

EXPLANATION OF PLATE XLV.

FIGS. 1, 2, and 3.—Papillary Growths Removed from the Nasal Mucous Membrane by Means of the Wire Snare Heated to a Red Heat. They represent simple hypertrophies of the mucous membrane.

FIG. 4.—Ulcer on the Left Side of the Inferior Turbinate, the Nasal Mucous Membrane Everywhere Else Being Quite Healthy. Syphilis was the cause. Specific treatment was tried in vain. Healing finally took place under the influence of a long series of cauterizations and a paste containing resorcin.

FIG. 5.—Smooth Hypertrophy of the Lower Turbinate in a Woman Fifty-three Years of Age. The most marked pathological changes were in the inferior turbinate. The picture gives a faithful representation of a granular hypertrophy of the mucous membrane. Neither pressure with a probe nor the application of caustic caused the slightest degree of pain or a noticeable degree. Both sides were equally affected.

FIG. 6.—Papillary Hypertrophy of the Inferior Turbinate in the Case of a Woman, Sixty-five Years of Age. This case had suffered for many years from chronic rhinitis. Smooth hypertrophies of the inferior turbinate were present. The growths were of the papillary type. It is only after the case has been examined that one can be sure that it represents an altered state of the mucous membrane, and not a foreign body. After the operation the latter will sometimes be found to be of all kinds of shape and size. Note the vascularization of the growth.

FIG. 7.—Papillary Hypertrophy of the Inferior Turbinate in a Woman Forty-two Years of Age. This case is characterized by the fact that the growths are situated in front and above the inferior turbinate.

FIG. 8.—Papillary Hypertrophy of the Inferior Turbinate in a Woman Forty-two Years of Age. This case is characterized by the fact that the growths are situated in front and above the inferior turbinate.

FIG. 9.—Hypertrophy of the Lower Turbinate of the Nasal Vestibule on the Right Side, of a Papillary Nature on the Left and at the Inferior End of the Turbinate.

FIG. 10.—Papillary Hypertrophy of the Inferior Ends of the Lower Turbinates, of such Dimensions, on the Right Side, as Entirely to Cover up the Mouth of the Eustachian Tube and Close the Posterior Entrance of the Right Nasal Passage. On the left side the hypertrophy is less pronounced.

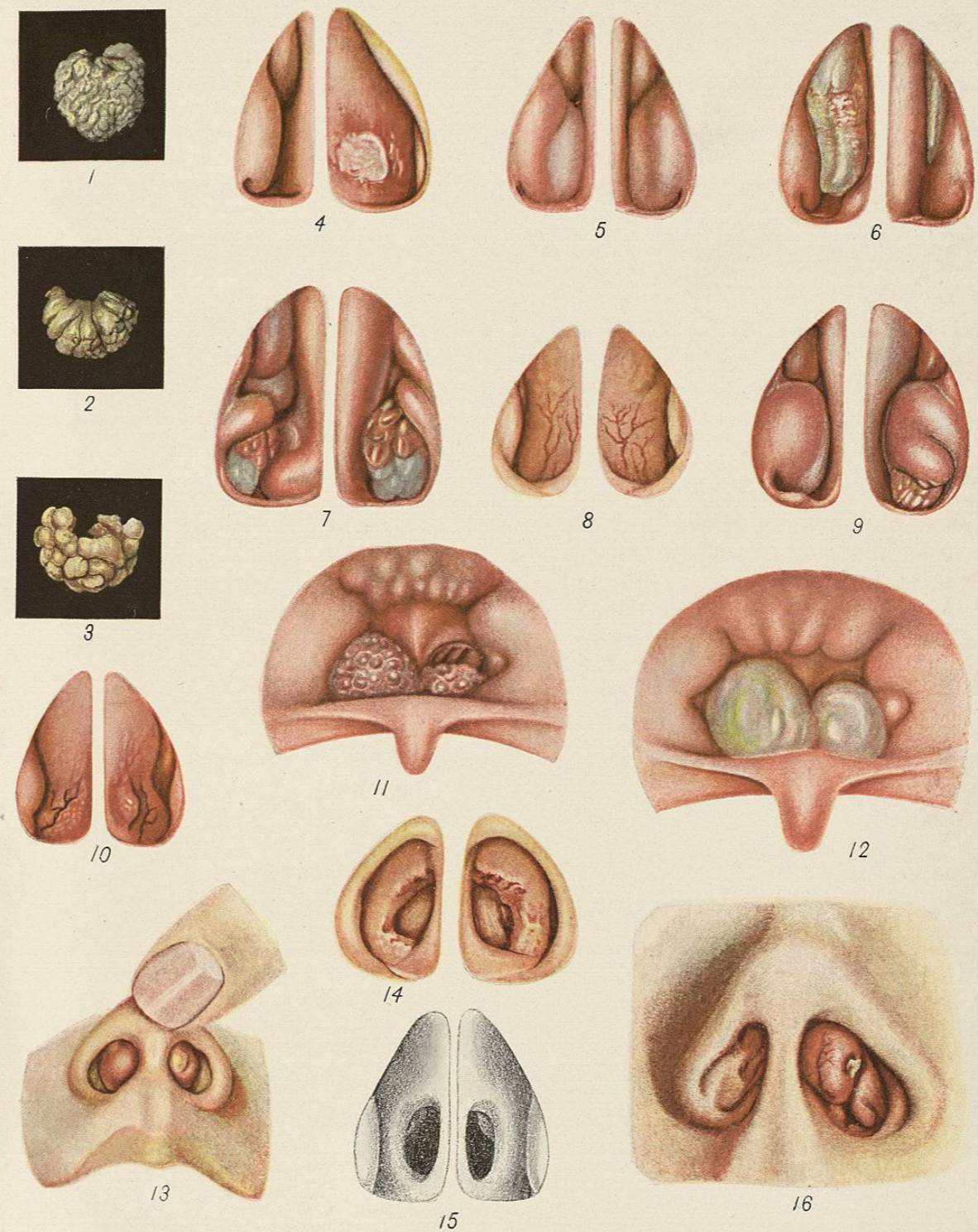
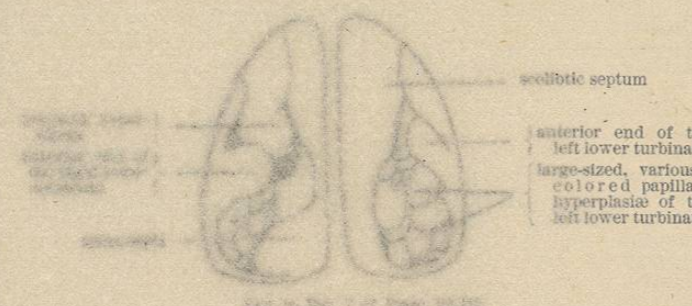
FIG. 11.—Polypoid Hypertrophy of the Posterior Ends of the Lower Turbinates. (Also remains of pharyngeal tonsil.) The patient was a young man, eighteen years of age. Although these polypoid masses are somewhat hummocked or knobbed, as they generally are, they should, in the present instance, still be classed as smooth hypertrophies.

FIG. 12.—Abscess of the Septum Narium, Probably of Traumatic Origin, in the Case of a Child Fifteen Months Old. On the left side there is a spot where softening has already taken place and where a spontaneous rupture is about to occur.

FIG. 13.—Perforation of the Septum Narium in the Cartilaginous Portion, Quite Far Forward. The margins of the opening still show irregularities on the surface and are everted. The nasal mucous membrane as a whole is pale and atrophic. On looking through the opening, either from the right side or from the left, one can see the surface of the opposite turbinate as far back as to its posterior end. The patient was a woman thirty-four years of age, and the cause of the defect was probably lupus.

FIG. 14.—Another Instance of Perforation of the Septum Narium in a Patient who Manifested No Other Evidences of Disease. The etiology in this case is unknown.

FIG. 15.—Abscess of the Septum, with Protrusion of the Overlying Mucous Membrane only on the Left Side. (Perforation occurred spontaneously.) The anterior end of the left lower turbinate is in an inflamed and swollen condition.



PATHOLOGICAL CONDITIONS OF THE NASAL MUCOUS MEMBRANE
(From the "Atlas der Krankheiten der Nase," by Dr. P. H. Gerber.)

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of steel wire, which is worn in the nose and gradually tightened from day to day; the adhesion is thus gradually cut through, and the parts heal as the section advances. Still others pass a silk thread loop through the centre of the adhesion, wait until the central opening has healed, and then cut from it—that is, they use the familiar method employed in separating the adhesions between webbed fingers from burns. Reunion is always prevented by the presence of the narrow strip of cicatricial tissue at the base of the cut. In the use of the knife to make the separation, care should be taken not to injure the tissue at its back. After healing is complete, the narrow band back of the original central perforation may be severed. In all these cases the systematic after-use of some form of dilator is for a while advisable.

VII. PERFORATIONS OF THE SEPTUM.—These may result from syphilis, typhus, typhoid, scarlet, and other fevers in which trophic disturbances lead to a local disorganization of tissue. Other causes are acute primary chondritis (rare), trauma (either accidental or surgical), pressure of tubes and splints, etc. A frequent variety of perforation is that following the lesion known as "simple perforating ulcer," which occurs in perfectly healthy persons without any dyscrasia. It is distinguished from tubercle and syphilis by the condition of its edges which are regularly smooth and healed, by the absence of accompanying lesions on the outer walls of the nose, and especially from syphilis by the fact that the latter shows a selective affinity for the bony structures, while the simple perforating ulcer is strictly confined to the cartilage. In the latter, four stages present themselves: (1) injury or long-continued irritation, as from picking the nose to remove the crusts that frequently form at this site; (2) hemorrhage into the mucosa (the xanthosis of Zuckerkandl); (3) erosion of the capillaries with consequent impairment of nutrition; and (4) partial atrophy leading to perforation or not, according to the presence or absence of infection. The exposed site of the ulcer regularly leads, however, to infection. After the perforation has taken place we find, as noted, a rounded or oval fenestra in the septum with smooth edges. It occupies the area known as the "locus Kiesselbachii." There is no specific bacteriology of the affection, the ordinary staphylococci and streptococci being found. While forming, the ulcer appears as a truncated cone with the base superficial. The area becomes macerated by the nasal secretions, and there is really a necrobiosis of the mucosa. The tissue loss is also favored by the fact that at this site the mucosa is unusually thin, and contains a small congeries of rather large vessels. Symptoms are wanting after the edges have healed. Many cases come under observation only on systematic examination, having given no symptoms whatever. (See Plate XLV., Figs. 14 and 15.)

Treatment calls for measures to combat any existing dyscrasia. If the edges are raw, a fifty-per-cent. solution of silver nitrate may be applied; later, we may use iodine gr. v., iodide of potassium gr. x., in half an ounce of glycerin.

VIII. OUTGROWTHS FROM THE SEPTUM.—These may appear as crests, spurs, ridges, or rounded masses on any portion of the septum. A favorite area is along the lines of junction of its various bony and cartilaginous components. Some of these excrescences are little more than thickenings of the mucosa, and if their removal be deemed necessary, it can be effected with the galvanocautery. Reaction following the application of this agent to cartilage is often severe and it must be used with caution. If the outgrowths contain cartilage we may employ knives, scissors, gouges, draw-shaves, and electrolysis; if they contain bone salts or true bone, we may use trephines, saws, or chisels.

Previous to all such manipulations the nose should be carefully cleansed with some disinfecting agent and then cocaine and adrenalin applied. Most of these operations can be done under local anesthesia. After-packing is best omitted. If the wound is smooth and respiration can be carried on through the affected side, bleeding will

quickly cease. Packing causes retention of secretion with liability to infection. So also antiseptic powders should not be so freely employed as to form a crust in the nose. The patient must keep quiet for a time and wear just inside the vestibule a loose plug of cotton to strain out the dust from the inspired air. He must keep his fingers out of his nose and be taught the proper method of blowing the organ when using cleansing washes.

IX. DEVIATIONS OF THE SEPTUM.—The causes of this condition may be trauma, the long continuance of turbinal abnormalities, or a faster growth of the cartilaginous septum than of its bony frame. It is not always easy to establish the history of trauma, for it may refer back to any one of the numerous falls of childhood. Many of these, regarded at the time as trivial, may be the starting-point of hypernutrition with consequent deviation. It is impossible to make any classification of deviations that is entirely satisfactory. They may involve the bone or cartilage, and may be vertical, horizontal, or both. They are generally associated with some local outgrowth.

The symptoms are those of nasal obstruction with its effects upon both neighboring and distant organs. Many minor degrees of deviation give no symptoms and require no treatment.

The number of operations devised for the correction of deviated septa is legion. Only a few of the more useful ones can here be mentioned.

The Asch Operation.—This is done under general anesthesia. Nitrous oxide is an ideal agent. Previous to the administration of the anæsthetic, adrenalin solution should be applied to both sides of the septum. If any adhesions exist between the septum and turbinates, they are broken up by means of the gouges belonging to the special set of instruments devised for this operation. The blunt blade of the scissors is inserted into the obstructed nostril and the cutting blade into the other. A crucial incision is then made, the scissors being withdrawn for the change of position in the second cut; this latter crossing the first as nearly as possible at right angles at the point of greatest convexity. The forefinger is then inserted into the obstructed nostril; the segments made by the incisions are pushed into the opposite nostril and the pressure is continued until they are thoroughly broken at their base and the resiliency of the septum is destroyed. *On this point depends the success of the operation; for unless the fracture of these segments is assured, the resiliency of the cartilage will not be overcome and the operation will fail.* The septum is then to be straightened with the flat-bladed forceps. The little blood there may be in the nostrils is wiped out with a cotton pledget and a flattened hard-rubber or block-tin splint is inserted in each nostril. These act as supports for the septum and tend to prevent secondary hemorrhage. The patient should be kept in bed for two or three days, ice cloths being applied over the nose if there is swelling or pain. The nares should be sprayed through the tubes with some antiseptic. Twenty-four hours after the operation the tube on the previously patent side is removed and not replaced. The nostril is cleansed and an antiseptic powder insufflated. It is well to protect the naris with a loose pledget of cotton when in the open air. The tube on the previously occluded side may remain *in situ* for another twenty-four hours, when it is to be withdrawn, the nostril cleansed, and the tube replaced. It is a splint for the septum and may be withdrawn daily for a week, then on alternate days, and gradually at lengthening intervals until healing is complete. If the case can be seen daily, the tube can probably be removed at the end of from two to three weeks. It must be of such a size that it can be easily reinserted without pressure, else it will be crowded out by the tissues behind and the operation will be at best but partially successful. It is completely hidden by the alæ, and if well fitting causes no discomfort to the patient. Subsequently to its permanent removal small bits of granulation tissue may require cauterization or removal with forceps in order that an entirely smooth surface may be

left. Care should also be taken so to make the incisions that the tube will rest on the floor of the nose.

The Watson Operation.—This is especially applicable to those cases in which the deviation is marked and low down, so that it is impossible to bring the lower fragment into line. Instead of cutting out an elliptical piece along the horizontal line, as is recommended by some authors, Watson makes a bevelled incision, the edge of the knife being directed upward and toward the opposite side, and carried through the cartilage but not the mucosa of the opposite side. The incision is made on the crest of the deviation. If a vertical deviation exists at the same time, a triangular-shaped portion with the apex uppermost may be removed. The upper portion in the horizontal incision is pressed over toward the other side, where it hooks on to the lower and is thus held in place. The projecting base can afterward be removed.

The Gleason Operation.—The field of operation is cocaineized and exposed by a self-retaining nasal speculum. A thin saw is introduced along the floor of the septum beneath the deviation. The sawing is continued in a horizontal direction until the blade has penetrated somewhat deeply into the tissues, when the direction is rapidly changed to one nearly vertical. It is of the utmost importance that the blade be now held exactly parallel to the septum in order that the cut shall be around and not through any part of the deviation. The length of the vertical crura is then quickly increased by means of a small bistoury curved on its flat, and the flap is thrust through the hole in the septum by means of the forefinger.

While the finger is still in the nares, it is carried up along the anterior and posterior crura in order to make certain that the edge of the flap has completely cleared them, and the neck of the flap is then sharply bent. It is not necessary to denude the edges that are in contact. The pressure results in necrosis (at least of the superficial epithelial layer) of the mucosa, after which the parts unite. The special claim made for this operation is that it destroys the resiliency of the flap (a condition of success in any operation) at its neck. It is at this point, and practically at this alone, that resiliency is active—*i. e.*, at the neck of a comparatively long, narrow flap—and hence has a powerful leverage to overcome before it can thrust the inferior edge of the flap back through the septum. The neck should be bent to nearly a right angle.

The Pin Operation.—This operation, devised by Roberts, is performed by making an incision through the most prominent portion of the convexity, breaking up the resiliency with a stellate punch, and introducing a steel pin through the more open nostril, thrusting its point through the anterior part of the septum, forcing the curved portion of the latter into proper position, and then burying the point of the pin in the posterior part of the septum on the previously occluded side. The head of the pin should be covered with some smooth material to prevent irritation of the columella.

Ingals' Operation.—In cases in which the cartilage is bent almost at right angles across the nostrils, Ingals dissects up the mucosa, removes a triangular piece of cartilage of sufficient size, incises the latter farther back at its upper or lower part to destroy its resiliency, and maintains the septum in place by a plug in the occluded nares.

Roe's Operation.—Roe has devised an operation applicable to either bony or cartilaginous deviations. He insists upon the necessity, even if the deviation be confined to the cartilage alone, of fracturing the bone at or adjacent to the attachment of the cartilage. The change in direction of the latter attachment tends to hold the cartilage in its new position. Roe's operation requires a special fenestrated forceps, one blade of which is an ovate ring while the other—long, narrow, and rounded—fits loosely into it, so as not to injure the septum. The length of the handle prevents compression of the anterior portions of the septum. The male blade is introduced on the convex, and the female blade on the concave side of the deviation. The closure of the blades

crowds the deflected portion of the septum into and partly through the opening, indenting and fracturing it without affecting the surrounding area. The septum is held in its new position by a plug of metal wrapped with sterilized cotton or gauze. It is placed on the originally convex side and fills the nares.

Moure's Operation.—Moure, of Bordeaux, has devised an operation which he regards as an improvement on that of Asch. Spurs and thickenings are first removed with a special instrument consisting of an elongated ring with cutting edges on its elliptical extremity. These blades are concave externally and convex on the opposite side. Bleeding is checked by the cautery. Luxations of the antero-inferior part of the septum are resected with a knife, the mucosa being sutured. After full healing has occurred, the septum is attacked. Under cocaine an incision, 2 or 3 cm. long, is made close to and parallel with the nasal floor, special scissors resembling those of Asch being employed for the purpose. A second incision is then made at an acute angle to the first and near the front of the nose. There results a movable fragment held in front by the anterior part of the base of the septum, which has been left untouched toward the tip of the nose, and behind by the perpendicular plate of the ethmoid and the vomer. The next step consists in the introduction, on the side of the deviation, of a tubular dilator formed out of the parallel blades, the outer one being rigid and the inner one malleable. The inner one is modelled to the septum by forceps introduced with a dilator. The dilator is left *in situ* for eight days, the parts being kept meanwhile scrupulously clean.

All these operations have been variously modified by surgeons according to the requirements of individual cases. The main points to bear in mind are: (1) To remove all excess of tissue before attempting to straighten the septum; (2) to weaken the support of the latter by incision, fracture, etc., making sure to destroy the resiliency of the parts so that the septum will remain in its new position; and (3) to hold it there by some form of splint until healing has occurred in the new position. Scrupulous post-operative care, frequent changing of the plugs or splints, etc., so as to avoid retention of nasal secretions, are very important factors in the attainment of a successful result.

James E. Newcomb.

NASAL CAVITIES, DISEASES OF: FOREIGN BODIES. See *Air Passages, etc.*

NASAL CAVITIES, DISEASES OF: GLANDERS.—(Synonyms: Malleus, Farcy, Equinia.) Glanders is a contagious disease contracted from the horse and characterized by the formation of nodules, which soon become pustular and ulcerated, with symptoms of septicæmia and thick muco-purulent or sanious offensive discharge from the nose. It would not deserve space in this place were it not that from its rarity we are especially in need of an accurate account of its symptoms and signs, because personal experience is generally wanting. Although the disease is generally contracted from the horse, it must be understood that it also affects mules, donkeys, goats, cats, dogs, sheep, and pigs.

ANATOMICAL AND PATHOLOGICAL CHARACTERISTICS.—In men the disease is characterized by irregular and sometimes very extensive ulcers in the nose, especially if it has been of long duration. As the ulcers expose the cartilage and bone, these tissues become necrosed, and thus the entire septum and hard palate may be destroyed. Ulceration sometimes extends to the frontal sinus, pharynx, larynx, trachea, and bronchi. Edema of the larynx may result from the inflammatory changes. Microscopically, the tubercle or nodule of glanders differs from that of tuberculosis, in that it is vascular, has no giant cells, and breaks down by suppuration instead of undergoing cheesy degeneration. At the autopsy conditions are generally found which closely resemble those of pyæmia.

ETIOLOGY.—The affection is contracted from the horse or other animals and is caused by the bacillus mallei.

SYMPTOMATOLOGY.—The disease may be either acute or

chronic. The chronic affection runs from four to eight months, but the acute generally terminates within three weeks. The stage of incubation is from three to five days. After this period an inflammatory reaction takes place at the site of inoculation, which may be progressive and lead to abscess formation or may retrograde. Later, there are symptoms of general infection, malaise, headache, pains in the joints and muscles, and high fever, often attended by an erysipelatous rash of the nose and throat, which is soon followed by vesicles that burst and discharge a thin serous fluid. The disease may affect various parts of the body, but its most marked manifestations are in the nose and throat. The discharge from these parts is always extremely offensive and usually thin and profuse at first, but later thick and glutinous and sometimes streaked with blood. The voice commonly becomes husky or it may be lost, and cough and dyspnoea may develop. The chronic form is ushered in by a chronic nasal discharge, which may be so scanty that it merely forms crusts, or it may be quite profuse and purulent; or as the result of ulceration the discharges may be yellowish, brownish, or bloody. Upon inspection small ulcers are often found situated beneath the crusts, and sometimes characteristic nodules of a whitish color are seen seated upon an inflamed mucosa. These nodules soon break down in the centre, making small ulcers which may extend and coalesce with others. In man the nodules are much less common than in the horse, and indeed they may be entirely wanting. As ulceration progresses, necrosis of bone and cartilage occurs, and the septum may be perforated. As the disease extends backward, ulcers and inflammatory infiltration appear on the posterior pharyngeal wall, in the mouth, and on the tongue. When the larynx is reached the voice becomes hoarse and breathing may be difficult. In the lungs glanders produces symptoms of bronchitis. The intestinal canal may also be invaded, as indicated by gastric disturbances with diarrhoea, and the disease also attacks the skin, causing multiple abscesses or ulcers.

DIAGNOSIS.—Glanders is to be distinguished from nasal syphilis and tuberculosis. Nasal tuberculosis is usually associated with tuberculosis at the apex of one lung; it is commonly much slower in its progress than glanders, and it cannot be traced to contact with the horse. Finding of the pathogenic bacilli in either case will make the diagnosis certain.

Syphilis frequently resembles glanders, but the constitutional symptoms are much less pronounced. The history is very different and the bacillus mallei cannot be detected in this disease. Notwithstanding this, however, most cases of glanders are ineffectually treated for syphilis for some time before the real nature of the ailment is discovered. The chronic disease may last for weeks or months, and whenever an obstinate nasal catarrh exists in people who are much occupied with horses, a careful examination for glanders must be made. If nodules and ulcers appear, together with abscesses and ulcerations of the skin, in stablemen and others having much to do with horses, the existence of glanders should be suspected and the pus carefully searched for the bacilli. In order to confirm the diagnosis it may be even necessary to inoculate a male guinea-pig, in which case the characteristic nodes appear in the testicles after three or four days. The inoculations are made into the peritoneal cavity.

PROGNOSIS.—The chronic disease runs its course in from four to eight months and terminates fatally in at least ninety-five per cent. of the cases. The acute affection often is superadded to the chronic disease, and when this occurs death invariably results in from six to eight days, but primary acute disease usually lasts for about three weeks. As the disease progresses, the patient passes into a typhoid condition which, in the acute form, soon terminates in coma and death.

TREATMENT.—Prophylaxis is of the greatest importance, and those working about horses should be able to recognize the disease promptly, but the insidious course of chronic glanders in the horse may make the diagnosis

very difficult for a long time. In all such instances the services of a veterinarian should be employed. Little can be hoped for from the treatment of the disease, but locally strong solutions of creosote, tincture of iodine, nitrate of silver, and carbolic acid have been recommended, and it is claimed that recovery has in some cases followed the use of mercurial ointment. General supporting remedies are of course indicated. The secretions and discharge coming from the nose of a patient suffering from glanders should be carefully disinfected.

E. Fletcher Ingals.

NASAL CAVITIES, DISEASES OF: HEMORRHAGE.

—The term epistaxis is applied to bleeding from the nasal cavities and adjacent sinuses. Owing to the unusual vascularity of the nasal region, the delicacy of its construction, and its liability to accident, nosebleed is of very common occurrence.

ETIOLOGY.—It may be due to traumatism; to local affections of the nasal cavities, such as hyperæmia, dilatation of superficial blood-vessels, superficial erosions of the mucous membrane, ulceration; to the presence of foreign bodies or of pharyngeal adenoids; to various systemic affections such as anæmia, purpura, and scurvy; to diseased conditions of the brain, heart, liver, or kidneys; to typhoid and typhus fever, measles, scarlatina, diphtheria, pneumonia, etc.; it may be vicarious, occurring in women at the menstrual period; or, finally, it may arise from a variety of other causes dependent upon severe excitation of the circulation or irritation of the surface of the nasal mucous membrane.

It may occur as a result of toxic doses of certain drugs which are eliminated through the mucous surface of the upper air passages. It is present in fractures of the skull, especially at the base, and is also found with necrosis or caries of the bony skeleton of the nose. It has been caused in gunners by the severe concussion of heavy firing. It occasionally follows coitus. Sudden transition from a normal into a rarefied atmosphere may cause it. It is not infrequently the precursor of cerebral apoplexy. It is commonly met with in boys at the age of puberty, and in girls it may precede the establishment of the catamenia. It may occur in women during pregnancy and at the menopause. It is common in childhood, less so in middle life, and again more apt to occur with advancing age.

The bleeding may come from one or both nostrils. Originating from the deeper part of one nasal cavity the blood may be deflected into the nasal cavity of the opposite side, and escape outwardly through that nostril or into the pharynx. Dangerous nasal hemorrhage may occur during sleep, the blood being swallowed without attracting the attention of the patient. Serious loss of blood may thus result. The presence of bleeding in such a case would probably be demonstrated by changing the position of the patient and causing him to clear his throat.

Bleeding most frequently originates from the anterior and inferior part of the nasal septum, and when it comes from this locality it is seldom dangerous, although in some rare cases it may be severe and through frequent recurrence it may cause serious anæmia.

The bleeding point may be located in any part of the nasal cavity, or there may be a general oozing, widely diffused over the surface of the membrane, as in hæmophilia, purpura, and the anæmia of children. When coming from the anterior portion of the nares the blood escapes from the nostrils, but when from the deeper parts of the nasal cavities it may pass backward and be swallowed and later vomited, or it may pass into the trachea and be coughed up. The latter accident is not common. When the bleeding is from the upper and anterior part of the nasal cavity the hemorrhage may be serious. This is explained by the close connection between the anterior ethmoidal vessels and the intracranial circulation.

Plethora, especially when accompanied by deficient menstruation, portal congestion, and some forms of Bright's disease, may be relieved by epistaxis.