MORGAN, (E. C.)

Ozæna.

be of good size, since the gas, when once it begins to disengage, comes over in great volume. For the same reason the heat should be carefully watched and regulated during the operation, to avoid too furious action. For each litre (about one quart) of oxygen required, 3.46 Gm. (about fifty-three and a half grains) of potassic chlorate will be needed. The salt must be well powdered, and mixed with one-eighth of its weight, or thereabouts, of powdered and pure black oxide of manganese.

Edward Curtis.

OZÆNA, from ὄζειν, to stink, or ὀζαινα, a fish possessing a fetid odor. Synonyms: Fetid Catarrh, Scrofulous Ozæna, Fetid Coryza, Strumous Catarrh, Stinknase (Ger.), Punaisie (Fr.), Fœtor Narium, and Dysodia Narium (Lat.).

Definition.—By true or simple ozæna (rhinitis chronica atrophicans fœtida), names preferred by the writer, is meant an affection limited to the nares, in which there is no ulceration or diseased bone, the fetid odor depending on changes in the retained secretions.

The disease, of course, may be modified by diathesis, but is not dependent thereon.

Preliminary Remarks.—The above names are applied to a condition of the nares in which a stinking, and, to some extent, characteristic odor is exhaled. This odor is *sui generis*, but has been improperly likened to the peculiar smell of a mashed bedbug or chintz.

There exists considerable ambiguity concerning the application and exact significance of ozæna, and although originating in the earliest period of medicine the word has acquired a large and rather indefinite use, even in modern times.

Brochin prefers to describe the condition as an infirmity, not esteeming it a disease proper.

The term, when unqualified, is quite as indefinite and vague to a scientific mind as the generic expressions pain, fever, inflammation, or dropsy; all of which phenomena may owe their existence to diverse causes.

A mere stench exhaled from the nares may originate from disease of the accessory sinuses, from rhinoliths, from the presence of some external foreign body, from disease of the osseous or cartilaginous framework, from cancer, from lupus, from syphilis, and other causes, but the ozæna (stench) is symptomatic only of these disorders.

Until very recently any affection of the nasal passages in which the expired air was fetid was called ozæna; hence, diseases differing widely as to symptoms, course, and treatment were included under this rather broad category.

The writer fails to appreciate in what manner limiting the word ozæna to those fetid diseases of the accessory sinuses whose prominent symptoms are manifested in the nares, can lead to a simplification of the question.

The retention, then, of this word in medical nomenclature is unfortunate, and its use, except as hereafter to be indicated, calculated to promote confusion.

Ozæna is by no means to be classed as a separate and distinct disease, but rather as an attendant of several nasal affections, particularly atrophic rhinitis.

The writer further believes that ulceration of the nasal mucous membrane rarely, if ever, occurs in true ozæna, and he considers the retention and decomposition of nasal secretions an essential factor in the production of the stench accompanying the affection.

Clinically, he is satisfied that the fetidness of the odor is proportionate to the length of time the incrustations remain in the nasal cavities.

In the present contribution he will, so far as is consistent with fact, have respect for the above indicated propositions, which are briefly the expression of his individual views concerning this unsettled question.

Historical.—Well-nigh all ancient writers considered ozæna as associated with, and dependent upon, the presence of ulcers within the nares.

Celsus (40 B.C. to 20 A.D.) says, "The Greeks gave the name ozæna to nasal ulcers covered with crusts of a stinking odor."

Galen (second century) defines ozæna as "an ulceration in the depths of the nostrils causing a discharge and a bad odor."

Both Pliny (first century) and Ætius (fifth century) speak of the therapeutic management of ozæna, the latter recommending for its cure insufflations of various medicaments, and also the introduction of medicated pledgets within the nostrils.

The treatment instituted by Rufus (second century), Rhazes (ninth century), Avicenna (tenth century), Forestus (sixteenth century), and others, was, primarily, detergent, and, secondarily, directed to drying up the ulcers.

Actuarius (fourteenth century) seems not to have regarded ulceration as a constant accompaniment of ozæna, but calls especial attention to the odor emitted from decomposed nasal secretions.

Alexander Trallianus (sixth century) and Paré (sixteenth century) entertained essentially the opinions promulgated by Galen at an earlier period, while Fabricius ab Acquapendente (sixteenth century) and Thomas Mayern (seventeenth century) thought syphilis the leading *causa morbi*.

Reininger (1722) and Günz attributed ozæna to the putrefaction of secretions retained in the frontal, ethmoidal, sphenoidal, and maxillary sinuses, a theory which has been urged more recently by Michel and Rouge.

Sauvages (1771) was, I find, the first to insist upon the distinction of ozæna without lesion of the nares (simple, true, or idiopathic ozæna) from that attributable to lesions of the nasal mucosa, the nasal bones, and cartilages.

Valleix (1866) did not attribute ozæna to an ulceration of the Schneiderian membrane.

Cloquet (1830), Trousseau (1835), Cazenave (1835), and other older writers, have described the leading clinical features of ozæna with a clearness and scientific accuracy worthy of admiration.

Trousseau (1835), Max-Simon (1850), and Cousin (1868) divided the disease into symptomatic and constitutional ozæna.

In 1866 Otto Weber maintained that ozæna was simply a symptom and not a distinct disease, as many had hitherto claimed.

Niemeyer (1874) thinks there is an ulcerative and a non-ulcerative ozæna.

A very remarkable monograph has recently been published (1886) by W. Moldenhauer, in which the opinions and teachings of Gottstein, B. Fränkel, Bresgen, and others, are warmly assailed.

Moldenhauer himself, however, makes no attempt to explain the pathology of true ozæna, or to add another to the many theories already existing relative to this affection.

During the past six years interesting articles upon this disease have been written by Schrötter, Zaufal, Tillot, Zuckerkandl, Michel, B. Fränkel, Gottstein, Schäffer, Rouge, Cozzoline, Stoerk, Beverley Robinson, Martin, Bosworth, Franks, Krause, Massie, Calmettes, Moure, Ziem, Clinton Wagner, Woakes, Thornton, Morell Mackenzie, and others, reference to which is made in my bibliography of this subject at the end of the article.

Etiology.—True ozæna is usually associated with an atrophic rhinitis, and occurs most frequently prior to the age of thirty, and oftener in the female.

The disease is common in children, and sometimes exists in two or more members of the same family, but proof of its contagiousness is wanting.

Atrophic rhinitis with ozæna is, according to most authorities, generally due to the manifestations of the scrofulous or syphilitic diathesis upon the Schneiderian mucous membrane.

The nasal fossæ are richly supplied with glands and lined with tissues of a highly vascular and cavernous structure, thus offering the conditions necessary for the localization of either scrofula or syphilis therein.

The ozænic subject is one who usually suffers from a constitutional weakness, at times ill-defined, which may be occasioned by heredity (Fränkel, Zaufal, and Bresgen), by hereditary syphilis, by scrofula, or occur as a sequel of the eruptive fevers, particularly of scarlatina, measles, and small-pox.

We are struck with the similarity, as to age and general surroundings, of patients suffering with this disease; they are about the age of puberty, the youngest may be nine, the oldest is generally not over twenty years of age. Adults will invariably trace their disease back to early life.

The contour of the nose in children suffering with ozæna is frequently identical with that of their parents (father or mother) who have the same affection.

M. Mackenzie does not regard the disease as constitutional in the true sense of the word. He further says "that though scrofula probably produces a certain disposition to catarrh, and renders the affection more intractable when it does occur, it cannot, in my opinion, be said to cause ozæna."

Ziem and Schäffer claim that true ozæna may occur independently of atrophic rhinitis, and we all well know, on the other hand, that atrophic rhinitis is not invariably accompanied by ozæna.

Among Schäffer's 123 cases of ozæna, 99 were due to struma and 20 to syphilis.

Stoerk maintains that syphilis is the sole cause of ozæna.

Gottstein says that only two of his twelve cases of ozæna appeared to result from scrofula, and none was traceable to syphilis.

The existence of what may be denominated true ozæna, as distinguished from the symptomatic variety (dependent upon caries, necrosis, polypi, deformities, abscess of the accessory sinuses, etc.), appears to be established not only clinically, but anatomically and etiologically.

The rhinoscopic and post-mortem examinations made by Zaufal, Michel, Hartmann, Gottstein, and other German investigators, have rendered it quite evident that the peculiar fetid odor of true ozæna has no dependence upon the presence of ulceration in the nares; that when the adherent crusts are removed the pituitary membrane is seen to be less vascular than normal, smoother, slightly atrophied and inflamed, but above all intact.

The turbinated bodies do not present the characteristic erectile prominence; the inferior one is of diminutive size and is sometimes absent, giving to the nasal cavity enormous dimensions.

Chronic rhinitis, especially of the hypertrophic variety, predisposes to the development of atrophic rhinitis, and perhaps of a subsequent true ozæna.

The inhalation of dust and irritating gases, deviations of the vomer, and other conditions causing a chronic rhinitis, may result in ozæna.

The exceedingly disagreeable odor of ozæna is thought by a few authors to arise from individual idiosyncrasy, just as foul perspiration of the axillæ, groins, and feet is common to some individuals.

The penetrating perfume emitted from the body of the average negro is a striking instance of race idiosyncrasy, and exceeds in rare cases the nauseating exhalations of ozæna.

That the nasal mucous membrane in ozænic patients is endowed with the special function of exhaling or secreting foul odors, the writer does not believe.

Bosworth very aptly remarks in this connection that there is no analogy in the above comparisons, as the nasal mucous membrane is not an excretory organ.

It is the writer's opinion that the foul odor in true ozæna is dependent solely upon the presence of retained and decomposing secretions within the nares; and that if these secretions be removed and their further formation checked, all fetor disappears.

To the assertions that ozænic secretions contain a special ferment, and that ozæna is attributable to fatty metamorphosis, he attaches slight importance clinically.

Recently Loewenberg has added an interesting monograph to the already voluminous literature of this affection, and claims to have discovered a special microbe (always found as a diplococcus) for ozæna.

Around this microbe clusters much that is ingenious, theoretically, but the practical results of the alleged discovery as regards the cure of ozæna are as yet nil.

It has been stated that ozænic patients never suffer from hay fever; but the writer happens to know of one at least who does.

Anosmia, however, appears to afford complete immunity from hay fever, so far as is now known.*

Pathology.—The disease, as stated, commences generally in early life, and according to Bosworth "in an inflammation which is characterized by a desquamation of the epithelium lining of the acinous glands, which results in their destruction."

In some of Bosworth's specimens the glands had disappeared absolutely. The result of this is necessarily that the membrane is deprived of its normal supply of mucus. That which is secreted being scanty, very soon dries upon the surface of the membrane. There is thus formed a dry pellicle, which adheres closely, and is removed with difficulty. Remaining, it soon undergoes decomposition, and gives rise to fetor.

The pellicle of inspissated muco-pus which dries upon and adheres to the membrane, clinging about the convexity of the turbinated bones, and contracting and drying, necessarily exercises pressure and obstructs the circulation.

As a result of this, the atrophy of the membrane is still more encouraged. As we know, the deep layer of the mucous membrane in this region blends with, and really forms, the periosteum of the turbinated bones. We can easily see, therefore, how, as the result of the process continuing through years, there may occur the atrophy of the turbinated bone which characterizes the late stages of the disease, and which results from impaired nutrition.

Zuckerkandl, as quoted by M. Mackenzie, proves that not only the soft tissues, but also the bony structure of the turbinated bodies become thinner, more elastic, flatter, and smaller.

"The mucous membrane shrinks and becomes wrinkled, the erectile tissue disappears, and the thin, pale, shining mucosa looks more like serous than mucous membrane.

"When the morbid process is far advanced nothing is left but thin bands of mucous membrane, occasionally perhaps containing some small osseous fragments, the remains of the spongy bones."

Gottstein, as quoted by the same author "finds no defect other than a certain thinness of the mucous membrane in cases of ozæna. On microscopic investigation the epithelium was found to be normal; beneath this was a layer of small round cells mixed with a few spindle-shaped cells, and beneath this stratum again was another of fibrillar areolar tissue generally lying parallel to the surface, the fibrillæ being here and there collected into bundles in different stages of development. The vessels were richly developed and the elastic tunic of the arteries thickened. The glandulæ were numerous, the gland-cells not being recognizable in some places, and the appearances were those of chronic rhinitis with more or less advanced cirrhosis of the mucous membrane and a partly infiltrated and atrophied condition of the glandulæ."

Zaufal thinks the small size of the turbinated bones is not due to atrophy, but to arrested development.

Zuckerkandl, by an examination of two hundred and fifty-two skulls, has apparently disapproved Zaufal's views.

The discharges and crusts of ozæna consist of pus-corpuscles, granular débris, and some epithelium, and are usually of an alkaline reaction.

Krause contends that the mucous cells undergo fatty degeneration, and says he has found in the secretion of ozæna fatty corpuscles and pigmentary molecules, which form a part of the tenacious crusts.

Quite recently Habermann, of Prague, finds that true ozæna consists in an affection of all the glands; first there is an accumulation of drops of fat in the glandular epithelium, and later a complete degeneration of the epithelium takes place.

At a later stage there is inflammatory infiltration of the mucous membrane with granular degeneration of the infiltrated cells, while at certain points the drops of fat already described by Krause are observed.

* See writer's remarks, Trans. Am. Laryngological Association, 1886.

The osseous structures and venous sinuses alike suffer atrophy.

Moure, of Bordeaux, inclines to the opinion that the atrophied turbinated bodies in true ozæna are regenerated as the patient advances in age or as the disease diminishes in severity under treatment.

Symptoms.—To the intelligent and frequent performance of *anterior* and *posterior rhinoscopy* much that is accepted at the present day concerning the diagnosis, symptomatology, and proper treatment of rhinitis chronica atrophicans fœtida (true ozæna) is directly attributable.

With the aid of the rhinoscope we are enabled to note every change in *objective symptoms* resulting from treatment or otherwise, and can readily assure ourselves of the special points at which mucous collections are wont to lodge, and thus are able to effectually remove the same.

Rhinoscopy generally demonstrates the presence of dried mucus, fetid crusts, and capacious nasal chambers dependent upon the smallness or entire absence (?) of the inferior turbinated bodies, all of which are briefly the salient features of true ozæna.

The crusts are often found distributed over the entire surface of the nares, more commonly, however, moulded over the middle turbinated bones, post-nasal orifices, and pharyngeal vault. The morbid changes giving rise to fetor in true ozæna appear to be confined to the narrower portions of the nares, the pharyngeal vault habitually escaping.

The *constitutional symptoms* of ozæna, when present, are those pertaining to the particular diathesis with which ozæna is associated, namely, scrofula, syphilis, or tuberculosis.

Fig. 2731.—Profile of a Child of Twelve Years, suffering from True Ozæna. (Writer's case.)

Dyscrasia and general systemic disturbance, perhaps illy defined, are nearly constant accompaniments of ozæna, and if not present from the incipiency of the disease, appear at a later stage.

We have all encountered atrophic rhinitis with ozæna in apparently healthy children and adults, but such a state of health is exceptional and not destined to be of long duration, for the mere inspiration of tainted air by such a patient will finally result in impairment of his general health. The facial expression and shape of the nose is quite characteristic in many ozænic patients; we have the strumous facies, thick lips, prominent cheeks, submaxillary glandular enlargement, the bridge of the nose is depressed near the frontal bone, the anterior nasal orifices, instead of opening downward, often look outward anteriorly.

The saddle nose is Zaufal's name for the above state of affairs. Fig. 2731 represents the profile of one of my ozænic patients.

The shape of the nose appears to have had great influence with the Emperor Nicholas, of Russia, in selecting his famous regiment, "the Imperial Nosegay."

Before the Crimean war he discovered by some means that the best fighting and most ferocious men possessed a nose which stood straight out from the base of the forehead in the form of a triangle, presenting in front the appearance of a double-barrelled pistol.

This crack regiment of a thousand men was ultimately routed by the French, and the defeat was attributed to a peculiar sensibility of the nose regiment for garlic, of which the Frenchmen are so fond and had eaten, and with the odor of which the atmosphere of the battle-field was loaded.

When charged with cowardice, "the Imperial Nosegay" said they could and would face any foe; but the odor of the garlic-eating Frenchmen was too much for them.

Antecedent history frequently affords no clue to the existence of diathesis in these patients, and they are often entirely ignorant of their nasal affection until those associated with them perceive the stench. It is proper to state again at this point that several authorities consider ozæna a local disease, entirely independent of diathesis.

The foul-smelling exhalation occasioned by ozæna is the most prominent symptom, and frequently renders the patient a burden to himself and an object of avoidance by those brought in contact with him. Patients are occasionally totally unconscious of these foul emanations, for the reason that olfactory sensibility is blunted by either atrophic changes or the ever-present odor.

When the discharges are copious and there is the characteristic incrustation and tenacious adhesion of scabs to the nasal membrane and turbinated bodies, the breath becomes particularly offensive, even saturating the air of an ordinary room with the foul odor. The writer on several occasions has been forced to exclude ozænic patients from

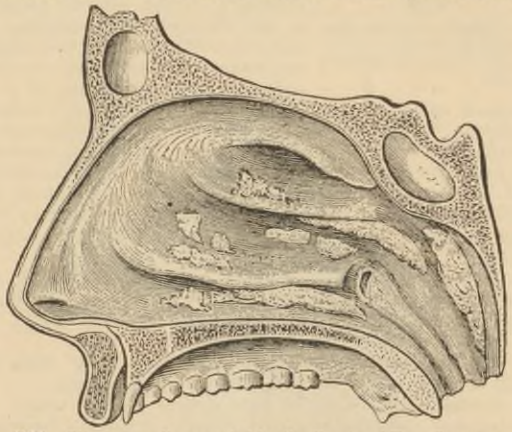

Fig. 2732.—Sites generally occupied by the Crusts of True Ozæna, as revealed by Anterior and Posterior Rhinoscopy. (Writer's case.)

his reception-room and treat them at special hours, so objectionable was their presence to other patients.

The crusts are of a greenish or grayish-brown color, often streaked with blood; they accumulate in both the anterior and posterior nares and the naso-pharynx, causing great embarrassment to nasal respiration, and frequently occasion nausea and vomiting when the patient makes an effort to dislodge them. Frontal and supraorbital pains, anorexia, depression of spirits, perverted taste, loss of smell, and dulness of the mental faculties are common symptoms.

The olfactory sense may be partially or entirely lost, and the disorders of taste resulting therefrom may seriously interfere with nutrition, by rendering certain foods (meats) distasteful.

M. Martin recognizes, in common with Zaufal, that slight functional disorder of the ear, and perhaps otitis, may occur as a complication of ozæna, as of other nasal affections. According to Loewenberg, the immunity of the middle ear in this affection is wellnigh universal. Catarrh of the lachrymal canal, epiphora, catarrhal conjunctivitis, and weakness of the eyes are among the complications of the disease under discussion.

There is usually considerable irritation and dryness of the pharynx, and its membrane is generally either covered by a thin pellicle of dessicated secretion, or is of a dry, glistening appearance if the crusts have been previously detached.

The number and size of the crusts discharged vary greatly; they are not usually larger than an almond-shell, and one is usually discharged every few days from either nostril. I have known, however, two crusts of large size to escape daily from each nostril.

The velum pendulum palati is almost universally deprived of its normal sensibility, and a posterior rhinoscopic exploration can be readily accomplished.

Such an examination, as before indicated, shows that the mucous membranes are everywhere pale, covered here and there by inspissated tenacious mucus, and that the soft tissues adhere closely to the underlying osseous structures, thus giving to the posterior nares an abnormally large appearance.

Figs. 2732 and 2733 are drawings made from one of my patients suffering with true ozæna, and show the points at which crusts are usually found, as revealed by anterior and posterior rhinoscopy.

Fig. 2733.—Posterior Rhinoscopic Image in a Case of True Ozæna. (Writer's case.)

The atrophied condition of the nasal mucosa and thinness of the turbinated bones is also well marked in this typical case.

Diagnosis.—The diagnosis of "true ozæna," *i.e.*, atrophic rhinitis with fetid secretions, is both important and devoid of serious difficulty, if the modern methods at our disposal for exploring the nares be utilized. After thoroughly cleansing the nostrils of all crusts and mucosities by means of a detergent spray or douche, containing, preferably, Dobell's solution,* a careful anterior and posterior rhinoscopic examination is to be made, when, if ulceration, necrosis, polypi, foreign bodies, etc., are present, they can hardly be overlooked. The general history of our patient, and the persistence of fetor in symptomatic ozæna, after freeing the nares of accumulated secretion, must be kept in mind.

Several cases of symptomatic or simulated ozæna, due to the presence of plum-stones, cherry-stones, buttons, pebbles, etc., have been reported by Holmes, Coote, Tillaux, and others.

The extraction of the foreign body in these cases was followed by cessation of the symptomatic ozæna.

Prognosis.—Cases of true ozæna do not apply for treatment until the disease has existed quite a length of time, and is well established. Hence a cure is wrought with many difficulties, and can only be attained, if at all, by a persistent and long-continued therapeutic, hygienic, and dietetic régime. The writer firmly believes in the occasional curability of true ozæna.

The prognosis depends greatly upon the state of the patient's general health, his age, occupation, etc. If there is a marked scrofulous diathesis, we can materially mitigate the severity of the nasal symptoms, as well as contribute much toward rendering the ozænic manifestations comparatively endurable, but this is the extent of our present ability.

The disease is obstinate in the extreme, but grows less and less apparent as the patient advances in age; and the writer has seen it practically disappear at the age of forty.

While we are unable to achieve brilliant results in always curing ozæna, our numerous and efficient palliative methods may practically reduce the inconvenience of our patient to a minimum and result in great improvement of his general health. Systematic cleansing and disinfection of the nares deprives the inspired air, which is otherwise tainted and laden with decomposed effluvia, of its toxic influences, thus improving the general health.

During the writer's professional experience he has been called upon to treat several obstinate and aggravated cases of ozæna occurring in young ladies, circulating constantly during the season in the captivating social festivities of the capital of the nation. The daily dissipations of these belles were never interrupted, and their infirmities, thanks to science, have never been the subjects of suspicion. This favorable state of affairs, it is but fair to state, was only secured by the most assiduous use of detergent and antiseptic medicaments—such assiduity as highly sensitive persons would gladly avail themselves of to cover their repulsive infirmity.

Treatment.—The *treatment* of true ozæna is both *systemic* and *local*.

Systemic treatment should consist of tonics and alteratives administered in such manner and at such times as to improve the tone of the system and of the assimilative functions. For the anæmia attending ozæna, the preparations of arsenic, quinine, iodine, or iron, such as the tincture of the chloride, the syrup of the phosphates of iron, quinine, and strychnine, or bismuth, the mistura ferri composita (Griffith's myrrh mixture), or the syrup of the iodide, should be employed. Donovan's, Pearson's, or Fowler's arsenical solutions, as well as Lugol's iodine solution, are at times required by the exigencies of the case.

The writer has obtained excellent results from gold chloride, or gold and sodium chloride, $\frac{1}{10}$ to $\frac{1}{4}$ gr. three times daily. Where there is debility, loss of appetite, and emaciation, the syrup of the hypophosphites or lactophosphates of lime, sodium, potassium, or iron, either singly or combined, will be of service. Cod-liver oil, malt extracts, hydroleine, oleo-chyle, or, above all, a palatable preparation containing cod-liver oil, long used in the District of Columbia, the formula for which is herewith given, may render valuable service.

Mistura Phosphatica (*D. C. P.*).

℞. Dilute phosphoric acid	f ℥ jss.
Yolk of eggs	℥ iij.
Cod-liver oil	f ℥ viij.
Glycerine	f ℥ ijss.
Oil of bitter almond	♏xx.
New England rum	f ℥ viij.
Orange-flower water	q. s.

Reduce the yolk to a smooth paste; add gradually the oils with constant trituration, then add eight fluidounces of orange-flower water during brisk agitation. Lastly, add the glycerine, rum, phosphoric acid, and enough orange-flower water to make the finished emulsion measure thirty-two fluidounces.

Where, in addition to the above symptoms, there is a well-defined strumous diathesis and special impairment of the digestive functions, the writer has obtained excellent results from the following formula, which he devised some years since, and which is now in general use in treating tuberculosis and other wasting diseases:

Pulvis hypophosphitum cum Pepsino (*Morgan*).

℞. Calcium hypophosphite	5 parts.
Sodium hypophosphite	5 "
Iron hypophosphite	2 "
Manganese hypophosphite	1 part.
Pepsin (Boudault's neutral)	8 parts.
Milk sugar	4 "

M.

This powder should be finely ground and kept, as well as dispensed, in glass. It can be prescribed in bulk, one-half teaspoonful (15 grs.) three times daily, stirred in cold milk, wine, water, brandy, etc. Lactopeptine, ingluvin, scale pepsin, or Scheffer's pepsin may be substituted in the formula for Boudault's pepsin. The preparations of mercury and potassium iodide are indicated when this disease is complicated with a syphilitic diathesis.

Climate appears to exert little influence on this disease. Abundant exercise, proper ventilation, avoidance of exposure, and perhaps sea-bathing, assist in bringing about a favorable termination of the affection.

Mineral waters, especially the sulphuretted, according to some writers, are beneficial when used either internally or locally.

* See correct formula, under Treatment, in this article.

There is urgent need of further investigations upon this point.

Clothing, etc.—The body should be warmly and comfortably clad, and every attention paid to the maintenance of cleanliness and of perfect action of the cutaneous and renal secretory functions.

Diet.—A well-regulated and sustaining system of diet, having due regard to proper action of the intestinal tract and the maintenance of bodily strength, is of first importance in managing the disease.

Local Treatment may be carried out by means of sprays, vapors, solutions, powders, ointments, medicated bougies, or cotton-wool tampons, medicated cotton, galvano-cautery, etc., and the objects sought to be obtained are: 1, the detachment of crusts; 2, their removal from the nares; 3, the correction of the fetid exhalations; 4, the prevention of crust formation, which latter amounts to curing the disease.

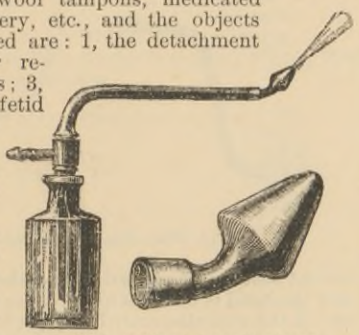

Fig. 2734.—Lefferts' Spray Producer.

Topical applications to the nasal passages and naso-pharynx should cause no unnecessary irritation of the mucous membrane, which is, as a rule, more sensitive than that of either the pharynx or the larynx.

They are to be persistently and regularly resorted to by the patient, who should be early impressed with their necessity and value. Most of the instruments devised for applying medicines to the nasal passages can be used by the patient on himself, but should not be entrusted to him exclusively.

Sprays may be both of a detergent and remedial nature, and afford a safe, complete, and easily applied method for the management of true ozæna. They may be administered from the hand-ball spray apparatus, from the steam atomizer, from the more convenient compressed air-spray machines, or from a Lefferts' spray producer (Fig. 2734).

Detergent sprays should be of a rather mildly alkaline and antiseptic character, and should always be employed

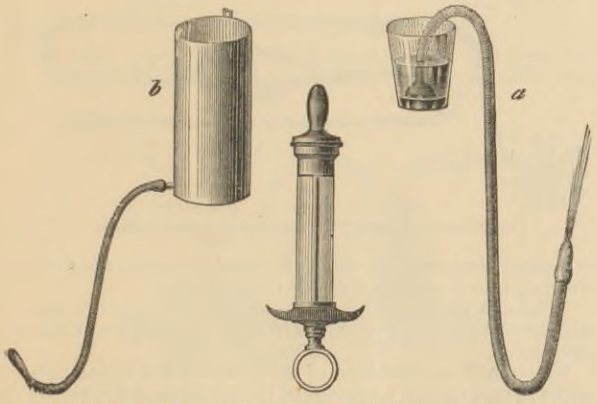

Fig. 2735.—*a*, Siphon nasal douche; *b*, Weber's nasal douche; *c*, barrel nasal syringe.

in the anterior and posterior nares before applications of medicine are made to the diseased parts.

The alkalinity of a spray facilitates the dissolving of crusts, and its antiseptic ingredients correct the toxic effects of decomposing secretions upon the nares and general health.

Among the most useful of this class is *Dobell's solution*, of which the *original formula* is herewith given, with Dobell's statement that ammonium chloride, potassium chlorate, or Condy's fluid may be used in the place of the borax.

*Dobell's Solution.**

℞. Sodii boratis..... ʒ j.
Glycerini acidi carbolici (Br. Ph. or U. S. Ph., 1870)..... f ʒ ij.
Sodii bicarbonatis..... ʒ j.
Aquæ tepidæ (90° F.)..... Oss.
M.

There are several questionable modifications of the above formula, all incorrectly passing under the name of Dobell's solution, and care should be exercised in obtaining a well-made solution.

Another detergent and antiseptic spray is:

℞. Sodii boratis,
Sodii carbonatis.....āā ʒ j.
Liq. sodæ chloratæ..... f ʒ ss.–f ʒ iij.
Glycerini..... f ʒ vj.
Aquam.....ad f ℥ iv.
M. Sig.—To be used as a spray.

Collunarium Zinci Boratis Co. (Morgan).

℞. Zinc chloride..... gr. xx.
Boric acid..... gr. xv.

After dissolving in twelve fluidounces of distilled water the solution is to be neutralized with water of ammonia. Lastly, add two fluidounces of glycerine, and filter. It can be used as a wash or spray, pure or diluted with water.

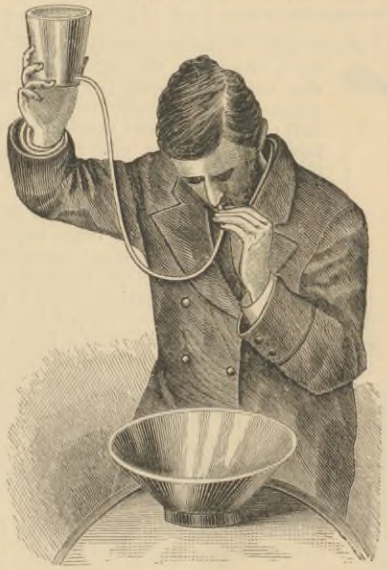

Fig. 2736.—Method of Using the Nasal Douche. (Bosworth.)

The writer makes daily use of the following formulæ as cleansing agents in the form of spray or solution:

℞. Listerine,
Glycerini boracis.....āā f ʒ ij.
M. Sig.—To be used in the spray in the proportion of one part to seven of water.

℞. Ominico..... f ʒ jss.
Glycerini boracis..... f ʒ ijss.
M. Sig.—To be used in the spray in the proportion of one part to seven of water.

℞. Thymol..... gr. j.
Alcoholis..... f ʒ j.
Glycerini..... f ʒ ij.
Aquam.....ad f ℥ j.
M. Sig.—Use as a spray.

* See Dobell on Winter Cough, etc., 8vo, third edition, 211. London, 1875.

The infusum picis liquidæ (U. S. Ph.) constitutes a soothing and highly disinfectant preparation, used either as a spray or wash. Acidum carbolicum ♏xx., or creasotum ♏xx., to aq. calcis Oj., will be found an efficient spray or wash.

Sprays of the following medicaments, in the strength indicated to the ounce of water, are recommended either as antiseptics, detergents, astringents, or resolvents: Ammonium chloride, gr. v.–xxx.; potassium permanganate, gr. ij.–v.; potassium chlorate, gr. v.–x.; zinc sulphate, gr. j.–x.; zinc sulpho-carbolate, gr. j.–x.; zinc chloride, gr. j.–x.; sol. chlorinated soda, ♏xx.–f ʒ j.; chlorine water, ♏xx.; creasote, ♏ij.–v.; carbolic acid, ♏ij.–v.; boric acid, gr. j.–x.; sodium benzoate, gr. iij.–x.; gold chloride, gr. j.–v.; gold and sodium chloride, gr. ij.–v.; glycerite of borax, f ʒ j.–f ʒ iij.

Where a mildly astringent, alkaline, and antiseptic spray is indicated the following may be used:

℞. Acidi carbolici cryst ..... gr. x.
Pini canadensis ext. fld ..... f ʒ j.
Glycerini boracis ..... f ʒ iij.
M. Sig.—One part to seven of water in spray.

Vapors are occasionally beneficial and must be inhaled at a temperature of from 140°–150° F. from a cup Martindale or Bullock inhaler, or other apparatus, furnished with a suitable nasal fitting, into which water and the desired medicament have been placed. Among the most useful of the moist or steam inhalations are:

℞. Creasote ..... ♏v.–x. to water Oss.
Tr. benzoin comp. f ʒ ij.–f ʒ iij. to water Oss.

To the above may be appropriately added the vapor acidi benzoici; the vapor acidi carbolici; the vapor ammonii benzoati; the vapor ammoniæ; the vapor cubebæ; the vapor iodi; the vapor pini sylvestris; the vapor terebenæ, and the vapor thymolis, all of the London Throat Hospital Pharmacopœia.

Fig. 2737.—Post-nasal Syringe.

The patient should remain in-doors for some time after using these vapors.

The fumes of nascent ammonium chloride may be inspired through the nasal passages by the patient from a Kirkwood or other inhaler, or forced into the anterior nares from a Cohen-Lewin inhaler, and are beneficial in promoting secretion. An excellent method for the administration of nascent fumes of ammonium chloride is to place the patient in a closed room and generate the fumes from sodium chloride and sulphuric acid mixed in one saucer, and water of ammonia in another by its side.

In this manner a prolonged inhalation can be taken with little effort to the patient.

This particular process is, so far as I am aware, due to Dr. William M. Mew, U. S. Army Chemist, Washington, D. C., and has been long and successfully used by the writer.

A simple, inexpensive inhaler may be contrived by placing a small piece of sponge in a glass tube of one-fourth inch bore, and moistening it with a mixture composed as follows:

℞. Creasoti ..... f ʒ j.
Tinct. iodi ..... f ʒ vj.
Chloroformi ..... f ʒ j.
M. Sig.—Ten or more drops on sponge inhaler.

The above mixture may be inhaled through the nares from a sponge attached to an ordinary respirator, which may be worn for fifteen minutes morning and evening.

Solutions are best employed by means of the anterior (Fig. 2735) or posterior (Fig. 2737) nasal syringe, the siphon (Fig. 2735), or Weber bottle douche (Fig. 2735), or they may be snuffed from the palm of the hand or squeezed into the anterior nares from a sponge previously charged with the remedy. Some precautions are to be observed in the use of these cleansing solutions by means of the douche, as they may in rare instances cause ear trouble by passing into the Eustachian tube, and even into the cavity of the middle ear.

The principal cause of such an accident is traceable to involuntary swallowing during the use of the douche, or to douching with cold water.

In employing a Weber nasal douche the bottle is elevated (see Fig. 2736), the nozzle is inserted into the nar-

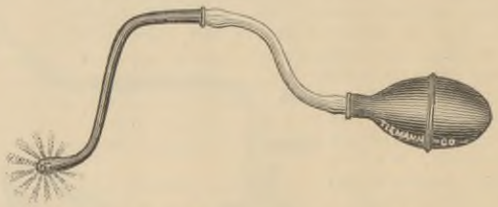
Fig. 2738.—Warner's Catarrhal Douche.

rowest nostril and pressed firmly, the mouth is held open, and the head is bent forward, when the stream will flow out of the opposite nostril if there is no obstruction.

About twelve ounces of liquid at 90° F. are to be used in each nostril, when all crusts and scabs will usually be detached and washed out.

If any crusts remain after this irrigation, they may be removed by mopping the nostrils with cotton, and, indeed, by using the forceps for their extraction.

The barrel syringe (Fig. 2735) can be used for cleansing the nares from the front, being introduced first into one and then into the other nostril, part of the liquid escaping by the mouth and part by the nostril it originally entered. If, however, the nostril is tightly compressed around the nozzle of the syringe, the mouth held open, and the head bent forward, the liquid may be made to escape through the opposite nasal passage.

The post-nasal catarrh syringe (Fig. 2737), and Warner's catarrhal douche (Fig. 2738), are both almost indispensable for cleansing the parts by way of the pharynx and posterior nares, and in using them the nozzle is inserted behind the palate, the head thrown forward, and the in-

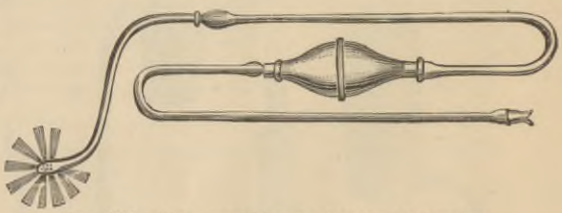
Fig. 2739.—Post-nasal Tube attached to a Bulb-syringe.

strument discharged through the nasal passages, the fluid flowing into a bowl in front of the patient.

Warner's douche (Fig. 2738) can be more readily manipulated by the patient himself than can the post-nasal syringe.

Systematic applications of solutions to the nasal passages in true ozæna, by means of the appliances described, will enable us to do much toward improving the general health of the patient and curing his local disease.

The solutions employed in the nasal douche, catarrhal douche, post-nasal or barrel syringe, etc., should have a temperature of about 90° F., and appended is a list of serviceable formulæ for such purposes, in the strength indicated to one pint of water: Carbolic acid, gr. v.–x.; sodium chloride, ʒ ss.–ʒ j.; sodium carbonate, ʒ j.–ʒ iij.; sodium borate, ʒ j.–ʒ iij.; creasote, ♏v.–x.; potassium permanganate, gr. ij.–x.; calx chlorata, ʒ ss.; liq. sodæ chloratæ, f ʒ ij.–f ʒ vj.; zinc sulphate, gr. v.–x.; zinc sulpho-carbolate, gr. v.–xv.

The addition of from one-half to one ounce of glycerine to the pint in any of the above is to be advised.

Powders.—Much has been written against the use of insufflations into the nares in treating nasal affections, but the writer is personally very partial to the employment of these preparations in suitable cases.

Powders should be used only after the diseased parts have been thoroughly cleansed and disinfected by the physician or patient, and must be evenly applied and not allowed to cake in the sinuosities of the nostrils.

Some of the powders commonly resorted to are:

℞. Iodoformi ..... 1 part.
Acidi tannici ..... 1½ part.
Lycopodii ..... 2 parts.
M. Sig.—For use in the anterior or posterior (Figs. 2740 and 2741) nasal powder-blower.

℞. Acidi boracici ..... 1 part.
Resorcinæ ..... 1 part.
Lycopodii ..... 2 parts.
M.

℞. Iodol ..... 1 part.
Lycopodii ..... 3 parts.
M.

℞. Hydrarg. chloridi mitis ..... 1 part.
Amyli ..... 2 parts.
M.

℞. Hydrarg. oxidi rubri ..... 1 part.
Sacchari albi ..... 30 parts.
M.

℞. Hydrarg. ammoniati ..... 1 part.
Sacchari albi ..... 30 parts.
M.

℞. Acidi salicylici ..... 1 to 3 parts.
Lycopodii ..... 10 parts.
M.

℞. Pulvis sanguinariæ ..... 1 to 2 parts.
Lycopodii ..... 2 parts.
M.

℞. Pulvis galangæ ..... 1 to 2 parts.
Lycopodii ..... 2 parts.
M.

℞. Iodoformi ..... 1 to 2 parts.
Lycopodii ..... 2 parts.
M.

These powders should be finely ground and kept dry; they are to be applied evenly from an anterior (Fig. 2740).

Fig. 2740.—Anterior Nasal Powder-blower. (Smith.)

or a posterior nasal insufflator (Fig. 2741), and preferably by the physician, although patients in time become quite expert in using these instruments.

The powder-blower preferred and used exclusively by the writer is one of his own design (Fig. 2742), and has the advantage of being universal and of being suitable for office work or outside practice. In the first instance this insufflator can be worked by the office compressed-air apparatus, in the latter by the hand bulbs, which run an ordinary spray. It will be noticed that the frequent and annoying accident which occurs with most insufflators, the drawing up of mucus and the caking of powder in the tube when the bulb expands, cannot take place in this instrument.

Again, the instrument is charged with a known quantity of powder, which is discharged into the nares, and not an indefinite amount from a powder bottle, as is generally the case.

This powder-blower is furnished

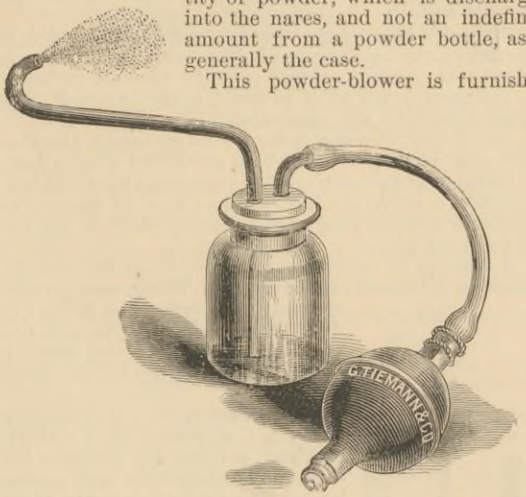

Fig. 2741.—Posterior Nasal Powder-blower. (From Robinson.)

with a scoop, and the exact amount of powder desired can readily be placed in the instrument. A trigger controls the air-blast, and the attachments for the anterior and posterior nares, ear, larynx, etc., are made to screw on, thus insuring safety.

Ointments are frequently of great value in treating this disease, and are by no means resorted to as often as they should be.

These preparations can be applied by means of a camel's-hair pencil or cotton carrier to the nasal passages, and exert a soothing disinfectant and curative influence.

Among the ointments worthy of mention are: Unguentum cadmii iodidi, unguentum hydrargyri ammoniati, unguentum hydrargyri iodidi rubri, unguentum hydrargyri nitratis, unguentum iodi, unguentum iodoformi, unguentum picis liquidæ, and unguentum sulphuris, all diluted with cosmoline, vaseline, or simple ointment to suit the particular case.

℞. Atropiæ ..... gr. ss.
Iodi ..... gr. iij.
Acidi carbolici .. gr. iij.
Petrolati ..... ʒ j.
M. Sig.—Apply to nares with a brush.

℞. Iodol ..... gr. xv.–xxv.
Ungt. aq. rosæ ʒ j.
M.

℞. Iodoformi ..... gr. xij.
Acidi carbolici cryst. ..... gr. v.
Iodi ..... gr. iij.
Petrolati ..... ʒ j.
M.

Fig. 2742. — Morgan's Compressed Air-scoop Powder-blower, showing detachable anterior and posterior nasal, ear, and laryngeal attachments. Adapted for use with rubber bulbs or with the office air-receiver.

Medicated bougies are occasionally of service in treating ozæna, the most useful being buginarium acidi carbolici,

buginarium iodoformi, buginarium thymol, etc., of the London Throat Hospital Pharmacopœia. When these bougies, which have as their basis gelato-glycerine, are introduced into the nostril they gradually dissolve, thus bringing the medicament into intimate and prolonged contact with the affected mucous membranes.

Medicated cotton-wools were introduced by Woakes, and medicines can by their use in the nares be brought into direct and constant contact with the diseased surfaces.

The gossypium acidi boracici, gossypium iodi, gossypium iodoformi, etc., are valuable formulæ.

The writer, in using these wools, generally plugs only one nostril or a portion of both nostrils at a time.

Cotton-wool tampons are recommended by Gottstein to promote a moderate but constant flow of mucus, thus preventing the drying of the mucus, which is the cause of the fetid odor.

A tampon of cotton-wool is introduced into the nasal passages by means of a screw (Fig. 2743), and permitted to remain therein a few hours every day. This treatment is said to be very beneficial in special cases, but must be persevered in for several years.

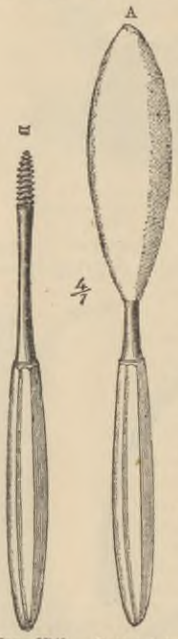

FIG. 2743.—Gottstein's Cotton-wool Tampon. A, screw armed with wadding-tampon; B, the unarmed screw. (Mackenzie.)

The galvano-cautery is recommended by a few writers (B. Fränkel) as exerting a decidedly curative influence upon ozæna when used cautiously and over limited areas of the diseased Schneiderian mucous membrane and submucous tissues.

The entire nasal membrane should be cauterized during this treatment, which may consume a month or more for its completion.

The middle and inferior turbinated bodies, the roof of the nose, and, lastly, the septum should undergo cauterization. No complications worthy of mention result from such applications, and no extensive sloughing need be anticipated.

These cauterizations certainly tend to materially reduce the viscid secretion and the subsequent formation of crusts, by a reparation of the mucous membrane.

Harrison Allen appears to rely on the galvano-cautery also as a cleansing agent, and states that if a spiral-looped electrode be introduced cold into the nares and pressed against the crusts, and the electrode is heated, so firm an adhesion takes place between the heated electrode and the incrustations as to permit of their speedy and complete removal.

He states that when, after the removal of all visible crusts, the fetor persists, it is reasonable to infer that the palatal depression of the floor of the nose is filled with decomposed mucus.

The electrode, properly curved and introduced, will bring away quantities of discharge, which cannot be removed in any other way, not even by douches, etc.

Chemical caustics are, in the writer's opinion, seldom indicated in the treatment of true ozæna, although silver nitrate, chromic, acetic, and nitric acids have been recommended by a few authors.

Animal grafting by means of frog's skin and galvanism have recently been used in the treatment of ozæna.

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Ethelbert Carroll Morgan.

PÆONY (*Pivoine officinale*, Codex Med.). The Garden Pæony, *Pæonia officinalis* Linn.; Order, *Ranunculaceæ*, which is too familiar to need description, is a native of Southern Europe, and perhaps a development of *P. peregrina* Miller, of the same region. It occurs in white and red varieties, and with single, five-, or ten-petalled, or very double flowers. It is a perennial herb, with tuberous roots. The petals, seeds, and roots are official in France. The former, usually gathered from red, double flowers, and sometimes with their color heightened by acid, have a bland taste, but little odor, and no medicinal properties. They are used to give lightness and color to some sachet powders. The seeds—round, dark, and rather shiny, about as large as small peas—are said to be used in Europe to string into necklaces as charms for teething children. The roots, generally peeled, and if large sliced and dried, have a bitterish, astringent, acrid taste, with but little odor. They contain mucilage, tannin, coloring matter, and some other not very definite substances. Pæony root was formerly used as an antispasmodic, but is now obsolete.

ALLIED PLANTS.—See ACONITE. *W. P. Bolles.*

PAGOSA SPRINGS. *Location and Post-office*, Pagosa Springs, Conejos County, Col.

ACCESS.—By the Denver & Rio Grande Railway to Del Norte or Alamosa; thence by conveyance.

ANALYSIS.—One pint contains (140° Fahr.):

	Grains.
Carbonate of soda	0.342
Carbonate of magnesia	0.353
Carbonate of lime	4.300
Carbonate of lithia	0.051
Chloride of sodium	2.132
Sulphate of potassa	0.519
Sulphate of soda	16.146
Silica	0.415
Organic matter	trace
Total	24.258