degree of reaction caused thereby.

If acid application be decided upon the milder forms, such as the glacial acetic or the monochlor acetic acids, should be chosen.

The acid treatment, however, when compared with the galvano-caustic, is but a poor substitute.

The destructive plan of treatment should be inaugurated at least six weeks prior to the expected time of the attack, and should be followed by some mild, local, astringent application up to the anticipated date.

As a prophylactic, the change of residence of the sufferer and a complete alteration of his mode of life will do much.

Victims of hay fever are well aware of the benefits to be derived by this plan of treament, and yearly migrate to some favorite locality in which they have a partial or complete immunity. The palliative plan of treatment consists in the internal administration of medicines to counteract the neurasthenic condition, and the local application of solutions to subdue the nasal inflammation. For the first indication several of the antispasmodics have been highly lauded. Of this class of remedies valerian, assafœtida, valeriante of zinc, and Hoffman's anodyne are the most frequently prescribed.

The inhalation of the fumes of nitrated papers is very efficacious in many cases in mitigating the intensity of the paroxysms.

The formula for the manufacture of nitrated pa-

pers is as follows: Saturate white blotting-paper in a solution of potass. nit. and aquæ (gr. xx.: ℥ i.) and when dry cut into strips about three inches long and one half inch broad. In the preparation of these papers their efficacy may be greatly enhanced by the incorporation of any of the volatile oils, particularly ol. pini sylvestris, ol. cassiæ, and ol. santal. Compound tincture of benzoin and spirits of camphor may also be added with benefit.

In some instances antipyrine and phenacetine (gr. v.–x.) seem to exert some beneficial effect upon the paroxysms. Local applications, except of the blandest character, are productive of very little beneficial effect. On the contrary, however, they are apt to add to the sufferings of the patient by acting as irritants. The only drug which seems to have any controlling action upon the local manifestations is cocaine. The four per cent. solution should be used and the medicine applied thoroughly in the spray form once or twice a day. The good effects of cocaine are due to its peculiar contractile action upon the blood-vessels, which reduces the local inflammation. Cocaine also acts as an anæsthetic, thereby greatly mitigating the hyperæsthetic condition of the olfactory membrane.

CHAPTER XII.

CATARRHAL AFFECTIONS OF THE NASO-PHARYNX.

INFLAMMATIONS of the naso-pharynx, as with those situated in the other portions of the nasal organs, may be either acute or chronic.

ACUTE CATARRH.

Etiology.—Acute inflammation of the naso-pharynx is most frequently caused by an extension of the inflammatory process either from the anterior nasal cavities or from the pharynx.

The many causes which will produce acute inflammation in these latter localities, such as inhalation of dust, climatic changes, exhaustive diseases, etc., may likewise excite catarrhal action in the mucous membrane lining the naso-pharynx.

Pathology.—Although many deny the existence of acute idiopathic catarrh of this region, it is an absolute fact that careful observation will oftentimes reveal instances of this affection. As is the case with acute rhinitis, they are the result of some special irritation of the sympathetic system, pro-

ducing dilatation and engorgement of the blood-vessels.

Rhinoscopic Examination.—If seen during the earlier stages the affected membrane will be found to be dry and tense and of a bright-red color.

Later on, when secretion has become established, the parts will be bathed with mucus or muco-purulent matter, which when cleared away will reveal a swollen and highly inflamed membrane.

If the Eustachian tubes have become involved, their orifices will be found considerably narrowed and the eminences in which they are imbedded enlarged and congested.

Symptomatology.—A sense of dryness in the parts, with possibly slight difficulty in swallowing, are the only symptoms noticeable in the first stage of this affection. After the lapse of from twenty-four to forty-eight hours, a thin mucous discharge makes its appearance, which gradually becomes thicker and assumes a somewhat purulent nature. Constant hawking and expectoration from the dropping of the secretions in the mouth are then prominent and annoying symptoms.

The voice is always more or less affected, and is either hoarse or raspy. Ringing in the ears, together with darting pains in the neighborhood of the Eustachian tubes if these canals be affected, are also prominent symptoms.

When acute catarrh of the naso-pharynx is caused

by an extension of the inflammatory action from the anterior nasal cavities, or from the pharynx, or these latter affections are coincident to the former one, the symptoms of acute rhinitis or pharyngitis may be added to the above.

Prognosis.—The recognition and proper medication of this affection is of the utmost importance, since if unattended it will have a tendency to resolve itself into chronic catarrh of the naso-pharynx, a most persistent and troublesome disease.

Therapeutics.—In the earlier stages of this affection, the same indications present themselves as in acute rhinitis, hence the plan of general treatment advocated in the latter form of inflammation will answer equally well here.

Local treatment, however, should be of a more decided character than that prescribed in acute rhinitis, not only on account of the danger of the establishment of chronic inflammation, but also from the fact that stronger solutions can be borne in the posterior nares than in the anterior cavities. The posterior nasal cavity should be cleansed at least twice a day with some form of antiseptic wash; carbolic acid (gr. i., aquæ ℥ i.), or combined with bicarbonate of soda (gr. v.) in the same solution, will be most generally useful.

In spraying the posterior nasal cavity, a curved hard-rubber spray tube will be more serviceable than Sass' glass tubes, because the conformity of the

former instrument admits of its being farther introduced into the opening.

Syringing of the nose through the anterior nares with the instrument described in Chapter IV. will also be serviceable in cleansing the posterior cavity.

After the diseased membrane has been cleansed, some astringent application should be made. Glycerole of tannin and the extract of pinus Canadensis, applied thoroughly to the parts by means of cotton pledgets, in the manner already described, are excellent remedies.

Insufflation of the preparations of tannic acid, gallic acid, catechu, etc., tabulated in Chapter VI., will also have a tendency to hasten resolution.

Whenever it is practical for the patient to perform post-nasal insufflation, it should be advised. The simple glass auto-insufflator described in Chapter IV. will answer equally well for post-nasal applications, if the glass tube be made a little longer and curved at a right angle, and a little rubber ball substituted for the mouth-piece.

Insufflation of pure boracic acid will not only have a tendency to diminish the intensity of the attack, but will also, if employed sufficiently early, frequently abort the affection.

CHRONIC CATARRH.

Etiology.—Chronic catarrh of the naso-pharynx is an exceedingly prevalent disease in this section of

the globe. The frequency is undoubtedly due to the changeableness of the climate and the abundance of moisture in the atmosphere. Frequent attacks of acute inflammation, especially if they be allowed to take their own course, will produce the disease under consideration. Chronic pharyngitis, particularly that type so frequently found in hucksters, out-of-door speakers, etc., is likewise a prime cause of this affection, the membrane being involved by contiguity.

Anterior hypertrophies, nasal polypi, septal deviations, and the other causes of nasal stenosis, by closing up the anterior outlets for the secretions, are also prime causes of this affection.

Pathology.—The great number of glands with which the membrane covering the naso-pharynx is supplied, renders this portion of the body peculiarly susceptible to inflammatory action. The glands having become once involved, either through the sympathetic and vaso-motor systems, or from the direct irritation of the discharges from contiguous parts, they have a decided tendency to enlarge, until finally, unless the disease has been arrested, extensive glandular vegetations have been produced.

Rhinoscopic Examination.—When the characteristic muco-purulent secretion has been washed off, the affected membrane will be seen to be of a dull-red color, somewhat swollen and slightly indented from ulcerated action, if the disease be sufficiently well advanced.

In the majority of old cases, the membrane presents a nodulated appearance.

This phenomenon is due to glandular proliferation, and is exceedingly well marked in some cases, the little bunches of enlarged glands being separated by seeming ridges in the tissues. These little glandular elevations are the foundation for the adenomatous tumors so frequently found in the vault of the pharynx.

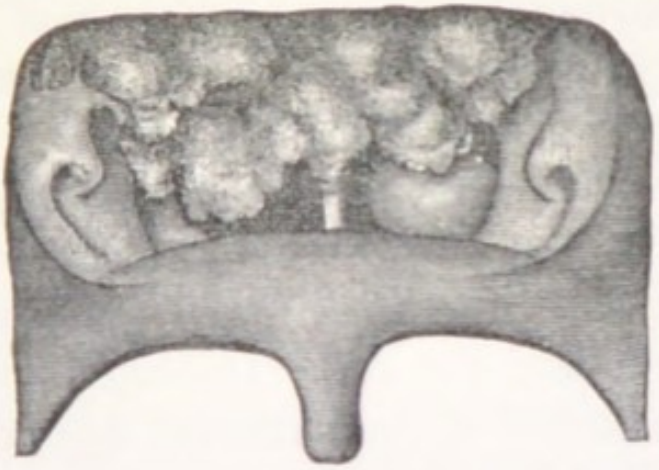

FIG. 32.

GLANDULAR HYPERTROPHY (Lefferts).

Symptomatology.—The most frequent and at the same time annoying symptom of chronic naso-pharyngeal catarrh is the constant dropping of the mucus into the mouth. This is more noticeable in the morning, from the accumulated secretions of the night striving to effect an exit.

Cough and expectoration with a constant feeling as if something were sticking behind the palate are coexistent with the discharge. As the disease pro-

gresses, the nature of the secretions becomes somewhat altered. Instead of being chiefly of a mucous character and mostly of a white color, they partake somewhat of a purulent nature and are much thicker and of greenish cast. The secretions may likewise be occasionally streaked with blood on account of superficial ulceration. As the disease progresses, the peculiar catarrhal odor, which is at first scarcely noticeable, begins to manifest itself, and, after a time, becomes extremely offensive. Tinnitus aurium and deafness, likewise vocal impairments, are frequent concomitant symptoms.

Prognosis.—This disease is of especial importance on account of the liability of the infection of neighboring structures, if it be allowed to take its own course.

In this climate, especially among the singing fraternity, a majority of the catarrhal affections so frequently found in the vocal cords and neighboring vicinity are preceded by post-nasal catarrh, showing that an intimate relationship exists between the various membranes lining the air passages.

Therapeutics.—Catarrh of the naso-pharynx being in many instances superinduced by diseased action in contiguous parts, the neighboring structures should be thoroughly searched, and the pathological conditions, if there be any, removed before any attempt be made to effect a radical cure. Thus if the anterior passages are blocked up from the presence of tumors, deviations of the septum, or

other cause which necessitates the secretions finding an outlet through the mouth, the obstruction must be removed, before any hope of curing the naso-pharyngeal trouble be entertained.

Locally, the same general plan of treatment advocated in nasal catarrh must be followed. The membrane must be thoroughly and systematically washed both by the physician and the patient, and the cleansing followed by astringent applications. The preparations of carbolic and salicylic acid, recommended in Chapter VII., will answer equally well here, when applied by means of the hard rubber curved post-nasal spray. When the discharges are of an offensive character, permanganate of potash (gr. x.: aquæ ʒ i.) will best serve to counteract the fetid odor. For the patient's own use, an ordinary curved atomizer attached to the hand-ball spray apparatus will answer. When the use of the post-nasal spray is impracticable in the hands of the patient, the nasal syringe described elsewhere will act as an efficient substitute. Astringent applications can be made to the naso-pharynx, in the form of spray, by means of cotton pledgets and by insufflation. Of these three methods of treatment I much prefer the curved probe armed with the cotton pledget, because the medicine can be more perfectly localized. If the disease be of recent origin, iodide of zinc, gr. x. to ʒ i. each of glycerine and water, will, if persisted in, generally effect a

cure. If the affection is of long standing and the tissues have become somewhat devitalized, the action of a direct stimulant is called for at the commencement of the treatment, in order to bring the mucous membrane into such a condition that it can be acted upon by ordinary astringents. As a stimulant in these cases, nitrate of silver is of great service. In very old cases the treatment can be inaugurated with xv.–xx. gr. solutions. After the lapse of from two to three weeks the strength of the argentum solution should be reduced one half, and entirely discontinued at the end of another fortnight. I seldom make use of this drug longer than a month in any individual case of naso-pharyngeal catarrh, and have had very satisfactory results. After the mucous membrane has been brought into a responsive condition by the above plan, the cure can be completed by the aid of the iodide of zinc preparation, or the preparation of iodine and glycerine, recommended in Chapter VII.

For the patient's home use, the milder vegetable astringents, applied in the powder form by means of the post-nasal insufflator, will hasten resolution.

In well-marked and long-standing cases of catarrh of the naso-pharynx, glandular hypertrophies are invariably met with. In some instances, owing to the amalgamation of enlarged bodies of glands, distinct and well-marked tumors are formed; these are called adenoma.

The appearance of the growths varies greatly in different cases.

In some instances they present the form of many little distinct rounded eminences, while in others the enlarged glands are grouped together in grape-like dependent bunches.

These tumors being not only obstructive but a direct source of irritation, their removal is paramount.

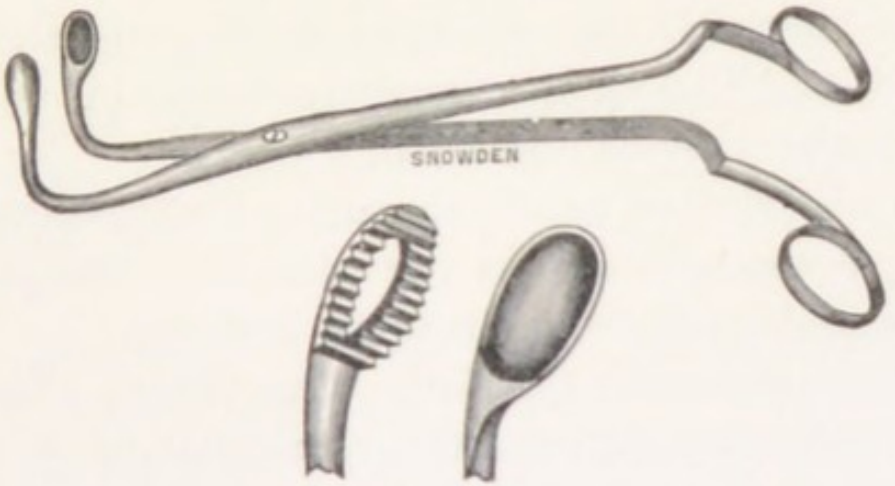

FIG. 33.

POST-NASAL FORCEPS.

Two methods of operation present themselves—evulsion and cauterization.

When the enlarged glands present themselves in grape-like groups and are somewhat dependent, they can best be removed with the posterior nasal forceps.

In the performance of this operation Stoerck's forceps are the best, inasmuch as the handle is so twisted that the hand holding it will be out of the line of vision.

When the membrane presents a nodular appearance, the little glandular tumors being more or less isolated, the pathological condition can best be removed by the galvano-cautery.

In the performance of this operation any of the straight electrodes illustrated in Fig. 23 can be used, having first been bent at an angle corresponding with that of Stoerck's forceps.

In removing exuberant glandular tissue by the above methods, the cavity must be perfectly illuminated, and the velum drawn forwards by means of tape as heretofore described.

In the skilled hands the use of a protected electrode is unnecessary, as the platinum wire will not be heated until the instrument is *in situ*.

After nasal obstructions have been completely removed, the patient must submit to a regular course of astringent applications.

The success which will follow local medication in these cases will be in direct proportion to the thoroughness with which the cavities have been cleared of abnormal tissues. It is often astounding what a trivial abnormality will act as a direct excitant of nasal catarrh; hence the surgeon in his preliminary examination will let none of the tissues escape his skilled eye.

CHAPTER XIII.

DEVIATION OF THE SEPTUM.

Definition.—A deflection of the septum nares, either to the right or left of the median line.

Etiology.—The vast majority of cases of septal deviations are of a traumatic origin, and occur in early life.

The prominence of the nasal organ, and its liability therefrom to injury, from blows, falls, etc., are well understood. In childhood the softer nature of the tissues also greatly contributes to the frequency of these deformities. Septal deviation is much oftener encountered in males, on account of their greater liability to accidents.

Rhinoscopic Examination.—Deviations of the septum may occur throughout the entire structure, or be confined to the cartilaginous portion.

In the vast majority of cases the latter structure is the portion deformed. When the deflection occurs in the anterior portion of the septum, very little difficulty will be experienced in making out the diagnosis by rhinoscopic exploration, the promi-

nence jutting into the fossa and offering an obstacle to an examination beyond. If now the opposite canal be explored, the diagnosis can be confirmed by observing a depression corresponding to the protuberance on the other side.

The deviation may be so slight as to be scarcely noticeable, or it may create such a deformity as to impinge upon the opposite turbinated bone and produce complete occlusion. The diagnosis in well marked cases can generally be made by external manual examination, the protuberance on one side with the corresponding depression on the other being easily felt.

The depression on the opposite side to the deviation also serves as a diagnostic point in the differentiation of this disease from bony tumors of the septum.

The inclination of the curve may be perpendicular or horizontal, and the entire cartilaginous portion of the septum involved, or only a small part thereof.

The protruding septum may present itself in a great variety of shapes, those most frequently met with, however, being the angular and the round or globular.

The angular protuberance is the deformity met with in the great majority of cases. It is cone-shaped, with the angle protruding towards the opposite turbinated bone. The rounded variety is generally due to a bulging of the cartilage, which produces a globular-shaped prominence. In the latter

form of deviation the entire cartilaginous portion of the septum is generally involved and the resultant deformity marked.

When the bony portions of the septum are involved, the deviation is generally of a serpentine character, the irregularity frequently extending deep into the fossæ.

When the opposite tissues are impinged, ulcerations will be frequently met with, and all efforts, of a medical nature, to remove them will prove fruitless.

Symptomatology.—In mild forms of septal deflection the patient experiences little or no inconvenience, the protuberance offering but slight obstruction to the physiological functions of the nose; in well-marked cases, however, the symptoms are prominent and in direct proportion to the amount of stenosis. When catarrh occurs as a complication, or rather as a result, of deviation of the septum, the lodgment of the imprisoned secretions is a source of continual annoyance. In these latter cases, cough and expectoration from the dropping of the mucus in the throat, together with the peculiar manifestations of nasal catarrh, are always present. The voice, both in singing and in speaking, is always affected. This is especially noticeable during vocalization, a slight deformity oftentimes producing a serious impairment to singing.

As my practice has been largely confined to vocalists, I have had especial opportunity of noticing the

effects of septal deviation, as well as the other causes of nasal stenosis, upon the vocal powers.

It is truly astonishing what an amount of vocal impairment will oftentimes be caused by a trivial amount of nasal obstruction. The timbre of the voice is not only seriously affected, but the vocal cords themselves become, after a time, weakened on account of the extra amount of force that must be exerted to push the tone-waves through the obstructed passages.

Prognosis.—Deviations of the septum, especially in young children, if taken in hand within a short time after the injury, can generally be corrected with very little trouble.

If, on the contrary, the deflection be allowed to take its own course, that which at first was but a trivial affair will become a serious deformity.

Irrespective of the septal irregularity itself, this condition will invariably give rise to the severer types of catarrhal inflammation.

Therapeutics.—If the deformity consists of but a slight bulging of the cartilage and treatment is undergone a short time subsequent to the accident, the septum can generally be righted by forcible twisting with Adams' nasal torsion forceps.

In the performance of this operation, when the patient is placed under an anæsthetic, one blade of the forceps is introduced into each nostril and the deflected portion grasped and wrenched into position.

After the deviation has been reduced in the above manner, some method of after-treatment is necessary to keep the septum in the median line.

Ivory plugs have been highly recommended for this purpose. These instruments are not only productive of much pain, but the results obtained from their use are also highly unsatisfactory.

I have found an excellent substitute for ivory plugs in the sponge tents which are so frequently employed in uterine surgery.

FIG. 34.

ADAMS' FORCEPS.

When used in these cases, sponge tents should be about one and one half inches in length, from one eighth to one quarter in thickness, and from one quarter to one half in width.

When they fit the cavity snugly they exert a continuous pressure upon the septum on account of the swelling of the sponges from the absorption of the nasal secretions.

In the generality of cases, either from neglect or non-observation, relief is seldom sought until the condition is of long standing, and consequently

some severer plan of operation than the one just described must be resorted to.

In describing the different forms of septal deviation, mention was made of the fact that the majority of these deformities were either of an angular or rounded shape.

Since each of these varieties demands a special form of treatment, operations for their radical cure will be divided into two classes — those for the removal of angular deflection and those for the correction of rounded deviation.

The operations for the removal of the angular tumor are two in number—the sawing off of the protruding portion of the septum, and the snipping off of the projecting cartilage with some form of cutting forceps.

The former of the above methods is performed by means of an instrument called the nasal saw. The saw described in Chapter VII. will be found very useful in the performance of this operation. Its ready adaptability to the upward or downward movement, together with its fine edge, makes it especially applicable to the removal of septal deviations. The nasal saw can likewise be operated by the dental engine or the electric motor illustrated in Chapter VII., the backward and forward movements being created by a special mechanism in the handle of the saw.

In the performance of this operation the nasal

speculum described in Chapter III. will be found of especial service, because when *in situ* it can nowise interfere with the manipulation of the saw.

The nostrils having been well dilated and the cavity illuminated, the saw is to be introduced with the teeth pointing downwards if the deviation be located near the floor of the nose, or *vice versa* if the protuberance be placed too high to admit of the instrument being properly manipulated above.

When the saw is properly placed, it should be moved very slowly at first until the instrument obtain a bite upon the cartilage, when the operation must be completed as quickly as possible.

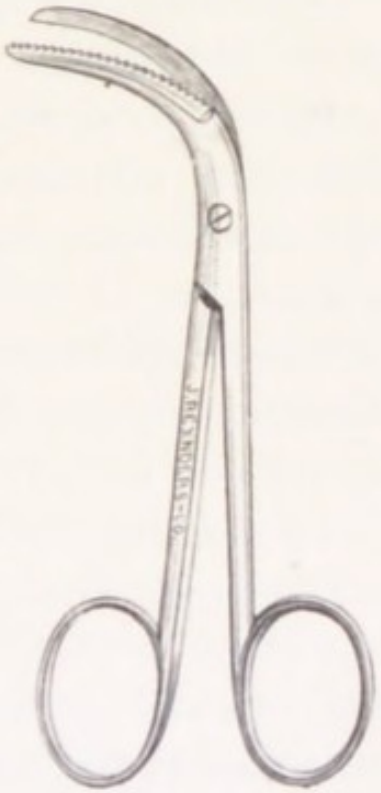

FIG. 35.
THE AUTHOR'S SEPTAL SCISSORS.

For the performance of the second method of operating upon angular deviations, namely, the severance of the protruding cartilage with the cutting forceps, I have designed a special instrument.

This instrument consists of an upper and lower blade united together at a peculiar angle like a pair of scissors. The upper or cutting blade is exceedingly stout and sharp, and curved in such a manner

as to readily surround the protuberance. The lower blade of the forceps is narrow and serrated, so as to be easily passed under the deflected portion of the cartilage and to obtain a hold upon it when the instrument is *in situ*, thus preventing slipping.

When the conformity of the protuberance is such that the forceps can be used, the latter operation presents many decided advantages over that of sawing: the operation is more speedily accomplished; the resultant wound is clean cut instead of being jagged, as is the case when the saw is used; the portion to be removed can be more nicely determined; and resolution is quicker, secondary results being less frequent.

In angular deflections it is not generally necessary to remove the entire cone-like projection. The operation is simply called for to increase the breathing capacity, and to allow of the escape of the imprisoned secretions. Sufficient room can oftentimes be obtained, by snipping off only a portion, to admit of the proper performance of the above functions. By an observance of this point, perforations of the septum can frequently be avoided, there being left sufficient cartilaginous structure to form a basis for regeneration. This is a decided advantage, the troublesome ulcerations which generally follow perforations of the septum being avoided. When more respiratory room is needed than this plan of operation provides, as is frequently the case with

singers and speakers, the method advocated for the reduction of the rounded variety of deviation, to be presently described, can be used with satisfactory results.

Very many methods, for the correction of the rounded variety of septal deviation, have been from time to time suggested, each of which has had earnest advocates. The earliest plan, as far as can be ascertained from the literature of the subject, consisted in forcibly twisting the deflected cartilage back to its normal position.

As has already been stated, this method can only be successful in the treatment of recent injuries, especially in young subjects.

As an outgrowth of the torsion method, the idea of reducing the deformity by fracturing the septum was suggested.

In the performance of this operation, the patient is first put under the influence of an anæsthetic, and then the attempt at fracturing is made by sudden and forcible revulsion with Adams' forceps (Fig. 34). The after-treatment consists of the plugging of both nostrils with cotton previously treated with a solution of carbolic acid, in order that the fractured cartilage be retained in the median line. The cotton plugs should be removed every forty-eight hours; the cavities thoroughly cleansed with antiseptic solutions, and fresh tampons applied until the septum has become well united.

Success can only be expected in cases of moderate deflection, and when, on account of the age of the patient, the septum is of a firmer nature.

The third plan of treatment recommended is the removal intact of pieces of the septum, by resection or by punching out the desired portions by means of specially constructed instruments. The best method of resection is that suggested by Dr. Ingals. His operation consists in making an oblique incision over the prominence, and then dissecting the membrane from the cartilaginous septum for a sufficient distance on each side of the cut. A triangular piece of cartilage, the base of which is at the floor of the nose, is then carefully cut out, and the severed mucous membrane stitched up. The operation is completed by forcing the wounded septum into a normal position and plugging the nasal cavity to retain it there.

The difficulty of performing this operation, especially in younger subjects, renders it impracticable to the general practitioner. The great vascularity of mucous membrane lining the nasal fossæ also offers another decided objection, the constant flow of blood obscuring the subsequent steps.

Perforation of the septum, with a view to the removal of deviation, is performed by means of a set of instruments called nasal punches.

The blades of these punches may be fashioned in any shape, the principal styles used, however, being

the round and the elliptical. The chief objection to this operation is that it produces a wound that is exceedingly tedious in the healing, from the excitation of ulcerative action.

With reference to the beneficial effect produced upon nasal respiration by this operation, I fail to see where the improvement comes in. The removal of a little button of bone without any further oper-

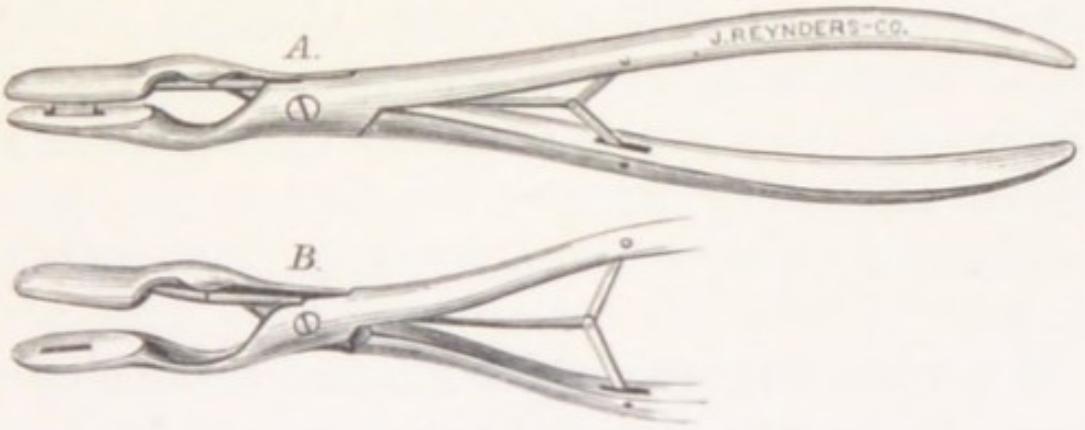

FIG. 36.

AUTHOR'S CONCEALED KNIFE AND FORCEPS.

ative procedure for the straightening of the crooked wall, unless, perchance, the deflection be but slight, or the entire protuberance be punched out, will simply allow the air currents to pass from one fossa to the other through the artificial opening.

The plan of operation which has been most successful in my hands is a combination of torsion and cutting. It is performed by means of an instrument especially designed for that purpose.

This instrument consists of a stout pair of straight

nasal forceps, the blades of which have been slit for the play of a knife.

The knife portion is so arranged that by closing the forceps its cutting edge will make its appearance on the inner surface of the blade to which it is attached, cross the intervening space, and enter the slot prepared for its reception in the opposite blade.

The idea of giving to the knife the above mechanical action is to afford protection to the walls of the nose during the introduction of the instrument, the cutting edge being entirely concealed when the blades of the forceps are opened sufficiently to allow of their passage through the nares.

When the instrument is *in situ* and the blades are approximated to their fullest extent, the knife penetrates the septum completely and enters the orifice designed for its reception in the opposite blade.

The method of operation employed in the majority of cases is as follows: the instrument being introduced with the blade in which the knife is concealed on the convex side of the deformity, an oblique incision is made by a closure of the forceps, the septum being immediately afterwards twisted towards the median line, a considerable amount of force being employed.

The forceps are now opened, and without removal a second incision, crossing the first like the letter ×,

is made, and followed as before with a forcible twisting of the cartilage.

The after-treatment is of the greatest importance, and consists in the retention of the straightened septum in the median line.

For reasons hitherto given the employment of hard rubber or ivory plugs is unsatisfactory. Sponge tents so constructed as to fit the parts snugly form an exceedingly efficient substitute. When properly conformed, these little instruments are easy of adjustment, readily retained, not uncomfortable, and exert a constant and gentle pressure. The largest size possible to be used should be immersed in a carbolic solution and introduced on the side of the deformity immediately after the operation. After having been retained for about forty-eight hours, it must be removed, the cavity thoroughly cleansed with an antiseptic spray, and a fresh tent inserted.

According to my experience this plan of operation overcomes many of the objections found in some of the older methods.

Paramount above everything else, it is speedily performed, and not requiring delicate manipulation, it does not need an expert.

With reference to children it is especially to be recommended, not only on account of their unwillingness to submit to surgical interference, but also on account of the small dimensions of the anterior

cavities, which render impossible many of the manipulations necessary to the more formidable operations.

When the deviations are located deep in the fossæ, the bony septum being involved, drilling, by means of the instruments described in Chapter VII., will offer the best plan of operation.

CHAPTER XIV.

TUMORS OF THE NOSE.

TUMORS of the nose are of frequent occurrence and of diversified form. Classified according to frequency of occurrence they are: polypoid growths, cartilaginous tumors, bony tumors, and malignant growths.

The majority of benign tumors met with in the nasal fossæ are of a polypoid nature.

There are two distinct varieties of these tumors: the myxomata or gelatinous polypi, and the fibromata or fibrous polypi.

In some special works, the glandular swellings so commonly met with in the vault of the pharynx, and fully described in Chapter XII., are arranged under this heading and called adenoma or adenoid tumors.

The gelatinous polypus is the most common form of nasal tumor. It generally springs from the turbinated bones, the inferior border of the middle and lower spongy bodies being the most favorite site.

Etiology.—Chronic catarrhal inflammations of the

nasal organs are the cause of the formation of these tumors in the majority of cases.

Their formation is due to hypertrophied tissue, which becomes elongated from the conformity of their abode and constricted at the base from the constant dragging of the weighty mass.

Rhinoscopic Examination.—Under the light of the rhinoscope gelatinous polypi are of a grayish-white color, pyriform in shape, have a smooth surface, and are somewhat translucent. When protruding into the anterior nares exploration with the nasal probe will easily confirm the diagnosis, the tumor being soft to the touch, easily indented, and, when not too large, freely movable.

Myxomata may occur singly or, as is most frequently the case, in groups, and may be unilateral or bilateral.

The only pathological condition with which these growths can in anywise be confounded is hypertrophy of the mucous membrane.

The peculiar diagnostic symptoms of the latter variety of tumefaction—the conformity of the enlarged tissues, the color of the membrane, and the effects of probal pressure—should never fail to differentiate between these two varieties of nasal disease. When hanging down into the posterior nares, the rhinoscopic mouth mirror will reveal the character of the tumor quite easily. Its dependent nature, pyriform shape, and translucent character, together

with its somewhat lengthened pedicle, are plainly shown.

Symptomatology.— The principal manifestations occasioned by the pressure of polypi in the nose are due to obstruction, which is more or less complete according to the size and number of the tumors.

Nasal respiration is not only greatly impaired, but the discharges consequent to the catarrhal inflammation are prevented from escaping through the anterior nares, and are either blocked up in the sinuses or drawn down through the posterior nares and emitted with much difficulty through the mouth.

Occasional hemorrhagic attacks, likewise all the symptoms of nasal catarrh, such as headache, deafness, impairments of the voice, and a constant discharge of mucus or muco-purulent matter, are present.

In damp weather, on account of the hygrometric nature of their contents, swelling takes place in these tumors, producing an aggravation of the above symptoms.

Therapeutics.—Many plans of treatment, other than their direct removal, have been from time to time recommended for the extirpation of gelatinous polypi. The principal of these methods are injection, destruction with acids, and the local application of powerful astringents.

The injection treatment consists of the throwing

into the body of the tumor, by means of an ordinary hypodermic syringe armed with a long curved needle, a few drops of some solvent for the purpose of producing dissolution.

The medicaments generally recommended are: tincture of iodine, sulphuric acid, carbolic acid, and glacial-acetic acid. Except in very small growths, injection offers but little hope of producing the desired result; in cases, however, in which a trial is made, I would suggest the injection of tincture of iodine, as the employment of this solution will be followed by less inflammatory reaction than the others tabulated above.

The local application of the stronger acids, such as chromic or sulphuric, to the body of the polypoid tumor has but few advocates. The pain consequent to the application, and the subsequent sufferings of the patient from the local inflammation excited, when taken into consideration with the slight chances of success offered, should always influence the surgeon against undertaking this barbarous plan of treatment.

Frequently repeated applications of the stronger mineral solutions, with a view to the gradual shrivelling of the gelatinous mass, is probably the best plan of medical treatment in small tumors, and worthy of a trial where other and more radical methods are refused.

The salts of iron are highly extolled by those who

have used this method. In the few cases in which I have endeavored to remove these tumors by local application, tincture of iodine seems to have been followed by the best results.

The benefits to be derived from medical interference, however, are insignificant when compared with the brilliant results obtained by surgical operations.

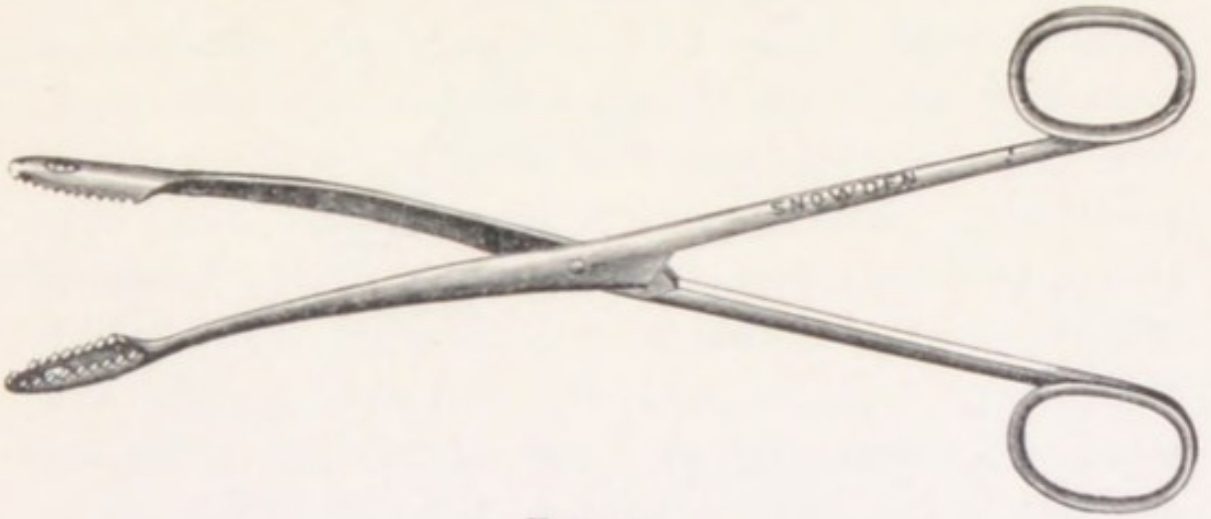

FIG. 37.

POLYPUS FORCEPS.

No matter how trivial the growth may be or where it may be located with reference to the nasal fossæ, surgery offers the safest, speediest, and most painless means of extirpation.

The surgical operations for the removal of myxomata are two in number: evulsion, or the forcible tearing off of the mass; and snaring, or the encircling of the tumor with fine wire and cutting through it when so engaged. The former of these operations

is performed with that ancient and well-known instrument, the nasal polypus forceps.

The nostrils being properly dilated and the head thrown well back, the blades of the forceps are passed beyond the body of the growth, the pedicle firmly grasped, and the operation completed by a forcible twisting of the growth.

If the pedicle could always be grasped in the above manner, the operation of evulsion would be quite a simple affair, but, as a rule, the attachment is so high up, or the passages so thoroughly blocked, that the accomplishment of this feat is an utter impossibility. The operation then resolves itself into the simple engagement of as much of the body of the growth as possible, and the tearing of it off with the forceps. In the majority of instances this is a decidedly unsatisfactory procedure, not only on account of the small portion of the mass likely to be removed, but also on account of the free hemorrhage which is always excited, and which necessitates a postponement of the operation before much has been accomplished. The process of twisting, too, is decidedly painful, and this feature, coupled with the fact that there is always a liability of injuring not only the soft structures of the nose, but the bony tissues as well, should incline the surgeon towards the employment of a more humane method of treatment.

The removal of polypoid growths by means of the

snare is undoubtedly the neatest and most satisfactory operation the surgeon is called upon to perform in the nasal fossæ.

Very many instruments have been invented for the snaring of nasal tumors, the majority of which are based upon the fundamental principle evolved by Dr. Jarvis in his snare (see Fig. 24).

A serious objection to many of these appliances is

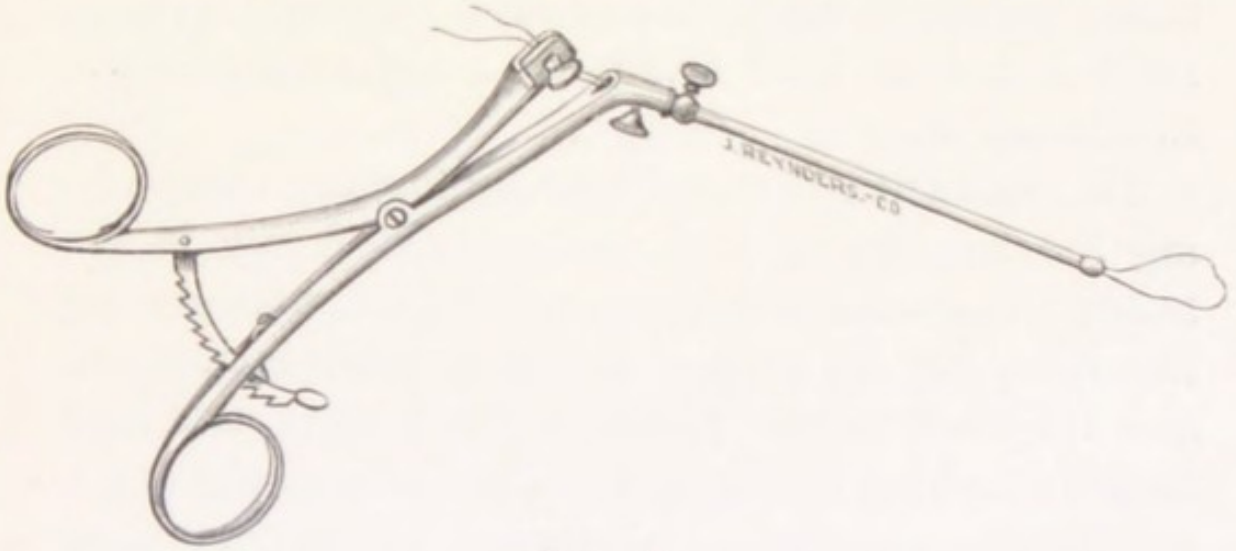

FIG. 38.

AUTHOR'S NASAL SNARE.

that both hands are required to manipulate them, one to hold the instrument and the other to turn the nut which tightens the wire. I have had constructed a form of snare by which this difficulty is overcome, one hand being sufficient to manipulate it, the other being left free.

The instrument is threaded by passing the ends of fine piano wire through the little apertures in the

distal end of the canula, leaving a sufficiently large loop exposed to admit of its introduction through the nares.

When the tumor is engaged, the two ends of the wire are to be drawn tightly, and slipped between the inner sides of the clamp, which is affixed to the upper extremity of the outer blade of the scissors portion of the snare.

The inner surfaces of the two blades of the clamp being serrated, when the wire is slipped between them it will be held firmly by a tightening of the thumb-screw.

The operation is completed by forcibly compressing the handles of the scissors held firmly in the hand. The wire is kept from slipping back during the operation by means of a rod, which is notched, and attached to one blade of the scissors, and held in position by a spring as it slides through the opposite handle. Should the operation be not completed when the handles of the scissors have been tightly closed, the wires are to be released from the clamp, the instrument opened, and the above procedure repeated, the little screw located on the top of the canula holding the wire in position during the readjustment.

It will seldom happen that a rearrangement of the wire is necessary, the play of the instrument being sufficient to allow of the severance of an exceedingly large growth.

The principal features that would seem to recommend this form of nasal snare are: that it can be manipulated with one hand; that its peculiar construction admits of the use of a great amount of force; that the wire can be speedily secured and without twisting; and that the size of the loop can be increased or diminished by simply opening or closing the scissors.

In the removal of nasal tumors with the snare, the mass should always be removed by a gradual tightening of the wire.

The operation of tearing off the growth after it has been tightly encircled, which is advocated by some surgeons, should never be performed. It is not only very painful, but the hemorrhage, which is inconsiderable in the gradual method, is generally very abundant.

When the growths are located in the anterior portions of the fossæ, their removal is extremely easy. A loop of wire sufficient to admit of easy introduction into the anterior nares is exposed from the end of the canula, and being slightly inclined towards the outer wall of the cavity, is slowly introduced, pushed gently backwards, and pressed firmly against the body of the polypus. In the majority of cases, on account of the peculiar structure of the gelatinous growth, its body will be forced through the loop by this procedure and its neck speedily encircled.

Should the tumor be of considerable size, an en-

largement of the loop after it has been passed into the nasal cavity will be necessary before an engagement can be accomplished.

Many surgeons hold that in the removal of nasal tumors by means of the snare, a considerable amount of time should be consumed, a rest being taken between each two or three turns of the screw. My experience leads me to advise that when once the tumor has been secured, the operation be completed as speedily as possible. There is very little more danger of bleeding from rapid cutting than from the prolonged method; and the former operation has one great argument in its favor: it shortens the duration of the pain, which is always, especially in the harder types of tumors, a concomitant symptom. Too much must not be expected of cocaine in these operations, on account of the difficulty of applying it deeply enough to reach the tissues to be severed.

The removal of polypi located in the posterior nasal cavity is a much more difficult operation than that above described.

The greater majority of these tumors can be removed by the introduction of the instrument through the anterior nares, the snaring process being accomplished through the agency of posterior rhinoscopy. In those cases in which it is necessary to operate through the mouth, a properly curved canula should replace the straight one. In snaring post-nasal tumors, the location of the growth, more especially

as to its attachment, will suggest the manipulation necessary to encircle it. A plan, which will frequently be followed by success, is to enlarge the loop greatly, and turn it around as far as possible by revolving the instrument. A pulling forward of the velum by pieces of tape or string passed through the nostrils and tied around the ears, or over the upper lip, will greatly facilitate the manipulations.

After the cavities have been cleared of polypi, some form of treatment is called for to prevent their reappearance.

For this purpose we have a choice of two operations: the destruction of the tissues from which the tumors have been severed with acid applications, or the burning of these parts with the galvano-cautery. For the same reasons advanced when treating of this subject in Chapter VII., actual cauterization should always be preferred.

The employment of the cautery snare (Fig. 25) for the removal of polypoid tumors is a highly satisfactory operation in skilled hands.

The only difference between this operation and that of cold snaring is, that while the loop is being tightened, the platinum wire is allowed to be heated, the tumor being cut off and cauterized at the same time.

FIBROUS TUMORS.

Fibrous tumors of the nose are much less frequently met with than the gelatinous type, and

are more often found in the posterior nasal cavity, their favorite site being the vault of the pharynx.

They spring from the periosteum, are chiefly composed of fibrous matter, and are generally outgrowths of either the occipital or sphenoid bones. At first their growth is very slow, but later on their development becomes much accelerated, and, if not removed, may fill up the entire posterior nasal cavities and invade the neighboring structures.

Rhinoscopic Examination. — Fibromata present many distinctive features, and should be readily diagnosed from the gelatinous tumor.

Their color is of a darkish-red, and they are opaque, the translucency so marked in the soft variety being absent. Being made up principally of fibroid tissue, they are hard to the touch, resisting indentation. They are likewise symmetrical, and have a broad attachment, the pendulous appearance so characteristic of the gelatinous polyp being wanting.

Symptomatology.—As with myxomata, the principal symptoms are due to nasal obstruction, and are more or less pronounced according to the size and location of the growth. When the tumor is sufficiently large to produce entire occlusion, the sufferings of the patient are great, all the neighboring structures contributing to the general discomfort through interference with their functions. Marked deafness, profuse lachrymation, frontal headache, and pharyngeal catarrh are generally prominent

symptoms. If the neighboring structures have been invaded by the growing tumor, a peculiar prominence on either side of the nose, which has been called "frog-face," is frequently seen.

Therapeutics.—The removal of fibromata, prior to their encroachment upon the structures in the immediate vicinity of the nose, can best be accomplished by means of the nasal snare. Evulsion with the polypus forceps is not only highly unsatisfactory, but also somewhat dangerous on account of hemorrhage.

When the fibroid growth is small, cold snaring will be by far the better plan of operation in the majority of hands. When, however, the tumor is of large dimensions, the galvano-cautery method, when used by the expert surgeon, is decidedly to be preferred. The danger of hemorrhage, which is oftentimes profuse in large fibroid growths, on account of the size of the severed vessels, is reduced to a minimum when this method is employed, cauterization coagulating the escaping blood, and thus stopping the sanguineous flow.

When the tumor has grown to such a size that removal through the nares is impossible, access must be gained to the nasal cavities through some form of cutting operation from without.

CARTILAGINOUS TUMORS.

Enchondromata or cartilaginous tumors are sometimes found in the anterior nares, and generally spring from the septum. They have a broad base,

are exceedingly slow in their development, and are an outgrowth of the perichondrium. They usually attain a size sufficient to impinge upon the bony structures opposite and then cease to grow.

Rhinoscopic Examination.—Upon inspection, enchondromata look not unlike angular deviations of the septum. The differential diagnosis between these two affections can always be easily made by an inspection of the opposite side, when in cases of deflection the corresponding depression will always be observed. When the cartilaginous tumor is of large dimensions, and presses against the opposite tissues, erosions of the impinging membrane are generally noticed.

Symptomatology.—The principal symptoms experienced by the patient are due to the blocking up of the fossæ. Nasal respiration is more or less impeded, and the voice, both in singing and speaking, is compromised.

When the tumor is large, and the opposite structures are impinged, periodical attacks of slight bleeding and pain from pressure are added to the above symptoms.

Frontal headache and orbital irritation are likewise frequently complained of.

Therapeutics.—Cartilaginous tumors of the septum, being generally freely accessible, can be readily removed with an ordinary probe-pointed bistoury. An

easy method of removing them will be found in snipping off the exuberant mass by means of the cutting forceps described in the last chapter. When located too high to be satisfactorily reached with the knife or forceps, they may be encircled with the galvano-cautery snare and cleanly removed.

BONY GROWTHS.

Exostoses or bony growths are not so frequently met with as enchondromata. They may spring from any portion of the walls of the fossæ; the septum, however, being their favorite site. They are likewise composed of very hard tissue, and, as with the cartilaginous variety, are outgrowths of the periosteum.

Rhinoscopic Examination.—Upon inspection they present a rounded appearance, the external surface is of a lighter color than the surrounding tissues. Upon pressure being made with the probe, their peculiar marble-like hardness manifests itself, indentation being an impossibility. When they are large enough to press against the turbinated bone, ulceration will be a prominent feature. A slight bony union between the impinging structures will also be frequently noticed.

Symptomatology.—All the symptoms tabulated above with reference to cartilaginous tumors are liable to present themselves in the variety of growths under consideration. Thus we may have

stenosis on the affected side, vocal impairments, headache, lachrymation, and tensile pain.

Therapeutics.—The removal of bony tumors may be effected by either one of two operations—the sawing off of the osseous mass, or the gradual shaving of its external surface by means of the dental or electrical engine (Chapter VII.).

When the tumor is small, the latter operation is to be preferred. When the proper burr is selected, and the case selected is a proper one for the operation, the exuberant tissues can be shaved off with great nicety by means of the surgical engine.

An excellent instrument when attached to the surgical engine will be found in the nasal saw.

This instrument is cleanly in its action, combining the rapidity of the burr with the efficiency of the saw.

When, however, the tumor is large, with a broad base and an angular apex, the nasal saw will be the better instrument for its extirpation. The little saw described in Chapter VII. will be found an efficient instrument for the performance of this operation. Its teeth are very fine and penetrating, thus enabling the surgeon to obtain a quicker grip upon the osseous mass. In the sawing operation, too, but a single sitting will be necessary, the tumor being removed in a few seconds, while in the method in which the surgical engine is used, several sittings will be necessary for the shaving off of the mass.

MALIGNANT TUMORS.

Tumors of rapid growth, malignant in their course, occasionally form in the nasal fossæ.

Of this variety of tumors the epitheliomata are most frequently met with. They grow rapidly and with great expansion of the long walls of the fossæ, and soon invade the neighboring structures.

Rhinoscopic Examination.—If observed early in its growth, epithelioma will present itself as a small, soft, elastic tumor, highly inflamed, and exceedingly liable to bleed when probed. The above symptoms, coupled with its speedy development and rapid encroachment upon the neighboring structures, should always lead the surgeon to suspect its cancerous nature.

Symptomatology.—Severe pain of a tensile nature, together with frequent hemorrhages, are the most prominent symptoms. Later on, when in the progress of the disease the neighboring structures are invaded, the sufferings of the patient are intense. The eyes are bulging, frontal headache is severe and paroxysmal, and neuralgic pain unbearable.

Therapeutics.—The nature of the tumor being malignant and progressive, nothing of a permanent nature can be accomplished by operation, unless it be observed early in its growth, and its origin be within reach. The galvano-cautery would then offer the only safe method by which the cancerous mass

could be removed. If the case be one in which operation has been successfully resorted to, it should be kept under observation for a long time, and galvano-caustic applied at the slightest trace of renewal. Treatment other than of a surgical nature should be resorted to for the removal of the pain and the counteraction of the local inflammatory symptoms.

CHAPTER XV.

EPISTAXIS.

OWING to the great vascularity of the nasal mucous membrane and to the exposed position of the nose, epistaxis is of frequent occurrence.

Etiology.—Idiopathic epistaxis is very common in children, and young people about the age of puberty, more particularly in girls antecedently to the menstrual period. In the adult it is more serious, and may be associated with a state of plethora with tendency to cerebral congestion. When epistaxis occurs as a relief to vascular turgescence within the cranium, it is preceded by violent cephalalgia, noises in the ears, vertigo, sleeplessness, and dryness and heat in the nasal passages.

When occurring frequently, without apparent cause, especially if the blood is thin, copious in quantity, and difficult to restrain, it is an evidence of the hemorrhagic diathesis. This form appears most frequently in boys anterior to or just about the period of puberty.

Bleeding from the nose is a frequent attendant to,

and often a diagnostic symptom of, certain diseases, more particularly typhoid fever, remittent fever, scurvy, diphtheria, and the exanthemata.

Hemorrhage from the nose has often been known to occur from diminution of atmospheric pressure in ascending lofty mountains. It is likewise a frequent concomitant to rhinitic inflammations, particularly when ulceration of the mucous membrane is present. In the several forms of nasal tumors, described in the preceding chapter, slight attacks of nose-bleed are frequently experienced. Violent blowing of the nose, prolonged paroxysms of sneezing, and constant picking are also common causes of epistaxis.

Symptomatology.—When nose-bleed occurs from cerebral congestion, the premonitory symptoms, such as headache, vertigo, tinnitus aurium, etc., will disappear when the flow of blood has become established. This fact, together with the age and condition of the patient, should always suspicion the cause. When bleeding occurs in young children and it is not induced by local cause, the hemorrhagic diathesis should always be suspected and the blood be examined microscopically. In cases of young females, when the hemorrhage is of a periodical nature and the uterine flow is absent or scanty, the trouble should be ascribed to vicarious menstruation. Epistaxis is usually confined to one nostril, a hemorrhage from both being uncommon. As a usual thing it is not very profuse, and soon ceases

spontaneously. On the contrary, however, it may last for hours or days, and may at once, from its copiousness, or gradually, from its continuance, induce fainting, or even terminate fatally.

In cases in which the bleeding is due to slight ulceration, or to nasal tumors, except those of a malignant character, the hemorrhage is but slight, and usually consists of an occasional dripping.

Therapeutics.—Epistaxis being frequently a symptom of some constitutional condition, its treatment must be of a general as well as of a local nature.

When caused by an impoverished condition of the blood, as is frequently the case with young subjects, the internal administration of the salts of iron and the hypophosphites is to be recommended. When occurring prior to the establishment of the menstrual flow, or later on as a symptom of some condition which interrupts the periodical discharges, emmenagogues and local uterine treatment are called for.

When the bleeding is a symptom of cerebral congestion, large doses of the bromides, together with an absolute rest of the brain, will have a tendency to prevent its recurrence.

When the hemorrhage is so profuse as to threaten serious injury, it will be necessary to resort to mechanical means to restrain it.

When the flow of blood arises from the anterior portion of the fossæ, it can frequently be stopped by

firmly pressing the nostrils together, and raising both arms above the head, thus lessening the pressure upon the bleeding vessels. Cold, by means of ice-bags, or cloths saturated with iced water, should at the same time be applied to the nape of the neck and continued there for some time after the cessation of bleeding. If the above measures fail to restrain the hemorrhage, the local application of astringents should be resorted to, unless the flow of blood be alarming, when other and speedier methods must be employed. Tannic or gallic acid, either in the pure state or diluted one half with acaciæ, applied by means of insufflation, will be of especial service in controlling slight attacks.

If the flow of blood be copious, or, from its long continuance, the patient begins to exhibit symptoms of loss of blood, such as pallor, exhaustion, vertigo, weakened pulse, etc., packing of the anterior cavities, if they be the source of the trouble, should be immediately resorted to.

This operation is performed by tightly packing pledgets of cotton into the cavities by means of the nasal probe. The pledget of cotton should be previously dipped into some styptic solution, the solution of the subsulphate of iron being probably the best.

If the hemorrhage springs from the mucous membrane of the anterior nasal cavities, cotton tampons, if applied very tightly, will usually control it. But if, on the contrary, the ruptured vessels be located

in the posterior cavity, as will be evidenced by the blood flowing through the posterior nares into the mouth after the anterior packing, plugging of this

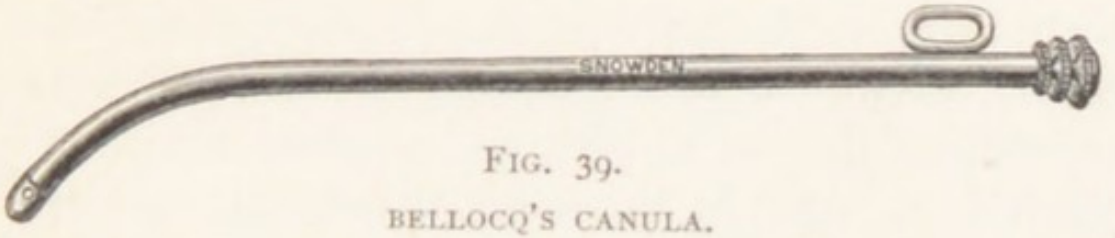

FIG. 39.

BELLOCQ'S CANULA.

cavity will be necessary. Plugging of the posterior nasal cavity is accomplished by passing a string, to which a pledget of lint or cotton is attached, through the nasal canal by the way of the posterior nares.

The instrument used for this purpose is called Bellocq's canula. It consists of a metal tube through which a curved wire passes. When the curved spring

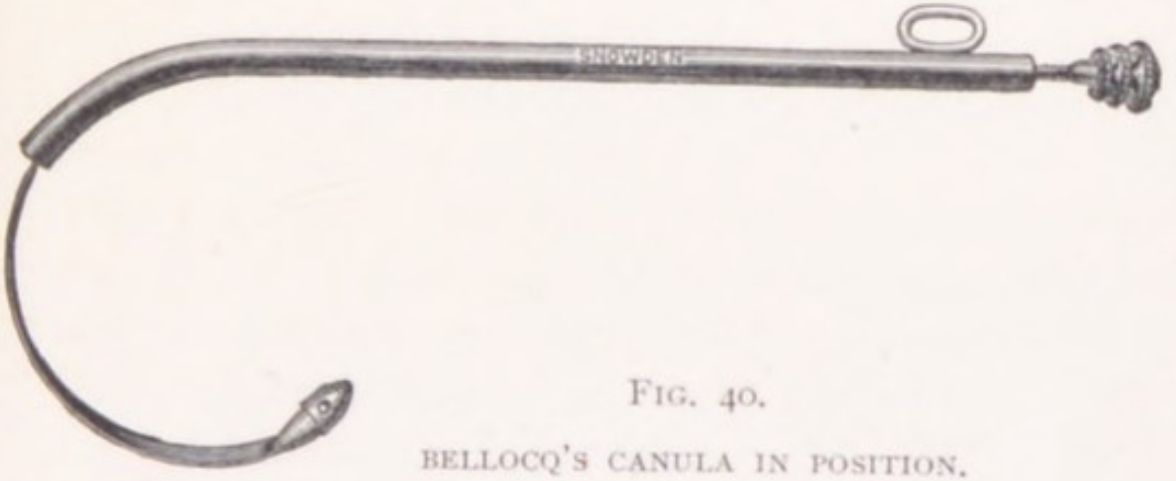

FIG. 40.

BELLOCQ'S CANULA IN POSITION.

passes into the mouth, the piece of string to which the tampon is attached is affixed to its extremity and drawn through the nostril.

In the preparation of the tampon, care must be taken to tie the pledget in such a manner that when *in situ* sufficient string will be left hanging from the mouth to admit of its being united with the end that protrudes from the nostril. Should the operator not possess the above instrument, an ordinary flexible urethral bougie will furnish an excellent substitute. The bougie is to be threaded, passed through the anterior nares into the mouth, when the string must be grasped and the instrument removed. The pledget of lint can then be tied on and be drawn into the posterior nasal cavity, its passage being aided by the hand of the operator.

CHAPTER XVI.

FOREIGN BODIES IN THE NOSE.

FOREIGN bodies in the nose, such as pebbles, beads, dried peas, etc., are occasionally met with in children, having been stuffed up in play, and becoming so firmly fixed as to require extraction by the surgeon.

Cases frequently present themselves in which the foreign body has remained impacted for years, causing an irritating and offensive discharge, which is credited to fetid catarrh. In this manner a calculus may be formed, the foreign body becoming encrusted with calcareous matter.

The principal symptoms of a foreign body in the nose are due to the obstruction of the fossæ and to the catarrhal inflammation excited by its presence.

The rhinoliths which are sometimes found in the nasal cavities may have their origin from foreign bodies which have been encrusted with the saline portions of the serum, secreted in consequence of the irritation they produce.

Treatment.—The removal of a foreign body from

the nose, if discovered shortly after its introduction, is an exceedingly simple operation. After, however, the substance has become imbedded in the tissues, and by the lapse of time become encrusted with calcareous matter, its extraction is generally a difficult feat.

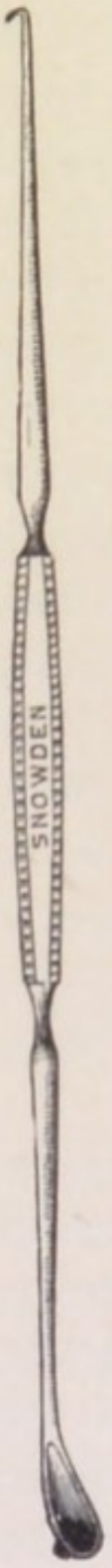

FIG. 41.
GROSS' CURETTE.

Forcible sneezing, the nasal douche, and the posterior nasal syringe, have been advocated for the removal of foreign bodies. Their use, however, offers very little hope for success in cases where the engaged substance has become impacted.

The only manner in which the body can then be removed is by passing a slender hook beyond it and prying it from its bed.

The little instrument designed by Dr. Gross for the removal of foreign bodies from the ear will be found just as efficacious in nasal surgery.

The attempt to extract these bodies with the nasal forceps will not only invariably be followed by failure, but will also often result in pushing the substance farther back in the fossa, and thus make its removal still more difficult.

Foreign bodies in the posterior nares are of extremely rare occurrence. I have met with but a single instance of this class of accidents, which, on account of its unique character, is presented in detail.

Mr. A., æt. 24, applied to me for treatment several years ago, with the following history: About three weeks prior to his visit, while holding a pin in his mouth, he was startled by a comrade striking him on the back with his hand. Immediately on receipt of the blow, the pin, which was held in position by the teeth, became dislodged, and slipped to the back of the throat. A violent fit of coughing ensued, and was protracted by the patient's endeavors to bring out the foreign substance; but all in vain. From the time of the accident, the patient said that he could distinctly feel the point of the pin sticking into him, but could not exactly locate the seat of pain. The physician whom he first consulted examined his mouth and throat as best he could without the aid of the laryngoscope, and also passed a bougie into the œsophagus,—hoping, no doubt, that if the pin was in this latter situation it would be pushed on into the stomach. This operation affording no relief, he consulted me, at the advice of a friend. Thorough examination of the fauces and larynx with the laryngoscope displayed not the slightest sign of the presence of a foreign body, the parts presenting everywhere a normal state. Ex-

ploration of the posterior nasal cavity was now determined upon, and this portion of the fossæ forthwith illuminated.

After one or two attempts at the introduction of the mouth-mirror were made, a perfect view of the cavity was obtained, and something was seen distinctly sticking between the turbinated bones and the septum, which was surmised to be the missing pin. By repeated examination, not only was the identity of the article established, but also its relative position.

The point of the pin was securely fixed and imbedded in the mucous membrane lining the middle meatus and the under surface of the middle turbinated bone, whilst its head rested against the septum nasi, forming with it a little less than a right angle. The mucous membrane in the immediate vicinity was greatly inflamed and swollen, and concealed about one third of the pin. Having thus located the position of the foreign body, its extraction was immediately determined upon, and an ordinary pair of post-nasal forceps (Fig. 33) selected for the operation. After the tongue had been depressed as much as possible, the forceps was carefully introduced, and the pin easily disengaged and removed after a few gentle manipulations.

The pin proved to be a fine one, and measured three quarters of an inch in length. On questioning the patient, it was learned that immediately after the

accident he tried to cough up the body, from which statement it was inferred that it had at first become lodged in the fauces, but had subsequently been displaced and sucked up by a current of air into the posterior nasal cavity.

THE END.

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