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DISEASES OF THE NOSE

AND ITS

ACCESSORY CAVITIES.

BY

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PREFACE.

THE present work was undertaken with the hope, that by condensing and systematising the vast mass of material, including original and quoted cases, new facts and observations, new remedies, descriptions and classifications of disease, all relating to the subject of affections of the Nose, a certain void in Medical Literature might be filled up, and a ready means of reference afforded to the busy medical practitioner. In systematic works on General Surgery and Medicine these various novelties are, as a rule, only lightly touched on, in consequence of other more important or more interesting matter claiming the space that would otherwise have been allotted to them. The only articles in the English language on the subject of Diseases of the Nose are those in Mr. Timothy Holmes' "System of Surgery," viz., one by the late Mr. Ure, in the first edition, and that by Mr. Durham, in the more recent editions. These articles, though most valuable and interesting in themselves, can only deal with the subject in a very brief and partial manner, and, from the necessary limitation of space, unavoidably omit much that may fairly find a place in a work devoted to the more limited field of Medical Science forming the subject of this Treatise. That some such a work was called for may be concluded from the fact that

in the year 1830 the Council of the Royal College of Surgeons of England offered the Jacksonian Prize for a Treatise "On Injuries and Diseases of the Nose and the Nasal Sinuses." No competitors, however, presented themselves for the Prize. One of the reasons for this want of competition may have been that the subject was so large and required so much labour to bring it to anything like perfection, that no Surgeon found the time to carry out the work satisfactorily to himself within the limited period laid down by the rules of the College. In 1834 the subject was proposed by the Council of the College a second time, and the Prize was awarded to Mr. Dickinson Webster Crompton. This gentleman's Treatise is in Manuscript in the Library of the College, but has never been printed. It is a very interesting work, but too limited in its scope and aim to deal with the multitude of facts and details of the Surgery of the Nose as it stands to-day. In the fact that, notwithstanding the existence of this Treatise, the Council of the College should have offered a Prize a third time (viz., in the year 1872) for an essay on the same subject, I recognise the tacitly-expressed opinion of the most eminent living Surgeons that such a work is looked for by the Profession, and that Surgical literature is not in so complete a state, but that it may be improved by the addition of a monograph on Diseases of the Nose.* Whether the present work will satisfy the requirements of the Profession, I must

* No prize was awarded in 1872. Besides the prizes offered for the subjects already noticed, the following have been offered for Treatises on allied subjects, viz. (1) for one "On Injuries and Morbid Affections of the Maxillary Bones, including those of the Antrum," for which no Dissertation was received in 1842, though when the same subject was proposed in 1867 the prize was awarded to Mr. Christopher Heath; (2) for one "On Diseases of the Lachrymal Passages, &c," for which no dissertation was received. It is partly on this account that the diseases of the antrum and lachrymal passages have been included among those dealt with in the following pages.

leave to my readers to decide. If, however, without laying claim to originality of research or observation, I have succeeded in putting before the Medical world a fair representation of the Surgery of my particular subject, I shall be satisfied with having fulfilled the object proposed to myself from the commencement.

I have availed myself freely of the works of past and contemporary, British and foreign authors, the references to which are given in the body of the work, and I must particularly express my acknowledgments to Drs. George Johnson, Charles Murchison, Tilbury Fox, Hughlings Jackson, John Harley, William Ogle; to Sir James Paget, Sir William Fergusson; to Messrs. John Gay, Henry Lee, John Wood, William Adams, Campbell de Morgan, George Lawson, G. Green Gascoyen, Timothy Holmes, Warrington Haward, Francis Mason, Arthur Durham, Thomas Bryant, John Swift Walker, and many other surgeons and physicians, for the valuable aid afforded me by their works, and in several instances their personal communications in the very extensive field of surgery covered by this Treatise. For the valuable assistance given me by my friend, Dr. Thomas Parker Smith, in collecting references and translating extracts from foreign authors, I cannot be sufficiently grateful. His extensive literary attainments and scholarship have also been of the greatest value to me, in correcting manuscript and letterpress; and from his experience as an Army Surgeon in India and elsewhere, he has furnished me with many useful hints in regard to the Treatment of Diseases of the Nose. To the custodians and curators of the Metropolitan Hospital Museums—especially those of St. Thomas', King's College, Middlesex, and St. George's—I am much indebted for opportunities of examining, photographing, and making drawings of

specimens. The pathological and physiological collections of the Hunterian Museums have also been of great service to me in the same direction.

Some apology is due for the introduction into the physiological inquiries in the first section of hypotheses, which will, perhaps, by some, be considered hardly warranted by the data at present at our disposal. With the hope that the time may be approaching for a more mature and scientific knowledge of the physiology of olfaction and for a better system of therapeutics founded thereon, I must commit my work to the indulgent judgment of the Medical Profession.

7, Henrietta Street,
Cavendish Square,
July, 1875.

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„ 72,	„ 29,	„	mucus,	„	mucous.
„ 75,	„ 33,	„	cork-crew,	„	cork-screw.
„ 144,	„ 5,	„	multi-loculæ,	„	multi-locular.
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„ 366,	„ 11,	„	to—rulæ,	„	torulæ.
„ 366,	„ 11,	„	fungi—if,	„	fungi, if.

SECTION I.

THE

ANATOMY AND PHYSIOLOGY

OF

THE NOSE AND NASAL FOSSÆ.

The Anatomy of the Nose and Nasal Fossæ.

The *nose*, the central, most prominent region of the face, is symmetrical, and divided by a median plane into a right and left half. Each half consists of a bony and cartilaginous framework, covered externally by integument and subcutaneous muscles, and internally by mucous membrane. At the lower and anterior part of each is an aperture (the nostril), by which the surface communicates with a cavity—the nasal fossa.

The *nasal fossæ* are symmetrically formed, one on either side of a median vertical septum (the septum nasi), by which they are divided into a right and left nasal fossa. Each is bounded externally by the nasal, superior maxillary, ethmoid, lachrymal, inferior spongy, palate bones, and pterygoid plates of the sphenoid, with their mucous coverings; above by the cribriform plate of the ethmoid in the centre, by the frontal and nasal bones in front, and by the body of the sphenoid and part of the palate bone at the posterior part; below by the palate; and in front by the union of the nasal bones and by the articulation of the nasal cartilages with the septum. Each fossa is capable of being narrowed laterally and expanded

by means of the muscles lying external to the cartilage; and by the peculiar arrangement of the mucous membrane covering the middle turbinated bone and a corresponding line of thickening of the septum, the cavity is divisible, when contracted, into two distinct and separate channels, an upper one passing towards and along the olfactory region—the olfactory channel, and a lower or respiratory channel. The mucous membrane covering the middle turbinated bone is prolonged into an elevation anteriorly, described by Meyer as the *agger nasi*. Its direction is nearly parallel with the dorsal ridge of the nose, running forwards and downwards, till it reaches very nearly to the anterior aperture of the nostril. This *agger nasi* approaches very near to a thickened portion of the septum, and a very slight lateral compression, as by the action of the compressor naris muscle, brings them into actual contact, and so divides the fossa into the two channels above alluded to. This arrangement will be found to be important in reference to the anosmia associated with facial palsy, and will be referred to in a future page.

Besides the anterior openings (the nostrils) by which they communicate with the external air, the nasal fossæ have each a posterior opening (the posterior nares), which makes their cavities continuous with that of the pharynx.

The furrows or depressions on the outer wall of each sinus formed by the projecting turbinated bones are termed meatuses. They are three in number—the superior, middle, and inferior.

Each fossa communicates with four sinuses—the frontal, above, opening, with the anterior ethmoidal cells, into the middle meatus through the infundibulum; the sphenoidal, behind, opening into the superior meatus; the maxillary or antrum Highmorianum, opening indirectly into the middle meatus at the lower part of the infundibulum (see Giraldès' treatise, "Des Cystes Muqueux"); and the posterior ethmoidal, opening into the superior meatus.

Each fossa also communicates with the conjunctival surface by a continuation of the mucous membrane of the inferior

meatus through the nasal duct, lachrymal sac, and the canaliculi and puncta lacrymalia.

The Functions and Minute Anatomy of the Nasal Fossæ.

The nose and its fossæ may be regarded in four different aspects—1, as a *sense organ;* 2, as a part of the *respiratory apparatus;* 3, as part of the *face* and of the *mechanism of expression;* 4, as part of the *vocal mechanism.*

First, regarded as a *sense organ,* it must be divided into (*a*) the *olfactory region proper,* or that part of the mucous lining of the nostrils upon which the olfactory nerves are distributed, and which is endowed with the sense of smell; and (*b*) the *Schneiderian* or *pituitary region,* comprising the remaining and by far the larger portion of the nasal cavities possessing only common sensation. These two regions differ in their structure as well as in their vital properties. The *olfactory region* is limited to the upper half of the septum, the superior turbinated bone, and perhaps half of the middle turbinated bone, together with the under surface of the cribriform plate of the ethmoid. The mucous membrane covering these bones is distinguishable, even to the naked eye, from that of the rest of the nasal cavities, by the presence of a yellowish or sepia-brown pigment, and by its evident thickness and softness as compared with the contiguous surface. Examined microscopically, this region is seen to be bounded by a tolerably well-defined, toothed or undulated border. The differences of structure depend upon the character of the epithelium, the occurrence of peculiarly constructed glands (Bowman's glands),*

* In men they are certainly not so numerous as in other mammalia; on the contrary, they are in part replaced by the ordinary clustered mucous glands. Their occurrence in men generally is nevertheless demonstrated. (Frey, "Histology," s. 597.)

It is probable that these glands may be more numerous in dark-skinned than in fair individuals; and hence they may be hardly discoverable in some specimens and abundant in others. It is one of their functions, apparently, to exude a pigmented secretion on the surface of the olfactory mucous membrane, as is

and upon the relations of the nerves. The epithelium is *not ciliated.* It is also thicker than in the Schneiderian region, so that in the sheep, whose ciliated epithelium is 0·03‴ in thickness, it measures 0·05‴, and in the rabbit the one is 0·04‴ thick, and the other 0·07‴. Notwithstanding this thickness, it is remarkably soft and delicate, and is so much affected by almost all reagents as to allow of its being studied only with considerable trouble.

According to Max Schultze, the epithelial cells are cylindrical (*a* in fig. 1), and terminate by truncated flat surfaces, with no discoverable membrane on these surfaces separate from the contents of the cell. The contents consist of protoplasma presenting a yellowish granular appearance in the outer part, whilst at the lower part an oval nucleus lying in the clear protoplasm can be readily distinguished. Towards their attached extremities these cells become attenuated, and can be traced inwards for a considerable distance, when they expand into a broad flat sheet or plate, which, whilst it frequently presents a granular appearance, is never coloured. The processes which pass off from this sheet appear to be continuous with the fibres of the submucous connective tissue. Towards the margin of the true olfactory region the cells are similar in form, but are surmounted by a circle of cilia (Carpenter's "Physiology," p. 684). This description, therefore, corresponds in all essential particulars with that of Fick and Ecker.

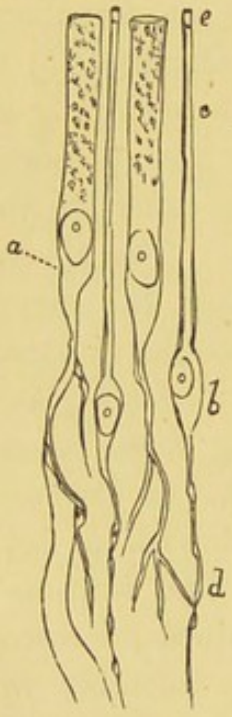


Fig. 1.
(*after Fick and Ecker.*)
Cells of the regio olfactoria of man. *a*, Epithelial cell; *b*, "olfactory cell," with the descending process *d*, and the peripheral rod *c*, beyond which projects a short offset *e*.

The *olfactory bulbs,* composed of white and grey matter,

seen in the olfactory region of the fox (see Ecker's plates), and it seems probable that in fair men, the pigment secreting function being feebly developed throughout, the olfactory region would partake of the general deficiency.

lie upon the lamina cribrosa of the ethmoid. From their under surface they give forth many branches, which, enveloped by sheath prolongations of the dura mater, enter the nasal cavities through the foramina cribrosa. Of these filaments an inner row is directed to the septum nasi, an outer row down to the walls of the sides of the nasal fossæ. These last lie upon the upper and middle spongy bones. The sheaths derived from the dura mater lose themselves in the periosteum. The little branches of the nerves soon break up like a brush, and unite one with another to form plexuses. The small branches of the olfactory nerve are not composed of medullated nerve fibres with a double contour, but of pale nucleated bands of a diameter 0·002‴—0·003‴. These bands, which resemble embryonic nerve fibres, do not, according to Dr. Schultze, correspond with primitive fibres, but are made up of a transparent sheath surrounding a bundle of primitive fibrillæ, every such fibrilla having a diameter of only 0·0001‴—0·0002‴. The bands of the olfactory nerve separate, while at last they take a direction towards the free surface of the mucous membrane in fine knotted threads, which have not as yet been followed to the end with certainty. According to Schultze's mode of viewing them, these threads were already clearly prefigured elements in the bands. A microscopic section delineated in Fick's work displays such a ramification of the nerve of smell in a dog. (Fick, s. 119.)

The Ending of the Nerves.

". . . . Concerning the mode of ending of the nerves of smell, many investigations have been set on foot of late which have yielded the following facts. Between the epithelial cylinders, above described, of the olfactory mucous membrane, there stand, in more or less regular distribution, some long slender rods. In fig. 1 there are two such rods represented (from man). The one to the outer side on the right is marked with *c*. Between stand two epithelial cylinders with nuclei at the bottom, and in the deepest part penetrating prolongations which ramify further below. The little rods terminate on a level with the epithelial cells, but they send, in addition, over the free surface a thin, long head-piece (top-

knot) 0·001‴—0·002‴. In the frog 6 to 10 extraordinarily long cilia (they reach to 0·04‴) take the place of this top-knot (fig. 2). They send off very slowly waving motions, which cause no perceptible currents in the surrounding fluidity. This very remarkable modification of this, at all events, significant structure for the sense of smell is, moreover, particularly represented in fig. 3 (of Fick's work, not here represented). [The same letters are used to denote corresponding parts in fig. 1 and fig. 2 in the text.]

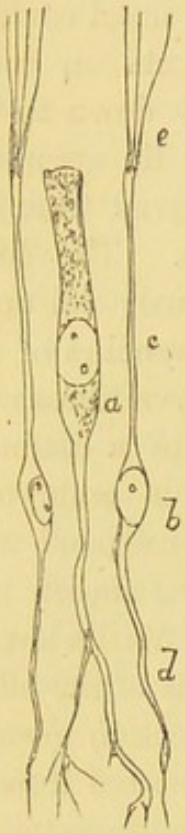


Fig. 2. (*from Frey's Histology.*) Cells of the olfactory region of the frog. *a*, epithelial cell; *b*, "olfactory cell;" *c*, peripheral rod of olfactory cell; *e*, cilia; *d*, central process of "olfactory cell."

"The little rods are prolongations from the cells (*b*, figs. 1 and 2). They differ essentially in appearance and microscopic reaction from the epithelial cells, have a nucleus like a small bladder, and fine molecular contents. It is scarcely to be doubted that these cells are of nerve matter, and we may regard them as ganglion cells.

"They present, when one looks at a perpendicular section through the olfactory mucous membrane, a particular appearance of a layer complete in itself. Provisionally the name of the 'olfactory cells' has been given to the cells in question. Each 'olfactory cell' sends off a prolongation opposite the little rod into the deep substance of the mucous membrane. It is for some distance swollen in knots, but very fine, and easily changed, and therefore difficult to examine. Although the connection of such a prolongation with the elements of the olfactory nerve has not, up to the present time, been seen with precision, it is nevertheless in a high degree probable.

"We can, therefore, without departing far from the ground of matters of fact, describe the nervous apparatus of the sense of smell in the following manner: every element of the olfactory nerve contains, lying immediately under the cylindrical epithelium of the mucous membrane, a ganglion cell, and projects beyond this as a fine rod, which also, in different animals, sends out a final variously formed prolongation (ciliated in the frog, a single top-knot in mammalia) above the surface of the epithelium free in the nasal cavities."
—Fick, "Anatomie und Physiologie der Sinnesorgane." § 120.

Closely analogous appearances have been seen and described by Lockhart Clarke (*Medico-Chir. Rev.*, 1862, vol. i, p. 521), (fig. 3), who states that the olfactory nerve fibres on reaching the base of the epithelial layer, divide into finer and still finer fibrils to form a network with numerous interspersed nuclei, through which they are probably connected with the olfactory cells (*f*, in fig. 3), although he has never been able satisfactorily to convince himself of such connection.



Fig. 3.
(*after Lockhart Clarke.*)
Cells of the olfactory region of man. *d*, *e*, the proper epithelial cylinders; *f*, the peripheral rod of the "olfactory cell."

Although the ciliated cells of the nasal fossæ are much more readily affected by water than those of other situations, this is true to a much greater extent as regards the cells of the olfactory region, and the destructive effect of the filling of the nasal cavities with water and other fluids is thus easily accounted for; as, also, on the other hand, is the ready transudation of volatile substances through the epithelium rendered intelligible. For the moistening and protection of the epithelium throughout the region in which it exists, it is furnished with a great number of the "glands of Bowman," which is the more remarkable, because the immediately contiguous, ciliated, mucous membrane is but scantily supplied with glands,* or is wholly without them. These glands are simple cylinders, either straight or slightly convoluted at the lower end, and 0·08‴—0·1‴ in length, or elongated pyriform follicles, situated principally between the larger branches of the olfactory nerves, in crowded rows, in part, however, more isolated, as at the lower boundaries of the olfactory region. . . . Their canals, 0·014‴—0·025‴ wide, are lined by a beautiful simple epithelium, composed of rounded polygonal cells, 0·006‴ to 0·008‴ in size, containing more or fewer yellowish or brownish

* According to Fick (p. 91) the Schneiderian membrane has numerous clustered mucous glands.

pigment granules, to which is due the varying colour of the olfactory mucous membrane. Their excretory ducts are rather more contracted than the glandular canals, and ascend, always lined by rounded larger cells, straight through the epithelium, in order to terminate on the surface with rounded orifices surrounded by a few large cells. The tissue beyond these glands is, as in other regions, soft connective tissue without elastic elements.

The ciliated portion of the mucous membrane, or "Schneiderian membrane," is that part of the mucous membrane which lines the remainder of the nasal cavities. Its structure varies in different parts, though the epithelium is ciliated over its whole extent. We may conveniently divide it into the *thicker* glandular mucous membrane of the proper nasal fossæ, and the *thinner* membrane of the accessory sinuses and of the interior of the spongy bones. Under the ciliated epithelium is a true membrana mucosa, wholly without elastic elements, or, at all events, very scantily supplied with them, and composed chiefly of common connective tissue. In the proper nasal fossæ there are embedded in this membrane very numerous larger and smaller racemose mucous glands of the usual kind, so that in places, especially at the borders of the septal cartilages and on the inferior spongy bones, it presents a thickness of 1‴—2‴. The thickness of the mucous membrane of these regions, however, does not depend upon the glands alone, but also, especially at the border and posterior extremity of the inferior spongy bone, upon *abundant, almost cavernous plexuses* in its interior.

In the accessory cavities the glands are probably less numerous, and, according to Kölliker, almost wanting, but in the antrum of Highmore they may be found in great abundance by macerating the membrane in a solution acidulated by nitric acid and afterwards in simple water. Numerous opaque yellowish glands can then be seen with the naked eye, arranged in regular lines on the internal wall of the cavity and more unequally distributed in other parts. Dr. Giraldès describes them as being so close set on the inner wall that five or six may be

counted in a space of half a square centimètre (about one-sixth of an inch). (See Giraldès' "Des Cystes Muqueux.") (See Plate I, fig. 3.)

Except in these places the mucous membrane of the accessory cavities is extremely delicate and inseparable as a distinct membrane from the periosteal lining therein; and the same may be said of it in the nasal fossæ themselves, particularly in the glandular parts, notwithstanding the intimate connection of the two. (Kölliker's "Human Histology," vol. ii, p. 417.)

The vessels in the true nasal fossæ are very numerous, less so in the accessory cavities, where the colour of the lining membrane is extremely pale, and more like a serous membrane in appearance. There are no true papillæ in the nasal mucous membrane, though the vessels give that appearance, where they form loops and numerous anastomoses.

The *nerves* are—1. Branches of the fifth pair (ethmoidal, posterior nasal, and a branch of the anterior dental), which supply especially the ciliated region, but also extend to the olfactory region. 2. The olfactory nerves, which supply only the non-ciliated olfactory region. 3. The vidian and naso-palatine, which supply the septum. 4. The anterior palatine, which supplies the middle and lower spongy bones The *arteries* are the anterior and posterior ethmoidal, from the ophthalmic; the spheno-palatine, from the internal maxillary; and the alveolar branch of the internal maxillary. The *veins* form a close network beneath the mucous membrane. They pass some with the veins accompanying the spheno-palatine artery, and others, through the alveolar branch, join the facial vein; a few communicate with the veins in the interior of the skull, through the foramina in the cribriform plate of the ethmoid bone. (Gray's "Anatomy," p. 582.)

Physical and Chemical Characters of Nasal Mucus.—The secretion of the mucosa of the nostrils, or nasal mucus, is the viscid and almost transparent semifluid which is familiar to every one. In health, however, it seldom attracts attention, being secreted in such small quantity, and often drying up so

completely, that it only requires to be removed at very long intervals in the form of semi-solid pellets or scales. If collected as a semifluid from the nostrils and evaporated, it remains in the basin as a yellow, somewhat glistening and tolerably transparent coating. It contains epithelial cells and a few mucous corpuscles, the latter being rounded granular nucleated cells of about the size of white blood corpuscles, and rendered transparent by the addition of dilute acetic acid, by which reagent their nuclei (from 3 to 5 or 6 in number) are rendered more distinct. It is not soluble in water, but if it remains in contact with that fluid for a considerable time it yields some mucin, in consequence of which, the addition of acetic acid to the water produces a very slight turbidity. It is neutral to test paper, and salt to taste, but is said by Simon to be slightly alkaline.

The following is an analysis of normal nasal mucus by Berzelius. In 1000 parts:—

Water	930·7
Mucin	53·3
Alcohol extractive and alkaline lactates	3·0
Chlorides of sodium and potassium .	5·6
Water extractive with traces of albumen and phosphates	3·5
Soda combined with mucus . . .	3·9

Berzelius finds *no fat* in normal mucus, but according to J. E. Bowman, a trace of fat is found, and Simon also gives a small proportion of fat as present in healthy mucus.

The physical and chemical properties of *nasal* mucus do not differ in any important respect from those of the mucus of the bronchial and air passages generally.

From a consideration of the foregoing details, we may realise the admirable adaptability of these fossæ for the purposes of the sense of smell: all the properties and structures of the different parts, and their relative position, and the position of each with regard to other adjacent organs, tending towards the protection of the sense-organ or towards the perfection of its special

function. And here I must notice that the sense of taste owes much more to the olfactory sense than has hitherto been acknowledged, until indeed, Dr. Wm. Ogle* pointed out that the idea of flavours is essentially a matter of olfaction and not one of taste. He adduces cases in which, when the sense of smell is entirely lost, all sense of flavours is also lost, though the ideas of salt, sweets, sours, or bitters may still be appreciated; and, on the other hand, shows that when access to the *olfactory regions* by the *anterior nares only* is closed, though there may be no appreciation of flavours or scents of any kind held to the nostrils, yet under such circumstances the flavours of meats and wines are perfectly recognized as long as the posterior nares are in free communication with the pharynx and mouth.

It is probably superfluous to insist on the fact that the olfactory region proper is alone the seat of the organ of smell, but for those who wish for evidence on this point I may refer to M. Deschamp's work on "Diseases of the Nasal Fossæ," pp. 62 et seq., and to Dr. Hippolyte Cloquet on "Osphrésiologie," where the whole evidence is brought forward most clearly and conclusively on pp. 350, et seq.

The experiments of Valentin ("De Functionibus Nervorum Cerebralium," &c., Bernæ, 1839) add still further confirmation of the same point. Two dogs with their eyes bandaged, one having the olfactory nerves and ganglia sound, and the other having had them destroyed, are brought into the neighbourhood of a dead decomposing animal; the former will examine it by its smell, the latter, even if he touches it, will pay no attention to it. This experiment, several times repeated by Valentin, always gave the same results. Hence it is evident that the olfactory region alone, to which only the olfactory nerves are distributed, has the faculty of olfaction.

It is remarkable that the sense of smell is, with very few exceptions, only excited by organic bodies, or the products of

* See *Medico-Chirurgical Transactions*, vol. liii., article "Anosmia," on pp. 263, et seq.

their decomposition. With the *inorganic* world the sense of smell has little to do, except, as it would seem, incidentally, as for instance, when a gas is so powerful and dangerous in its properties that its chemical effect on the olfactory region gives rise to a peculiar scent, in a manner analogous to, and possibly identical with, that of the electric current. All the other senses are affected equally by the *organic* and the *inorganic* world, but the sense of smell seems specially devoted to the detection of differences in organic substances and their products.* Few mineral substances, even in a gaseous state, have any smell at all. Ammonia, chlorine, iodine, bromine, nitrous acid, nitric oxide, sulphuretted hydrogen, arsenetted hydrogen, arsenic, seleniuretted hydrogen, and a few other gases, have each distinct odours, but it is probable that their effect on the mucous membrane of the olfactory region is of a chemical nature, and differs materially from the ordinary process of olfaction. Even among these few instances, we find four at least that may be regarded as commonly derived from the decomposition of *organic* substances, viz., sulphuretted hydrogen, ammonia, iodine, and bromine. The sense of pungency, common alike to strong acid vapours and strong alkaline ammoniacal vapour, is produced probably by irritation of the nerves of common sensation rather than those of smell, and seems designed rather as a protective to the lungs than as a means of discriminating the varieties of odoriferous articles of food.

Professor Graham† seems to be of opinion, that in the process of olfaction, there is always chemical change, and that this change consists in oxygenation of the odorous substance within the nostrils. This theory harmonises well with the fact that

* Butyric acid, *if much diluted*, produces the well-known *disagreeable* smell of tainted butter. If the nose be held over *fresh butyric acid*, and a strong inspiration be taken, there is a sensation of smell which may be described as *pungently acid*. It appears, therefore, that concentrated gaseous butyric acid excites particularly the nerves of common sensation, and, when diluted, those of smell.—Fick, p. 103.

† See "The Senses and the Intellect," by Alexander Bain, M.A. 2nd Edition. London, 1864. Page 168.

odorous substances are derived chiefly from the organic world, and that "odorous substances in general are such as can be readily acted on by oxygen." Chemical action, no doubt, gives rise to sensation on sentient surfaces, and the pituitary membrane is probably affected chemically by those substances that have the quality of pungency, such as ammonia and sulphurous acid; but this is not the kind of chemical change which Professor Graham supposes to be essential to the process of olfaction. He shows that gases, which are not capable of oxygenation at ordinary temperatures are inodorous, and gives two instances in proof of this, viz.: carburetted hydrogen, which is found in mines mixed mechanically with oxygen, but uncombined, and hydrogen which is also odourless, and does not combine with oxygen at any temperature endurable by the human tissues.

Of the most strongly odorous gases, sulphuretted hydrogen is a good example, and this is rapidly decomposed by the action of the oxygen of the atmosphere. In like manner, the hydrocarbons, such as the ethers, alcohol, and the essential oils, are all easily oxidizable. It is also shown that certain of the combinations of hydrogen have been actually decomposed in the act of producing smell. Thus when a small quantity of seleniuretted hydrogen passes through the nose, the metallic selenium is found reduced upon the lining membrane of the cavities. The action on the sense is very strong, notwithstanding the minuteness of the dose; there is an intensely bad smell as of decaying cabbage, and the irritation of the membrane causes catarrh.

The last mentioned circumstance points to an irritant action on the pituitary membrane generally, and seems to indicate that the olfactory region is in this instance only secondarily affected in consequence of chemical action, the primary action being an irritation of the nerves of common sensation, and of the mucous surface generally.

Taking into consideration these two features common to most odoriferous bodies, viz. (1), their organic origin, and (2) their ready oxidizability, we may, perhaps conclude, that *tendency*

to change of a chemical kind is an essential quality of odorous bodies; and it may be that when the tendency is towards the return to inorganic matter, the odour is disagreeable or disgusting, and acts as a warning to the animal affected by it, but that, when the tendency to change is in a direction favourable to the assimilability of the product with the animal tissues, the impression on the olfactory organ is of an agreeable and attractive kind. So that fœtid and nauseating odours are significant of putrescent change, the advanced stage in the progress of the organic towards the inorganic world, while fragrant, aromatic, etherial, alcoholic, ambrosiac (*e.g.* musk and amber) and alliaceous odours, indicate only the first stage of this progress, and are significant of the extreme maturity of organic growth immediately preceding incipient decay, rather than of an actual commencement of decay itself.

However much we may hesitate to conclude, from Professor Graham's observations, that olfaction consists essentially in an oxygenation of the odorous substance, and in the stimulant effect of that chemical process upon the sentient nerves of the olfactory region, we may yet look hopefully upon this theory as the germ of a rational classification of odours. Professor Graham has already shown with regard to taste, that a certain class of mineral substances (the sesquioxides of the metals), can be placed in a class as sapid substances, viz., as sweet; possibly odorous substances may be capable of classification in a similar way as fragrant, fœtid, aromatic, &c., according to their chemical constitution. At present the only attempts at classification of odours have been based on conjecture or the merest fancy, and have been utterly useless for scientific purposes.

A theory entirely opposed to that of Professor Graham, which may be called the chemical theory of olfaction, is that propounded by Dr. William Ogle, who has suggested the idea that odorous impressions may be the result of vibrations, basing his views on the fact that pigment is present in the olfactory region, and that this pigment is essential to perfect olfaction. Admitting Dr. Draper's views as to the absorption of luminous vibrations

by the choroidal pigment to be correct, may not a similar function, he asks, attach to the pigment of the nose and ear? (*Medico-Chirurgical Transactions*, vol. liii, pp. 289 and 290.) It is reserved for future physiologists to solve this difficult problem.

A classification of odours based upon the chemical qualities of odorous matters, offers a prospect of overcoming the great difficulty which metaphysical classifications will always present. Whether an odour be agreeable or offensive will depend upon individual idiosyncrasies, and these are often the result of the association of ideas. An odour that may be agreeable to most persons, may from some accidental association of ideas in an individual affected by it, be most repulsive to that individual. The child who has been cajoled into taking medicines by the pleasant odour of some aromatic vehicle will henceforth have a special aversion to that particular scent. So a perfume may become repulsive from the circumstance of its having been used by a person, whose character or appearance is disagreeable to us from some other cause, the two ideas of the scent and the repulsive person being on all future occasions indissolubly connected.

The essential conditions for olfaction are the following:—

1. The odoriferous matter must be conveyed to the olfactory region.

Numerous experiments show that no sense of smell is excited by the presence of highly odorous vapours in the sinuses leading to the nostrils, the olfactory region being artificially excluded, nor in the cavity of the nostrils when the olfactory nerves have been destroyed.

2. The mucous membrane of the olfactory region must not be too dry.

3. The mucous membrane of this region must not be too moist.

4. In mammalia and birds, and probably in reptiles, the odorous matter must be brought to the olfactory region in a state of vapour, or at least in a state of very fine powder. In *fishes* the sense of smell is exercised upon substances dissolved

in water. In their case, therefore, the only apparent difference between smell and taste is that the mechanical and vital apparatus of the two functions are situated in different regions.* And it is remarkable that in fishes only the cavity of the nostrils is separate from that of the mouth and pharynx. This peculiar arrangement is no doubt due to the necessity for preserving the more delicate mucous membrane of the olfactory region from the injurious influence of a constant stream of water through the nasal passages, which would be inevitable if in the gill-bearing animals the respiratory passages were continuous with the nostrils, as in air-breathing animals. It is also not improbable that the delicacy and softness of the olfactory region is an essential quality upon which depends its adaptability to the detection of differences in the odorous qualities of *organic* matter; and that this delicacy would be imperilled or rendered impossible by the constant exposure to a *stream* of water, often, as in the case of marine fishes, loaded with saline matter and foreign particles of all shapes and sizes.

5. The *nutrition* of the mucous membrane of the nostrils generally, and of the olfactory region in particular, must be good. Various circumstances, such as inflammation, catarrhal swelling, or excessive secretion of mucus, will interfere more or less with the perfection of the sense, and the excessive dryness of this region, in cases of injury or disease of the fifth pair, leads to a greatly diminished *acuteness of smell,* as well as to a total loss of *sensibility to irritants,* such as pungent vapours, snuffs, &c.

6. In animals, living in air, the sense of smell is rendered

* The odorous matters are contained in the water; but in what form—whether dissolved in the same manner as the gases absorbed by water—is uncertain. The solution of these matters in water is clearly no reason for denying the sense of smell to fishes, or for placing the sense of taste in their nares; for the essential characteristic of the sense of smell consists, not in the gaseous nature of the odours, but in the special sensibility of certain nerves, and in its difference from the sensibility with which the nerves of taste are endured. The matters of odours also must in all cases be dissolved in the mucus of the mucous membrane before they can affect the olfactory nerves, and their state in the mucus must be the same as that in which they are contained in water.—"Müller's Physiology of the Senses," p. 1312.

more acute by rapid *movement* of the odorous emanations across the sentient surface, and some amount of movement of the odorous matter is essential to the production of a sense of smell.

7. *Warmth* favours the impression of scent. This is probably due to the increased rapidity of the *volatilization* of the odorous matter.

Next, considered as a part of the *respiratory apparatus*, the nostrils offer in the first place a double aperture for the admission of air, and the nasal cavities present several different structural peculiarities, evidently designed to ensure the admission of air suitable for respiration, and to prevent the admission of gases or pulverised solids into the lungs and air passages:—*a*. The vibrissæ, or fine hairs, at the entrance of the nostrils catch all the coarser particles floating in the air. *b*. The moist and sensitive ciliated mucous membrane catches any finer particles, and by the secretion of mucus entangles them and ultimately extrudes them. *c*. Irritant gases or vapours excite the nutritional and sensory nerves of the ciliated region, and sneezing and a flow of sero-mucus are at once set up, the pain and irritation at the same time exciting voluntary efforts against the further respiration of the offending gas. *d*. The sense of smell placed in the direct current of inspiration warns us against gases or air tainted with foul or putrescent odours, and so likely to be injurious to the whole system as well as the lungs. *e*. The great extent and complexity of the mucous surface, largely supplied with freely anastomosing blood vessels, warms and moistens the inspired air.

Thirdly. The nose may be regarded as part of the *mechanism of expression*. And in this aspect we note that its frame work is partly bony and immovable, viz., that formed by the nasal bones, the vomer, the perpendicular plate of the ethmoid, and nasal processes of the superior maxillary bones, and partly cartilaginous and movable, viz., that formed by the superior lateral, lower lateral, and sesamoid cartilages at the sides and by the septal cartilage internally. Though, however, the upper

bony portion of the framework is immovable, the skin covering it is capable of some amount of motion, and is actually moved by the subcutaneous muscles, and thus the whole external organ is a very important part of the organ of expression.

The muscles are the *pyramidales nasi*, continuous with the fibres of the *occipito frontalis*, and descending on either side to become blended by a tendinous expression with the *compressor naris;* the latter being a small thin triangular muscle arising by its apex from the superior maxillary bone (a little above and external to the *incisive* fossa), and inserted into a thin aponeurosis which is attached to the fibro-cartilage of the nose, and continuous on the bridge of the nose with the muscle of the opposite side.

The levator labii superioris alæque nasi, the dilatator naris posterior, the dilatator naris anterior, the depressor alæ nasi, and the compressor narium minor, are all described in detail in anatomical works. All these muscles are supplied by the facial nerve.

The *skin of the nose* is thin, and loosely connected with the subjacent parts on the dorsum and sides, but is thicker and more firmly adherent at the tip and lobes and alæ. It is furnished with a large number of sebaceous follicles, especially at the furrow between the alæ and cheek, and along the curved outline of the alæ. As the skin passes into the interior of the nostrils, it becomes thinner and furnished with numerous hairs (vibrissæ); as it advances into the nostrils proper it loses its cuticular epithelium, and becomes covered with soft, ciliated mucous cells, at the same time also losing its cutis vera and subcutaneous areolar tissue.

Even viewed as an organ of expression, the sense-organ cannot be disregarded. We see in the characteristic expression of disgust (without perhaps any physical cause for the mental attitude) the habitual movements by which a foul or offensive odour is repelled. The mouth is closed, the nostrils expanded and the alæ raised, and an expiratory effort is made, as if to thrust from the olfactory region the offending odour. In animals

(especially in those gifted with highly-organized olfactory organs, *e.g.*, the dog, and other hunting carnivora) the nostrils, when raised and expanded, indicate attention and vigilance. So, too, in man, the connection between the respiratory function and the nostrils leads to a habitual movement of the latter, associated with a mental condition primarily affecting the thoracic viscera, but finding its expression partly in the face. Anxiety and expectation quicken the breathing and the heart's action, the nostrils rapidly expand and contract, for the purpose of admitting as full a stream of air as possible. Thus an expression of anxiety and expectation is depicted on the countenance, involuntarily, automatically, and as a consequence of the associated movements of the nostrils, as part of the respiratory apparatus, with those of the more essential parts of the same apparatus.

Fourthly. The nasal fossæ and sinuses have an important effect on the tone (*timbre*) of the *voice*. If the voice passes unobstructed through the nasal cavities it has the ordinary or normal tone, but if the posterior nares are cut off from the pharynx by voluntary raising, firm closing of the soft palate, or by swelling of the parts, a peculiar modification of the voice is produced, and M. Lespagnol* seems to have proved that ventriloquists produce their peculiar effects by a forcible closing of the posterior nares by elevating and fixing the soft palate against the back of the pharynx. The reverberation of the vocal sounds in the sinuses seems to have a somewhat analogous effect to that produced by the fossæ of the os hyoides in the howling monkeys (Cebus Seniculus and Cebus Beelzebut).

The effect on the voice of partial obstructions of the posterior nares is well known in ordinary catarrh, in which there is a peculiar thickness in the articulation ; and the sounds of *m* and *n* are specially altered into the sounds *b* and *d* : thus, *nose* is *doze* and *music* is converted into *boozic*. The same kind of thickness and indistinctness of utterance is observed in a certain affection of the naso-pharyngeal cavity, described as *adenoid vegetations* by

* Lespagnol, "Dissertation sur l'Engastrinisme," Paris, 1811.

Dr. Wilhelm Meyer (see the *Medico-Chirurgical Transactions*, vol. liii, p. 191 et seq.), a disease very common in Denmark.

Polypi and tumours in the same region cause a similar alteration of the vocal sounds, and these modifications of the voice are thus important aids to diagnosis in such affections, as will be hereafter seen.

Besides the four different functions of the nose already considered, a fifth subsidiary and incidental one is the modification of sound conveyed from the mouth to the ear, due to the intervention of spaces and cells containing air between the teeth and the auditory apparatus; and also the diminution of shock and vibration on the brain during mastication, due to the same arrangement.

It is probable that if the teeth were set in a perfectly solid upper jaw, with no cellular spaces or sinuses, and that this solid bone were continuous with the base of the skull, and therefore communicating every noise and vibration to the auditory apparatus and to the brain itself, the noise heard in mastication would be intolerable, and the brain would be constantly exposed to injurious disturbance. A fair idea of the difference as regards the power of communicating sound between solid and cellular bones may be formed by plugging the ears with cotton wool, and placing a watch first on the squamous portion of temporal bone, and then on the outside of the antrum. In the latter position the ticking of the watch is scarcely heard, whereas in the former it is remarkably distinct. The cavity of the antrum effectually cuts off the sound, whereas the dense bone of the temporal conducts it perfectly. Placed between the teeth, the watch is heard as distinctly as over the temporal bone; but this is not a fair way of comparing the two methods of conduction, because, in the case of the teeth, there is no intervening soft substance between the sound-producing body and the bone, whereas the temporal region presents the skin and muscles as obstacles to the transmission of sound.

The Vital Properties of the Nasal Fossæ.

The vital properties of the nasal fossæ direct their actions and regulate them even in the conditions of disease. Sensitiveness is a vital property of the nasal fossæ under three forms:—

1. Nutritive sensitiveness, or reflex irritability. This is the property of all organs and parts of the body, but it is more developed in the mucous membranes of the eye, nose, mouth, and the secreting glands than in the general surface.

2. Common sensation, or tactile sensibility. The nasal cavities possess this in common with the surface of the skin, but probably in a less degree than the lips, tongue, and hands, but have sufficient acuteness of sensation to resent the intrusion of foreign bodies or irritant gases.

3. Special sensation, viz., smell; this property being confined to the olfactory region already described.

By virtue of nutritive sensitiveness, a secretion of lymphoid or mucous fluid constantly lubricates and moistens the surfaces and cavities of the nasal fossæ, and thus renders them fit for the reception of odorous impression. In the normal condition the liquid exhaled is diffused as vapour in the air traversing the nasal passages, and is so carried away by it that it would at first sight appear to be altogether absent; but if any irritation is set up in the nostrils, as for instance by plugging them with lint, or *charpie*, or by taking snuff, the liquid increases rapidly, and soon runs down in a stream if the irritant cause is persistent.

The discomfort occasioned by excessive dryness of the nostrils, whether produced by a sharp attack of inflammation, or by rapidly inspiring cold dry air, is a sufficient demonstration of the utility of the secretion of fluid as it exists in health. On the other hand, impaired function is produced by an excessive secretion of moisture, as in the case of common catarrh, in which it is probable that the ends of the nerve fibres, which in the normal condition come into actual contact with the odorous particles, are so bathed in moisture that olfaction is rendered impossible. The altered character of the secretion in catarrh and in the

different forms of coryza gives rise to much irritation of the mucous membrane and the skin of the aperture of the nostrils, but the true cause of this changed condition is not yet sufficiently demonstrated.

The mucous glands in the pituitary membrane exude a stringy, transparent, and inodorous fluid; this becomes thicker on exposure to the air, and if not got rid of by blowing the nose, as when secreted in rather large quantity during the night, becomes hard, and often dries into the form of crusts, moulded upon the surfaces whence they have been secreted.

The Development of the Nose.

The external nose in the fœtus, and in children, is much less prominent and more flattened out than in the adult, and, in consequence of the absence of the frontal eminences and sinuses, it forms with the forehead a much more acute angle: the depressed line, in the profile of the infant, being replaced in the adult by a more or less prominent one.

The nasal fossæ are relatively smaller in size, and much less complex than in the adult, and the whole olfactory apparatus is later in coming to maturity than the senses of hearing and sight; their vertical diameter is remarkably small, the sinuses being not yet formed, and the lateral masses of the ethmoid being still cartilaginous. The cribriform plate of the ethmoid, at birth, is a mere membranous plate continuous with the falx cerebri of the dura mater, and attached behind to the partially ossified body of the sphenoid. The vertical plate of the ethmoid is cartilaginous at this period, but the vomer is already ossified; some months after birth the nasal fossæ extend in all their diameters, and the different sinuses are developed. At the age of two years the frontal sinuses and ethmoidal cells have begun to form, and the hollowing out of the antrum Highmorianum goes on simultaneously. The antra appear as cavities at an earlier period than any other of the sinuses, the development commencing about the fourth month of fœtal life, and at birth have a rounded form, which later on becomes irregularly pyramidal.

In a fœtus at about the seventh month of gestation, though there were no traces of the ethmoidal or sphenoidal or frontal cells, the antrum was large enough to hold a split pea, but had its walls in contact nearly in its whole extent. Its cavity therefore presented a flattened irregularly ovoid shape. The greater part of the upper maxillary bones was at this time cartilaginous in this fœtus, and the cribriform plate of the ethmoid and its vertical plate were also cartilaginous. The sphenoidal cells are the latest to make their appearance, and are often not yet formed at the period of birth.

It is obvious that this late development of the central portions of the base of the skull provides in the first place for a certain amount of mobility in the bones during parturition, and especially in the antero-posterior or long diameter, but also to a certain extent transversely; so that the head in the course of its passage through the maternal structures is compressed laterally and in an antero-posterior direction, and elongated vertically without injury to the parts. This would be impossible if the parts were perfectly rigid. The partially cartilaginous condition of the ethmoid and sphenoid has the effect of a hinge upon which the parietals and frontals move laterally, and the occipitals and frontals in the opposite direction. A second object attained by this flexible and compressible condition is, that the alteration of bulk of the surrounding bones and cavities in the process of growth, can go on without any rigid impediment in the centre, and the full development of the soft tissues, and especially of the nerves, is possible without the risk of compression by the encroachment of bony deposits on the channels for their transmission.

On the other hand, it is probable that the late development of the bones in this region occasionally favours the formation of tumours and outgrowths in the nasal and orbital cavities, and that some of the malformations of the face are due to arrest of development of these parts during fœtal life.

SECTION II.

Preliminary Remarks on Rhinoscopy, Anterior and Posterior.

Non-Ulcerative Affections of the Nasal Fossæ.

Subsection 1. Catarrh of the Nostrils.

„ 2. Strumous Rhinorrhœa, or Coryza.

„ 3. Syphilitic Coryza, depending upon Mucous Tubercles.

„ 4. Epistaxis.

„ 5. Cysts.

„ 6. Rhinolithes, or Nasal Calculi.

„ 7 (*a*). Naso-Palatine Gland Disease.

„ (*b*). Adenoid Vegetations of the Naso-Pharyngeal Cavity.

„ 8. Gelatinous Polypi.

SECTION II.

Preliminary Remarks on Rhinoscopy, Anterior and Posterior.

Anterior Rhinoscopy.—For the purpose of obtaining a good view of the anterior region of the nasal cavities, it is necessary—

1. To have a good light, and, of all others, sunlight is incomparably the best. This being too often unattainable, we must content ourselves with concentrated light from the sky, or a white passing cloud, using a lens of about 4-inch focus for this purpose; or we must use an Argand gas-burner with a condenser; or a good paraffin lamp with the same arrangement.

Dr. Thudichum's medical lantern is a most desirable means of illuminating this region. It is thus described in the *Medical Times* (for Aug. 22, 1868): "A small lantern carries the arrangements which are necessary for the production of the spirit-oxygen lime-light. The glass spirit-lamp is screwed into the bottom of the lantern, in order that the level of the spirit may be always accessible to the eye. The rest of the arrangements, including an annular ditch round the burner, to be filled with water intended to cool the burner, are inside the lantern. The oxygen is supplied from an iron bottle underneath the lantern, in which it is contained under pressure," &c., &c.

If the gas-burner or the paraffin lamp is used, it should have a metallic chimney, into which a bull's-eye condenser is fitted; and the light thus obtained is generally sufficient for all the purposes required, either in anterior or posterior rhinoscopy.

2. We require some method of expanding the aperture of the nostrils, in order to allow the light to penetrate as far as possible into their cavity, and to enable the observer to see into them a

corresponding distance. For viewing the more superficial parts it is only necessary for the patient, who sits facing the light, to throw his head well back, and the surgeon to expand the ala by placing a finger or thumb on the tip of the patient's nose, and pushing it gently upwards, and from side to side, according to the part it is desired to examine.

But in many cases the aperture is so narrow, and the parts so swollen, that this plan does not enable us to see clearly beyond the immediate entrance; and some form of speculum is necessary to dilate and illuminate the cavity. In the celebrated lectures on Surgical Operations, by Dionis, a form of nasal speculum is figured, which resembles in shape a very rudely-fashioned pair of sugar-tongs, the two limbs of the tongs being kept asunder by the spring of the arch uniting them; so that to introduce them into the nostril the limbs were pressed together, and when introduced they were released, and remained *in situ* by their own elasticity, at the same time expanding the parts. An instrument (Dr. Thudichum's) constructed on the same principle, but made with smooth flat polished blades, is in present use, and has the advantage of that described by Dionis of being self-retentive when introduced. The same advantage is enjoyed by Fränkel's speculum, of which the illustration (fig. 4*a*) will at once explain the mechanism. It answers better than any other with which I am acquainted, for the purpose of expanding the nostrils without causing unnecessary pain or discomfort, and it occupies less room than any other form. If it be desired to throw reflected light from one side of the cavity to the deeper parts, a concave single-bladed instrument, such as the one made for me by Messrs. Krohne and Sesemann (see fig. 5), answers exceedingly well; and the flat handle is available as a tongue-spatula. Dr. Metz's speculum consists of two flat blades intended to be introduced separately, but not self-retentive. The disadvantage of this method is, that during the examination both hands are occupied in managing

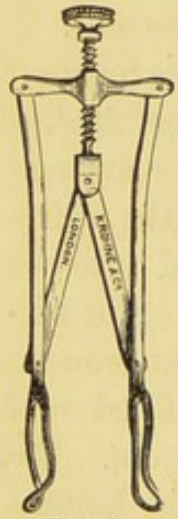


Fig. 4*a*.

the speculum, and neither therefore is available for any necessary manipulation. The flat surfaces of the blades, too, are not so well adapted for throwing a concentrated light by reflexion into the deeper parts of the cavity. In passing any speculum into the anterior nares, it is well to avoid touching the delicate mucous surface of the inferior turbinated bone, as it very easily bleeds and is extremely sensitive, so that the patient shrinks from the contact of the instrument, and, unless he is possessed of great self-control, will be unable to bear the discomfort and pain attending an examination, especially if Fränkel's expanding speculum, or any other expanding instrument be used. Nothing is to be gained by thrusting the expanding speculum beyond the cartilaginous expansile portion of the nostrils; but if a Metz's speculum be used, it may be passed some distance along the floor or septum, and may so illuminate the outer wall of the nasal fossa, though by this method very little expansion of the aperture is attainable.



Fig. 5.

3. It is necessary that the parts to be examined should be free from secretions or discharge of any kind. Hence it is often desirable to use the syringe or nasal douche (fig. 4*b*) before attempting to examine the nostrils. Slightly warm water, with a little common salt in it, is less irritating as a douche than pure water, especially if the temperature of the latter be below 60°. If there be a bleeding surface that requires examination, of course cold, or even ice-cold water will be required, and then the parts may be further cleansed by passing up a pledget of lint soaked in alum solution, or some other astringent. The simplest form of douche is that known as the syphon douche (fig. 4*b*). The nozzle is made of vulcanite, and is perforated with 8 or 12 holes. It should be made to fit the nostril exactly. The syphon end of the tube is placed in a jug or basin of water at some height above the patient's head, and the water is then

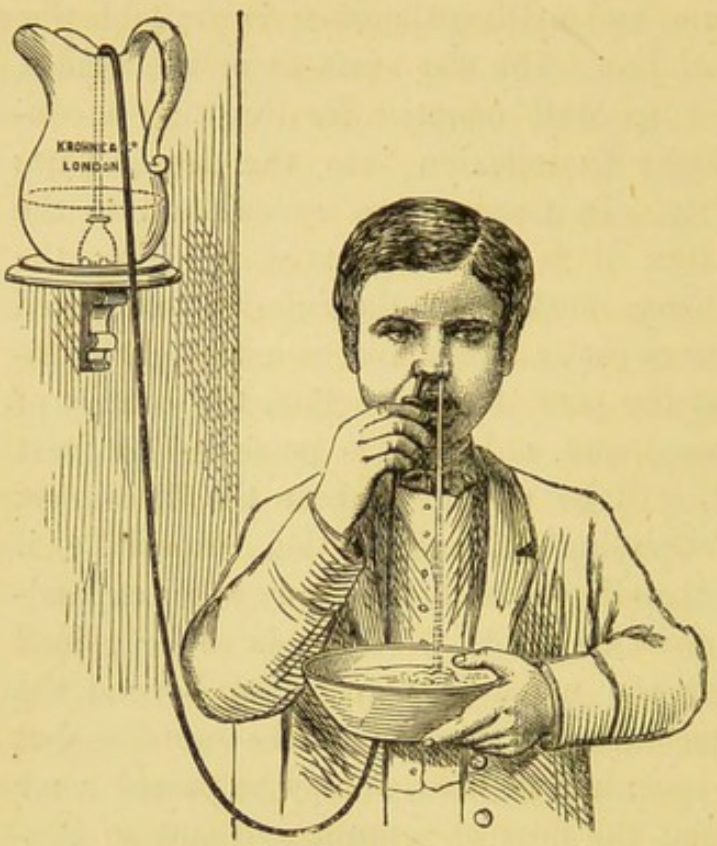


Fig. 4*b*.

drawn down by suction into the nozzle. The water will then continue to flow until the jug is emptied, and the force of the stream can be varied by varying the height at which the jug is placed. If the patient be instructed to keep his mouth open, and breathe entirely through his mouth, the stream of water will find its way from one nostril to the other without passing down the pharynx, and the two nostrils will thus be subject to a continuous cleansing stream. If desired, the current can be reversed by putting the nozzle into the opposite nostril, and allowing the water to escape by the one through which it at first entered.*

* "Some years ago it was discovered by Professor Weber of Halle, that when the side of the nasal cavity is entirely filled through one nostril with fluid by hydrostatic pressure, while the patient is breathing through the mouth, *the soft palate completely closes the choanæ, and does not permit any fluid to pass into the pharynx*, while the fluid easily passes into the other cavity, mostly round and over the posterior edge of the septum narium, and escapes from the other open nostril, after having touched every part of the first half of the cavity of the nose, and a great part—certainly the lower and median canals—of the second half." —Thudichum on "Polypus of the Nose and Ozæna," p. 17 (Churchill, 1869).

Any one who possesses an india-rubber enema-syringe (Higginson's) can very easily convert it into a most efficient nasal douche by having one of the douche (vulcanite or glass) nozzles fitted to it, instead of the anal pipe. For many cases it will only be necessary to use an ordinary syringe to the front part of the nasal fossæ, and in some cases the mere use of the pocket-handkerchief will be all that is necessary to cleanse the parts sufficiently for examination. Under favourable circumstances, the healthy mucous membrane can be seen directly backwards for a distance of an inch and a half or two inches, the smooth, flat surface of the septum on the inside, and the rounded surface of the anterior part of the inferior turbinated bone and the inferior meatus on the outside, all the surfaces being of an uniform rosy tint, and with a slightly moist surface.

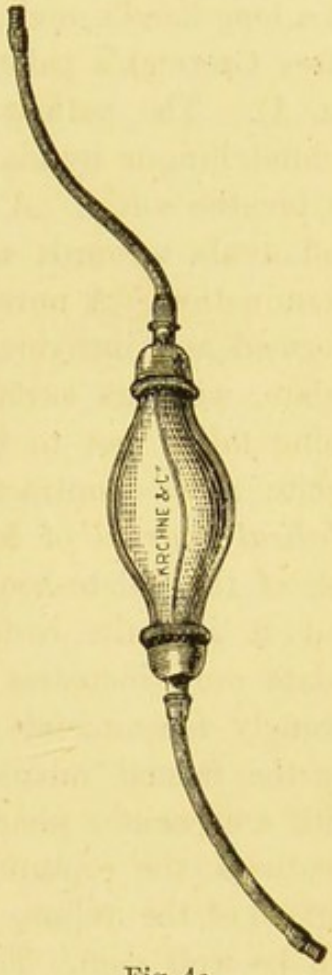


Fig. 4c.

The extent of mucous membrane visible from the front varies very much, according to the capacity of the nasal fossæ. Czermak states that in one instance, in which the nasal cavity was very capacious, he succeeded in getting a view of the posterior part of the pharyngo-nasal cavity. The inferior turbinated bone and the inferior meatus are, in ordinary cases, visible to the depth of one-third of an inch from the orifice, and a much larger portion of the septum comes easily into view.

By concentrating a strong light on the outside of the nose the interior is dimly lighted in consequence of the translucency of the tissues, and it is possible, under very favourable circumstances, to get a tolerably good view of the nasal fossæ by this means. But this method is inconvenient in practice, and uncertain in its application.

For *posterior rhinoscopy* it is necessary to have an equally

good light as for the front region, and besides this we must have the well-known laryngoscope mirror, a faucial mirror set in a long handle, and a rectangular tongue depressor. In certain cases Czermak's palate-hook will also be required (see Plate I, fig. 1). The patient is placed sitting, with the light either behind him or by his side, and his head erect. He is directed to breathe softly. A forcible inspiration draws the soft palate and uvula upwards and backwards, and so interferes with the examination. A mirror about the size of a threepenny-piece is warmed and introduced by the side of the uvula, beneath the palate, with its surface directed upwards and forwards, care being taken not to touch the soft palate or uvula so as to excite reflex contraction of those parts. (See the *British Medical Journal* of May, 1874.) Dr. Johnson objects to the use of the palate-hook, as recommended at first by Czermak, and it is quite certain that anything that touches the soft palate only increases the difficulty of the examination. He strongly recommends the tongue-spatula, using it as a guide for the faucial mirror. Under favourable circumstances, and with a capacious pharynx, the turbinated bones, the two upper meatuses, the septum, the roof of the pharynx, the posterior surface of the velum, and the orifices of the Eustachian tubes, can be well seen. The superior turbinated bone is often only seen indistinctly. According to Czermak, it is sometimes possible to see the posterior aspect of the nasal bones and the under surface of the lamina cribrosa (the view being taken parallel with the septum), when the nasal fossæ are very capacious.

To those who are not accustomed to the use of the rhinoscope, a good idea of the anatomical relations of the posterior nares and their general appearance is gained from the figure (Plate I, fig. 2) taken from a view illustrating Professor Czermak's treatise (New Sydenham Society's Translation, p. 77). It is not often that much information as to nasal disease is obtainable by the use of the laryngoscope, but when it is available the advantages derived from it are very great and

striking. (See case by Dr. George Johnson, in Appendix, Case No. I.)

All authorities are agreed that posterior rhinoscopy presents very great difficulties, but that in a number of cases great skill, patience, and judgment on the part of the surgeon, with a corresponding amount of patience and self-control on the part of the patient, will enable us to examine this region with great advantage as an aid to diagnosis, treatment, and the ascertaining of the results of treatment.

Where, however, only imperfect views of the parts have been obtained, we may often supplement the information thus obtained by a digital exploration, and the result of the two methods combined will be much more satisfactory than that obtained by either of them alone.

The great desideratum for the more easy application of this method is a safe and efficient local anæsthetic. Bromide of potassium and ammonium locally applied and given internally were at one time supposed to have a specific influence over the soft palate and pharyngeal muscles, but subsequent experience has not justified the sanguine anticipation once held as to their usefulness. The application of cold, by means of ice allowed to remain in contact with the velum and root of the tongue for as long a time as it can be borne by the patient, and, in fact, until it melts and is swallowed, offers the best means at present within our reach for diminishing the irritability of the part.

Much, however, in obstinate cases, may be done by education. Touching the velum with the palate-hook of Czermak, if repeated, may at last be borne without any difficulty, and the patient may be instructed to practise with the finger or the handle of a tooth-brush, daily or two or three times a-day, in accustoming the parts to the sensation of the presence of a foreign body in the throat without swallowing, or attempting to swallow, and thus getting him accustomed to the exercise of an unnatural self-control.

In cases in which the tongue is large or uncontrollable, it will be necessary to get the patient to keep it well down in the

mouth, and if not able to do this without the spatula, he must be taught to hold the spatula down himself after it has been put into position for him.

If the pharynx be narrow and the velum have a tendency to fall back against it, it is very difficult to get a view of the posterior nares. By great care in education, and perhaps by using Czermak's palate-hook, the difficulties may be at length overcome; but in such a case it is well to warn the patient beforehand that the throat is very unfavourably formed by nature for an examination, and that he must call up all his stock of patience for the attainment of the desired result. If told to breathe through the nose, as if snoring, the soft palate is necessarily withdrawn from the pharynx, and it will then be possible to ascertain what distance is really available for rhinoscopic purposes.

Subsection 1.—*Nasal Catarrh: its Pathology, Causes, Symptoms, and Treatment.*

The first stage of catarrh in the mucous membrane of this, as of all other regions, is that of *hyperæmia*. The perifollicular blood-vessels become congested and the adjacent tissues swollen by increased flow of blood. This is followed by hypersecretion of the follicular glands, and the result is a *lymphadenitis*. The secretion, at first mucous in character, soon assumes a suppurative form, and a *suppurative follicular lymphadenitis* is thus induced.

Causes.—Cold applied to the surface is the cause commonly given for "catching cold." This cause alone, however, is obviously insufficient in a healthy condition of the system. The *circulation* must be *feeble* in the individual who suffers, and the *nervous tone* lowered by insufficient or faulty nutrition. It is impossible, without taking into account the different vitality of different individuals, to account for the fact that persons exposed to the same atmospheric conditions will be affected so differently as we commonly observe them to be. Ill-fed children and delicate women will suffer severely from this troublesome and

common affection, while healthy and robust adults entirely escape. The lowered vitality of the former renders them unequal to the effort of equalising the circulation in the part irritated, and the consequent congestion and inflammatory swelling of the mucous membrane is the result.

To the irritant effect of cold there is often superadded another source of irritation, viz., the suspension in the atmosphere of foreign particles of soot and foul gases: and hence the frequency of catarrh in the London fogs so prevalent during the autumn and winter. The closely-allied condition, *epidemic catarrh* or *influenza*, is attributed to altered states of the atmosphere, whether from excessive proportion of ozone or from some low organisms of a vegetable kind. But the excessive and early nervous prostration in this form of catarrh points to a much more general blood-poisoning of the system than in the simple form. Nevertheless, it is probable that common sporadic catarrh may be due to the absorption of a small dose of the same kind of poison which in a larger dose and more widely spread might give rise to an epidemic of influenza.

While, however, the common catarrh partakes of the character of influenza, it also resembles another form of nasal catarrh, viz., hay-fever, and as this latter affection has been almost demonstrated to depend upon the presence of low vibrio-like* organisms in the nasal mucous membranes, we have, in this circumstance, another reason for supposing that some similar cause is in operation in the production of the similar train of effects here observed.

Chemists and druggists find that the inhalation of chlorine vapour produces nasal catarrh very rapidly, and Professor Schönbein was affected in the same way by inhaling ozone. Any irritant, such as common snuff, will produce similar temporary catarrh, and it is easy to conceive that a continuous irritation, as from breathing damp fog loaded with minute particles of coal dust, soot, and irritant products of combustion will produce a lasting impression, and give rise secondarily to

* See Professor Binz on Hay Fever, *Practitioner*, April 1874, p. 269, et seq.

the constitutional disturbances associated with the local inflammation.

According to M. Cloquet ("Osphrésiologie," p. 601), the most common determining cause of this affection is coldness and rawness of the atmosphere and sudden changes from warm to cold air. "Nothing," he says, "is more evident at Paris and London, where the temperature is most variable."

Dampness and cold applied to the feet are also supposed to have a peculiar influence in producing ordinary catarrh.

Symptoms.—The subjective symptoms of catarrh are well known: a general feeling of lassitude, with aching of the limbs and back, and perhaps violent sneezing, is soon followed by a sense of stiffness and obstruction in the nostrils and region of the frontal sinuses; the sense of smell is impaired, and taste suffers at the same time; then follow coryza and the associated use of the pocket handkerchief. The disinclination for exertion and feeling of *malaise* are now greater than before. Occasionally an eruption of herpes appears on the upper lip, about the third or fourth day after the commencement of the fever. The skin having from the first been dry, after the first day or two becomes abnormally hot. Thirst and loss of appetite are generally associated with this train of symptoms. If the discharge from the nostrils continue unchecked, it assumes a more tenacious consistence and yellow colour, as if from admixture of pus with the ordinary mucus. At this stage there is greatly increased debility, and the nose and eyelids and adjacent parts become much swollen, and the eyes appear congested and have an overflow of lachrymal secretion.

The secretion during a catarrh being at first thinner than the healthy mucus, of course contains a larger proportion of water during the early stages of the complaint; later on it becomes thicker, in consequence of the increase in the number of mucus corpuscles. The reaction is alkaline, and generally more strongly so than in health; the fat is increased and contains cholesterin, and there is an excess of albumen.

The following analysis of nasal mucus, in a man æt. thirty

years, is given by Dr. F. Simon. It came away in the form of thick, tough yellow lumps, and was only discharged from one nostril. It was devoid of odour, alkaline, and, moistened with water, exhibited an extraordinary number of epithelial and a few mucous cells, connected by a pretty thick membrane of coagulated mucus. In 1,000 parts:—

Water	880·0
Solid constituents	120·0
Fat containing cholesterin . .	6·0
Gaseous matter, with pyin or mucin in solution	13·2
Extractive matters with lactates and chloride of sodium . . .	12·0
Albumen, cells, and coagulated mucus	84·0

The clinical features of the case, from which the above analysis was derived, point to a somewhat peculiar condition, and are not those of an ordinary catarrh, but the increased proportion of fat and albumen and the increased alkalinity have been observed in the mucus of catarrh of the common kind. Gruby and Simon have observed in nasal mucus during a common cold, "large cells, which had eight times the diameter of blood corpuscles, consisting of a delicate transparent capsule and an inner round cell with a nucleus twice as large as a blood corpuscle." These were found in the gray or yellow streaked gelatinous mucus from the air passages and the nostrils.*

* These large cells are probably epithelial cells that have undergone "*mucous metamorphosis of the protoplasm*," and have become detached from their epithelial bed by the stream of catarrhal mucus before their contained mucus corpuscles have become fully developed and have escaped from the parent cell.

Rindfleisch is of opinion that the mucus in mucous catarrhs is not exclusively secreted by the acinous mucous glands, but that it is in great part due to the "mucous metamorphosis of the protoplasm" of the epithelial cells; and hence we may have mucous catarrh, and find mucoid elements in the secretions of mucous membranes which, like that of the bladder, are destitute of glands.

In reference to the appearance of pus cells, Rindfleisch assumes that the mother-cells found in the epithelial layers of mucous membranes during catarrh were formed by endogenous segregation of the protoplasm, and subsequently turned out their broods as pus cells. But it has not been proved that the mother-

In very severe catarrhs with some amount of inflammation of the mucosa, the mucus has a yellowish colour and loses its transparency, or has its transparency mottled or streaked with lines or masses of a yellow colour. This is due to an admixture of pus with the mucus; but the microscopic features of this modified mucus are not materially different from those of healthy or catarrhal mucus, the pus corpuscle being very similar to the mucus corpuscle, and behaving in a similar way with reagents.*

cells are always found on catarrhal mucous membranes; and hence Billroth inclines to the view that catarrhal pus has the same origin as other pus, viz., that it comes from the blood (see Billroth's "General Surgical Pathology," translated by C. E. Hackley, p. 266); and that the white blood-cells escape from the vessels of the inflamed mucous membrane, pass through the epithelium, and so appear in the secretion as pus cells.

As a proof, however, to the contrary, "at a recent meeting of the Société de Biologie, M. Ranvier stated that on examining with the microscope the fluid discharged from the nose at the commencement of coryza, he found that it contained a large quantity of cellular elements, some of cylindro-conical form with a flat surface crowned with cilia, others strongly granular and turgid, in which the flattened surface and cilia had disappeared. Rindfleisch was of opinion that these cells were white corpuscles covered with cilia. It was of great importance to determine if these were really leucocytes, or only deformed epithelial elements. On warming them, some of the cilia could be seen to recommence their movements, but no amœboid motions were observed. They are, therefore, *not* white corpuscles of the blood. M. Ranvier has been still more satisfied of this, after examining them in iodised serum. The use of the amniotic liquid of the sheep, highly iodised, enabled him to recognise the fact, in conformity with the statements of M. Bernard, that the white corpuscles of the blood, or the lymph corpuscles, contained considerable quantities of glycogen. In fact, when leucocytes are immersed in iodised serum, they may be seen to acquire a characteristic violet-brown colour. But the cells with vibratile cilia met with in the mucus of coryza, though assuming, indeed, a yellowish tint under the influence of iodised serum, do not give the peculiar reaction of glycogen. It would hence appear to be clearly made out that these are not young elements proceeding from the blood, but that they are the epithelial cells of the mucus."—*Lancet*, January 20th, 1874.

* It is probable that the corpuscles known as *mucus corpuscles* are identical with pus corpuscles, not only in microscopic characters, but in chemical composition. Rindfleisch recognises only two varieties of catarrh, *epithelial* and *purulent*, "according as epithelial cells or pus corpuscles *predominate* in the secretion. I say *predominate*, since both are usually present together. A catarrh exclusively epithelial may be seen on the mucous lining of the tongue, the '*fur*' being nothing more than an exuberant desquamation of pavement epithelia."

If any *considerable* quantity of pus is mixed with the mucus, it may be detected by the tests for albumen; the liquor puris containing a much larger proportion of albumen than ordinary mucus, and therefore giving much more decided evidence of its presence on the addition of nitric acid or the employment of the ebullition test.

Nothing very satisfactory has been made out as to the chemical changes in nasal mucus, to which its irritating qualities are attributable. We sometimes find in the course of a catarrh that the upper lip and margins of the nostrils become reddened and excoriated. This may be partly due to an extension of the hyperæmia and swelling of the mucous to the cuticular membrane, but it is probably due in part to some irritating quality in the secretion. The increased alkalinity alone would seem hardly sufficient to account for this, and it is probable that it undergoes some other changes, with the nature of which we are as yet unacquainted. If the discharge has continued for a long period, it will become fœtid and offensive in many persons, and in a few it will have this character from the first; thus constituting what is termed simple or *accidental ozæna;* but the odour in these cases is very different from that in constitutional ozæna.

In the scrofulous, this long-continued discharge may be succeeded or acccompanied by superficial excoriations of the margins of the nostrils and the upper lip, and both these parts become swollen and red. The adjacent parts of the cheeks, too, are often irritated by the flow of the foul discharge, and an eczematous eruption may then make its appearance, and not yield to treatment till the disease in the nostrils has subsided. As a rule, however, in healthy persons this malady ceases in a period varying froma few days to a fortnight, the swelling of the mucous membrane subsides, the discharge ceases, and a healthy condition is restored.

Treatment.—That "the physician cannot cure a common cold," has often been cast in the teeth of our profession as a reproach to medicine; probably the chief reason being that few

people will submit to the restraint and regimen necessary for cure, and very few place themselves under medical treatment at all for what is often considered a trivial, if a troublesome, ailment. There is, nevertheless, some aid afforded by the judicious use of warmth, quietude, careful dieting, and sudorific medicines. In a few cases, especially in spare people with languid circulation and chilly extremities, a common cold can be cut short by a dose of laudanum, and in some cases Dr. Sidney Ringer has found frequently repeated doses of tincture of aconite effectually stop the progress of a common cold. The inhalation of carbolic acid is sometimes very soothing, if used in the following formula, known as Dr. Hagner's Olfactory, highly spoken of by Dr. Brand in the Berlin *Klin. Wochenschrift:*

℞	Acid. Carbolic . . .	gr. v.
	Sp. Vin. Rectif. . . .	♏ xx.
	Liq. Ammoniæ . . .	♏ v.
	Aq. Destill.	♏ x.

'A few drops to be used for inhalation on a cone of bibulous paper.'

A medical man, with whom I am acquainted, can sometimes stop an incipient cold in his own person by taking a few pinches of snuff, and, even if the case is advanced, finds considerable alleviation of the sense of fulness and stuffiness by the use of this simple remedy.

Dr. Mann (*New York Medical Journal,* October, 1874) advises as local applications the use of a warm solution of salt (60 grs. to the pint of water), by means of the syphon douche or posterior nasal syringe. Next he applies a solution of nitrate of silver in glycerine (60 grains to the fluid ounce) to the entire surface of the nasal cavity (a method which would be thought, prior to experience, very heroic for a common cold). This application is recommended to be followed by the propulsion into the nostrils of the vapour of iodine, through an apparatus specially prepared for the purpose. Dr. Mann also employs as a snuff, finely pulverised camphor mixed with powdered white sugar. This always gives relief.

Dr. C. J. B. Williams speaks in the highest terms of the treatment of a common catarrh by *total abstinence from liquids.* "This method of cure," he says, "operates by diminishing the mass of fluid in the body to such a degree that it will no longer supply the diseased secretion." "The coryza begins to be *dried up* in about twelve hours after leaving off liquids. From that time the fulness in the head and the flowing to the eyes becomes less and less troublesome, the secretion becomes gelatinous, and between the thirtieth and thirty-sixth hour ceases altogether. The whole period of abstinence needs scarcely exceed forty-eight hours." (*British Medical Journal*, January 6, 1868, p. 554). Few patients, however, can be induced to try this remedy, preferring the catarrh *with* their liquids rather than the cure *without* them.

In persons subject to this form of nasal catarrh, it is often possible to check the tendency by improving the diet and keeping up the general circulation by warmer clothing, and avoiding exposure to cold and wet; at the same time taking care to enforce healthful exercise in the open air, and the avoidance of everything which is likely to disturb the digestive and assimilating functions.

Subsection 2.

Strumous rhinorrhœa is chiefly met with in ill-nourished children with feeble digestion, languid circulation, and associated with chronic enlargements of the lymphatic glands, eczematous eruptions on the face or head, and phyctenular ophthalmia and keratitis. The discharge is muco-purulent, often offensive, and the nostrils are obstructed partly by the swollen mucous lining and partly by greenish yellow crusts of the dried and congealed mucus.

In the treatment it is important—1st, to remove the crusts from the nostrils at least once or twice in the day. For this purpose the camel's hair pencil answers better in young children than the nose douche. The crusts do not extend deeply into the nasal fossæ, and the employment of the douche will only

cause increased irritation, not to speak of the difficulty of employing it in such young subjects. Glycerine and water, with a little carbolic acid (one part in sixty or eighty), applied to the crusts themselves by means of the brush will soon soften them, and they can then be washed away by a gentle stream of warm salt and water from a syringe; 2nd, to apply some form of soothing and non-irritant ointment, of which the ung. zinci benzoati is perhaps the best; and 3rd, to improve the general health by good diet, warm clothing, healthy exercise, cod-liver oil, and steel tonics, giving an occasional aperient when necessary. In many children thus affected there is some irritating condition of the bowels manifested by mucous discharges and the presence of ascarides. Treatment must of course be directed towards removing these irritant conditions, and the occasional use of clysters of salt and water or infusion of quassia is very useful in the attainment of this result. The combination of powdered bark with carbonate of soda, given two or three times a day, will often help very much in the same direction. The diet should be nutritious but not stimulating, and pastry and excess of sugar in any form should be especially avoided. Ripe sound fruit, cooked or uncooked, should be given daily whenever it can be obtained, and good milk is absolutely essential.

Associated with this chronic rhinorrhœa of strumous children, and sometimes succeeding it, there is often a *thickening of the mucous membrane* and the submucous tissues, especially of the covering of the inferior turbinated bones. The mucous membrane along the lower borders of these bones is thickened and overhangs the inferior meatus, reaching inwards almost to the septum, impeding the child's breathing, producing snuffling and a peculiar thickness of the voice, and often causing the surgeon to suspect a polypus.

The *diagnosis*, however, will not be difficult if the nostril be examined in a good light with Fränkel's speculum, when the broad base of the growth will become evident. The strumous aspect and the age of the patient will generally aid us in forming a correct opinion as to the true nature of the disease.

Treatment.—The general health is almost always at fault in these cases, and the administration of cod liver oil and iodide of iron will be necessary. The use of astringent applications, such as glycerine of tannin, solution of chloride of aluminium (gr. iv to f. ℥ j), or nitrate of silver (gr. v. to f. ℥ j) solution by means of a camel's hair pencil, and the careful regulation of the diet as above described for strumous rhinorrhœa, will generally suffice in the less severe cases to reduce the swelling of the membrane.

If, however, there is some amount of induration as well as enlargement, and if the mischief has been going on for a long period and causes much discomfort from the difficulty of breathing through the nostrils associated therewith, and especially if both nostrils are simultaneously affected, it will be good practice to cut away the redundant piece of membrane, either by means of scissors or by the knife. The nostrils can be kept open and distended during the operation by means of Fränkel's or some other speculum.

If, after removal of the growth and cicatrization of the wound there is still obstruction, it will probably be overcome by the application of the mitigated caustic (nitrate of silver and nitrate of potash in equal parts) applied along the surface of the inferior turbinated bone daily or every other day. Ledran employed catgut bougies for the purpose of dilating the cavity, introducing them along the floor of the nostril, and leaving them until they increased in size by the absorption of moisture, and gradually increasing the size of the bougie until the required amount of dilatation was obtained. Professor Boyer employed gum elastic canulæ with the same object, making the patient wear them day and night for a long period. Mr. William Adams employs a plug of ivory, shaped somewhat like a split almond, and I must give the preference to this form of instrument, as it does not become foul from the absorption of the secretions of the nostrils, and the passages can be easily dilated by the successive introduction of a series of plugs, each being slightly larger than the one previously introduced.

Subsection 3.

Syphilitic coryza, dependent upon mucous tubercles, is a connecting link between the ulcerative and non-ulcerative diseases of this mucous membrane. The disease is most commonly seen in young children of a few weeks or months old, affected with congenital syphilis, and may be associated with all the other symptoms of the disease.

The discharge is at first thin, muco-purulent, and offensive, but soon becomes thicker. The nostrils appear swollen and red at the edges, and the child is constantly affected with "snuffles," *i.e.*, a noisy respiration and snuffling sound is heard with each inspiration and expiration, due to the swollen state of the mucous membrane and the crusts of dried mucus covering it and obstructing its passages.

In the worst cases the nostrils become completely obstructed, and the child can only breathe through its mouth. In sucking, therefore, the child is constantly obliged to stop to get its breath, and respiration becomes very much impeded. Hence it is very necessary to remove the crusts at this stage, and the child will probably have to be fed by means of a spoon, the action of sucking being rendered so difficult as to be almost impossible.

Associated with the disease within the nostrils the external parts of the nose at the edges of the alæ are often the seat of pustules, fissures, and deep ulcerations, and the larynx and other parts of the throat are often similarly affected, so that the voice becomes dull, hoarse, and disagreeable, or may be even entirely lost. The discharge meanwhile becomes thin, sanious, and sometimes tinged with blood. The ulcers may go on to caries and ulceration of the bones and cartilages. The general health is at the same time becoming more and more influenced by the constant inhalation of fœtid gases from the putrifying crusts in the nostrils, as well as from the progress of the constitutional disease, and death often ensues from this combination of adverse circumstances. Hæmorrhage from the nostrils, consequent on the

efforts made by the child in respiration and the detachment of the crusts with some violence, is an occasional complication.

Syphilitic coryza or rhinorrhœa is distinguishable from ordinary catarrhal rhinorrhœa by the history of syphilis in the parents, by the presence of ulcers or fissures of the alæ nasi, upper lip or pharynx, and by the hoarseness or loss of voice, indicating similar ulcers or tubercles of the larynx. It is often the *first* symptom of syphilis that shows itself in new-born infants; we may therefore not have any of the usual symptoms of the disease, such as copper-coloured eruptions, &c., to guide us in diagnosis. In "snuffles" of this kind the cleansing of the nostrils by means of the nose-syringe with warm water is still more necessary than in simple coryza, and if the discharge is very offensive a weak solution of permanganate of potash, or aluminium chloride will be very useful. After that cleansing, then the grey oxide of mercury ointment, diluted with benzoated lard, should be passed into the nostrils, and this must be repeated twice or thrice in the day. Meanwhile constitutional treatment by means of mercury will be absolutely necessary, either by means of inunction or by giving grey powder internally. After a course of mercury, cod-liver oil and iodide of iron will generally suffice to complete the cure. If, after the acute symptoms have subsided, the mucous membrane is still swollen and semi-ulcerated, a weak solution of nitrate of silver (gr. ij to f. ℥j), applied by means of a camel's hair pencil will be very useful in most cases.

Syphilitic coryza in adults is of the same kind, but is much more obstinate, and will generally be found to be associated with ulcers. For these patients constitutional treatment by mercury is not often requisite. In all probability they have already undergone a course during an earlier stage of the malady. Hence iodide of potassium, or sodium, or ammonium, will be generally more likely to benefit the patient than a mercurial course. Dr. Prosser James speaks highly of the iodide of calcium in the treatment of ozæna, and prefers it to iodide of potassium on account of its taste being less nauseous. The local

treatment by the douche* is absolutely essential, and probably the best solution for this purpose is a weak solution of permanganate of potash, in the proportion of f. ʒi of Condy's Fluid to a pint of water, which should be used tepid. A stronger solution can be used if the weaker one is unirritating.

Subsection 4.—*Epistaxis: its Varieties, Causes, Treatment—occasionally Symptomatic.*

Bleeding from the nose, being in the majority of instances either salutary or unimportant, is only brought strikingly under the notice of the surgeon when its copiousness, frequency, or persistence render it alarming to the patient and his friends.

It is, perhaps, the commonest of all hæmorrhages met with in medical or surgical practice, and when we consider the delicate structure of the nasal mucous membrane, the number of vessels with which it is supplied, and their very superficial course, the slight support afforded them by the surrounding parts, their continual exposure to irritating foreign bodies, and to great changes of temperature and moisture in the atmosphere, it is not to be wondered at that this region is so frequently the seat of hæmorrhagic fluxes. The fact, however, that all persons are not equally liable to this form of hæmorrhage makes us seek for other causes beyond the mere physical structure of the part. We must recognise also vital action as a predisposing and accidental irritation, or injuries as exciting causes. Hence it is convenient to divide the different forms of epistaxis into, 1st, the *traumatic*, or lesional; 2nd, the *plethoric*, or active; and 3rd, the *adynamic*, or passive. And here I must acknowledge my great obligations to the masterly and

* The cases of deafness following the use of the nasal douche, recorded by Dr. St. John Roosa, are not, in the opinion of the author, conclusive evidence that the deafness *resulted* from the use of the douches. On the contrary, in some of them the nature of the disease, for which the douche was employed in the way of treatment, was such that the deafness might be fairly attributed to the extension of diseased action along the Eustachian tubes to the internal ear, or even to temporary obstructions of the tube itself.

exhaustive treatise of Dr. Hippolyte Cloquet on "Osphrésiologie," a treatise that it would be impossible and even culpable to ignore in a work on the diseases of the nose, and which I shall, as occasion requires, quote without reserve and without apology. Though it bears on its title-page the date 1821, there is such a mass of learning and research contained in it, that little remains to be added to it, even at the present date, and on this particular section it offers a most complete résumé of all that had been written up to the time it was published.

1. *Traumatic or Lesional Epistaxis* may be occasioned by an external injury, such as a blow on the external parts. It may also be caused by injuries of the mucous membrane itself, or fractures of the bones with consequent laceration of the mucous membrane. Ulcers, cancers, &c., may be the cause of erosion of the vessels and consequent hæmorrhage.

2. *The Plethoric, or Active Epistaxis,* is preceded by excessive local congestion, and occurs in young and robust persons, who live luxuriously and indolently, and is often preceded by a set of symptoms designated as the molimen hæmorrhagicum, or nixus hæmorrhagicus.

The patient has wandering pains in various parts of his body, and experiences a general sense of uneasiness. At length, his pains concentrate themselves in his head and forehead, and he has a feeling of intolerable weight and fulness in the region of the frontal sinuses, with congestion of the face and sclerotic of the eyes, and a singular sensation of humming in the ears. The pulse is full, frequent and bounding. In many cases coryza or blenorrhinia have preceded this form of epistaxis; and often the two affections alternate with one another.

3. *Adynamic or Passive Epistaxis.*—This occurs in persons who are naturally feeble, or who have been lowered by disease, or some other debilitating condition, and is especially liable to occur in scurvy and pupura. It is not usually preceded by any precursory molimen. The blood effused is of dark colour, serous, and but little disposed to coagulate.

Traumatic epistaxis is in the majority of cases of no im-

portance, and as a rule cures itself. But it sometimes happens that blood escaping from the posterior part of the nares finds its way down into the pharynx, and thus the patient may be losing a great quantity without any flowing through the nostrils, and without any visible cause for his growing pallor and faintness. It generally happens, however, that when the blood has been swallowed in any considerable quantity vomiting occurs, and coagulated blood appears in the vomit. But even this may not be sufficient to point to the real source of the hæmorrhage. So that, in all cases of obscure hæmatemesis, the possibility of some lesion in the pharynx or the posterior nares should be inquired for, and, if necessary, local pressure by plugging should be had recourse to.

On the other hand, epistaxis following a violent injury of the head, may be a symptom indicative of a fracture of the base of the skull, and in this case too the blood may not escape at once from the nose, but may be swallowed, or may flow through the mouth, or be subsequently vomited.

As a diagnostic sign of fracture of the base of the skull, however, bleeding from the nose has little value, unless associated with bleeding from the ears and into the orbit, or under the ocular conjunctiva. Mr. Prescott Hewett found, nevertheless, that out of thirty-two cases of fractured base at St. George's Hospital in ten years, bleeding from the nose or mouth, or subsequent vomiting of blood, was present in no less than fourteen cases. (Holmes's "System of Surgery," vol. iv, p. 127.)

Both active and passive epistaxis may be idiopathic* or symptomatic.

In the production of hæmorrhage from the nose by a blow on the external parts, either of the nose, or the bones adjacent to it, the immediate effect is to cause sudden extreme congestion of the mucous membrane and rupture of the distended capillaries. The same thing happens in active idiopathic epistaxis, and

* Man alone, among the animal creation, is subject to this affection.—Blumenbach, "De Varietate Humani Generis."

whenever it is produced by violent sneezing, coughing or straining efforts of any kind.

Druggists are often subject to this troublesome form of hæmorrhage from inhaling irritating powders, while in the act of pulverising them, especially from the powders of ipecacuanha, scammony and jalap. Lifting heavy weights, violent exercises, such as running, leaping, and rowing will in young plethoric persons produce the same effect. Dancing is mentioned as another occasional exciting cause, and in some persons of a sanguine temperament epistaxis follows the act of coitus.

Violent mental emotions, such as fear, anger, indignation, rage, and the effort involved in singing or speaking for a long period will, in some individuals, bring about a similar result. The predisposing conditions in all these cases are the sanguine temperament, youth, and a tendency to mucous rhinorrhœa, whereas adults are much less liable to the same accident. But in elderly persons the occurrence of epistaxis denotes rather an apoplectic tendency, or some obstruction to the circulation through the right cavities of the heart, generally valvular disease; and hence in their case the hæmorrhage is symptomatic, and more important as a diagnostic indication than in the former category. Congestion and various organic diseases of the liver are often attended by epistaxis.

It is symptomatic in the case of suppressed cutaneous exanthemata, in the suppression of perspiration, or of the menstrual flux, or habitual bleeding from piles. Women sometimes suffer from epistaxis about the middle period of gestation.

Among the external conditions predisposing to epistaxis, a cold dry climate, sudden changes of climate or temperature, an unusual height above the sea-level, with extreme rarefaction of the air, are the most noticeable. Spring predisposes to it more than the other seasons. Cold baths, or very hot baths, and washing the hands in very cold water are also among the influences tending in the same direction. A sedentary life, high living, excessive indulgence in alcoholic drinks, excessive brain work and absolute continence are also predisposing causes.

Some other causes act locally and more slowly—as, for instance, the use of snuffs, or the exposure to irritating powders or gases for a long period, the constant recurrence of or tendency to nasal catarrh, and the idiosyncrasy in some individuals that excites a disgust at certain odours. The odour of the rose, of apples, and of cheese have been known in certain families or individuals to bring on bleeding from the nose whenever they have been exposed to their influences.

The passive or adynamic form of epistaxis differs from the active in the fact that in those subject to it, the balance between the resistance offered by the containing walls of the vessels and the strength of the blood current is disturbed rather from an inherent weakness in the former than from an excessive propulsive energy in the latter. The persons predisposed to it are the weak, lymphatic, languid and delicate; often those of advanced age with atheromatous disease of the arteries and a tendency to apoplexy; those who are debilitated by poor living, by the long abuse of purgative medicines, by a scrofulous constitution, or by scurvy or syphilis; those who have suffered from the lowering forms of fever, or from chronic diseases of the internal organs, or from long continued mental worry or depression.

It would be out of place here to enter into the question of the significance of epistaxis as a *symptom* in the various stages of the different kinds of fevers, or to discuss the question of the *critical* hæmorrhage in acute diseases. It is, however, interesting to note that this symptom is or was regarded by physicians as of great importance as a guide to prognosis in certain cases of acute disease.* Vicarious epistaxis is well known to occur in young women in whom menstruation is irregular or has been suddenly suppressed, and it gives decided relief to them under

* Galen is said to have rendered himself famous by predicting, in the presence of a number of bystanders, that a patient would have a critical epistaxis from the right nostril, and that his sufferings would thereby come to an end. The patient was a young man in the fifth day of an acute fever; he was in violent delirium, struggled to get out of bed, and thought he saw *a red serpent*. The right side of his face was of a dull purple colour.—Cloquet's "Osphrésiologie," p. 559. The subjective symptom "*seeing a red serpent*," here described, was, no doubt, due to

such circumstances. A similar nasal hæmorrhage sometimes relieves vicariously patients in whom an habitual bleeding from piles has been suddenly suppressed. A very fatal *epidemic*, characterised by bleeding from the nose, is recorded as having occurred in Etruria and Romandiola in the year 1200 (Morgagni, "De Sedibus et Causis," etc., epist. i, No. 25); and Gillchrist also mentions *epidemics* of nose bleeding.

Epistaxis is frequently the immediate cause of death in children with diphtheria. Dr. Thomas Parker Smith relates that he saw an epidemic of diphtheria when he was resident surgeon of the Stafford Infirmary in 1859 or 1860. Out of nearly 30 cases under his care, most of whom were children, about 12 died from epistaxis, and, in consequence of the age of the patients and the state of the fauces, it was impossible to plug the posterior nares. Dr. Parker Smith tried styptics of all kinds, and the patients were in every respect well cared for, but the results of treatment were very unsatisfactory. It is not unlikely that the epidemics of epistaxis recorded by Morgagni and Gillchrist may have been diphtheria epidemics, that disease not having been accurately described or recognised at the periods of the outbreaks alluded to.

A tendency to epistaxis is sometimes hereditary. It sometimes depends on a too great diminution of atmospheric pressure, as in ascending high mountains or going up in balloons. Under these circumstances great fatigue and excitement accelerate the heart's action and so add to the blood pressure, thus aiding in the same direction as the diminished resistance of

retinal hæmorrhage, or hæmorrhage into the vitreous humour, and indicated an atheromatous or rotten state of the arteries generally. Had Galen lived in the present day, he would have examined the patient with the ophthalmoscope, and would then possibly have discovered actual hæmorrhages within the eye, justifying his prediction of a subsequent epistaxis. It has been noticed by Dr. Hughling Jackson, that epistaxis sometimes precedes retinal hæmorrhages, as it does apoplexy of the brain. (See London Hospital "Clinical Lectures and Reports," vol. iii, p. 251.) (Case LI, in the Appendix.) Whenever passive epistaxis occurs, especially with retinal hæmorrhage, it is significant of some chronic disease, and very often of kidney disease associated with albuminuria.

the rarefied air in forcing the blood through the walls of the vessels.

Treatment.—The principal function of the practitioner when called upon to treat a case of epistaxis is to decide whether interference is safe or desirable, and in the majority of cases he will decide in the negative.

It is not uncommon, as above stated, for young and robust adults to have occasional bleedings from the nose, with a sense of relief following it; and in such cases the diet is probably at fault. A less liberal supply of food and an occasional saline aperient will effectually prevent any recurrence of the epistaxis in such cases. For though the occasional flow of blood from the nostrils is followed by relief in such cases, it is nevertheless a source of much inconvenience while it lasts, and if it becomes habitual may be difficult to deal with.

When the epistaxis is vicarious, either of the menstrual flow or of some habitual hæmorrhage, as for instance, from old standing piles, it will be improper in the first instance to attempt to check the flow of blood. Our first efforts in such cases must be towards restoring the habitual or normal evacuation. This done, the vicarious bleeding will cease of its own accord.

In plethoric persons of advanced years with indications of atheromatous disease of the arteries, bleeding from the nose is often rather salutary than otherwise, and it is unwise to check the flow unless it becomes alarming from its persistence or frequent recurrence.

Epistaxis following blows upon the nose is very seldom important, and in most instances may be stopped by causing a stream of cold water to be drawn up the nostrils by a forced inspiration. Cold applied to the root of the nose will assist the other remedy.

When from whatever cause the amount of blood lost is alarming, it becomes an important part of the surgeon's duties to allay terror and excitability on the part of the patient, and by a calm manner and soothing words to prevent him from increasing the difficulties of the case by restlessness and nervous

agitation. The air of the room must be kept cool with a free current of air circulating around him and, unless the weather happen to be unusually cold, he may be placed in a "thorough draught" without any danger. He should sit or stand with his head erect, his shoulders thrown well back, and his throat denuded of all neckcloths, or tight bands of any kind. Meanwhile the trickling of blood from the nostrils will cause a constant inclination on the part of the patient to bend the neck forwards. This must be resisted, and the dress protected by towels round the upper part of the chest and a sponge held up to the nose. If, however, the attack of epistaxis occurs in a weakly person, and especially if much blood has been lost, the semi-recumbent posture will be more suitable, the shoulders being raised and supported between the scapulæ. Ice, if at hand, may be given by the mouth, thrust up the nostrils, and applied to the root of the nose and forehead. Any form of ice-bag will be convenient for applying the cold to the outside of the nose, but, if obtainable, the india-rubber ice-balls prepared for me by Messrs. Corbyn, and by Mr. Hall of Wigmore Street, are very convenient, and have been used with success in these cases. A large street-door key or a cold flat-iron put down the back or to the nape of the neck, are popular remedies, and may be employed till ice can be procured.*

Dr. Chapman has found warmth applied to the back of the neck (by means of water in his india-rubber bag at a temperature of 115°) have a very decided effect in stopping hæmorrhage from the nose. This probably acts as a derivative, in the same way as dry cupping, which is also recommended by Dr. Graves in his "Clinical Lectures," vol. ii, p. 316. But this is not the explanation given by Dr. Chapman himself, who maintains that the effect of heat, applied as he directs, is to stimulate the sympathetic ganglia, and, through the sympathetic nerves,

* Cloquet observes as instances of curious sympathetic phenomena connected with epistaxis, that cold water applied to the brow, temples, hands, shoulders, or scrotum will *arrest* epistaxis; and yet that frequently the sudden application of cold to a large surface of the skin immediately *brings on* epistaxis. (Osphrésiologie, p. 349.)

cause contraction of the arterioles supplied by them. Dr. Chapman records three cases of epistaxis (*Medical Mirror*, Feb. 1, 1870) cured by the application of an 8-inch double columned water-bag containing water at 115° Fahrenheit, to the lower two-thirds of the cervical spine, and between the shoulders. In these cases the bleeding had recurred frequently, and almost habitually before the treatment was employed that proved so successful in checking it. At the same time a stream of cold water, containing alum or some other astringent in solution, may be injected into one nostril, while the patient bending forwards, breathes through his mouth only. The patient breathing thus through the mouth only, the pharynx is shut off from the posterior nares, and the stream of water passes from the one nostril to the other, and out at the anterior apertures of the latter.

This method, however, may not be available, either from the absence of the necessary syringe, or from the nervousness of the patient; and we must then proceed to plug the nostrils with dossils of lint. If the posterior nares are to be plugged (and it will be advisable in any case in which the foregoing remedies have failed), Belloc's instrument will be required, or a gum elastic catheter, with a double loop of stout ligature thread passed down its channel and out at the eye of the instrument. This is then carried along the floor of the nostrils, and the loop seized and drawn through the mouth; the catheter is then withdrawn from the nose, leaving the thread lying within it, and passing out of the month. A dossil of lint of about the size of a man's thumb, is now tied in the middle of the double thread, one end of which is left hanging from the mouth, while the lint is drawn

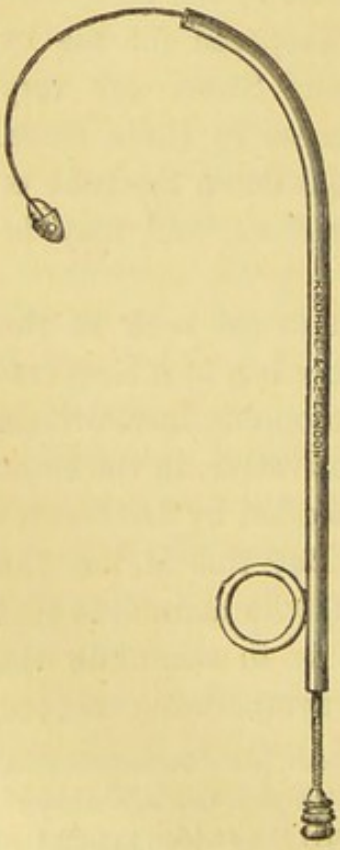


Fig 8*b*.

backwards by pulling upon the two ends passing from the nostrils (fig. 7, Plate IV). The lint becomes thus wedged tightly against the posterior aperture, and the escape of blood posteriorly is completely stopped. A plug of lint is now placed across the anterior aperture of the nostrils, and the two ends hanging from the nostril tied tightly over it. This answers the double purpose of keeping the posterior plug in position, and of plugging the anterior nares at the same time. It may then be necessary to plug the other nostril in the same way. At the end of thirty-six,* or at latest forty-eight hours, the plugs should be removed, and the nasal fossæ syringed with a weak solution of alum or with cold water, until the clots are removed. Various ingenious contrivances have been suggested and devised, with a view to simplifying the operation of plugging the posterior nares. The best apparatus of the kind is that invented by Dr. A. Cooper Rose, of Hampstead, and made under his direction by Mr. Coxeter, of Grafton Street. It consists of a gum elastic tube about 5 inches long, with lateral perforations near the end, and covered with thin caoutchouc membrane in the form of a spirally twisted bag, for the last 3 or 4 inches of its length. The cavity of the bag can now be injected with air or water from the gum elastic tube, the end of which has fitted to it a piece of india-rubber tube, for the purpose of connecting it with a syringe or india-rubber injector. Practically, the mouth answers the purpose of an inflator for this instrument. To use it the membranous bag is smoothly folded over the contained tube, and the whole being oiled is passed along the floor of the nares

* There is some danger of inducing blood-poisoning if the plugs are retained beyond the time necessary to cause the formation of firmly adherent clots. In a case of severe epistaxis in the course of leucocythæmia, lately recorded by Dr. Habershon, plugging of the posterior nares was followed by death from pyæmia, though in this instance the plugs were removed at the end of twenty-four hours; the sinuses of the dura mater being found after death filled with a green pus-like fluid. (*Lancet*, Feb. 27, 1875.) The same result has also happened in other instances on record; but the constitutional state of the patient has more influence in determining these results than the accidental local condition due to plugging. I may mention, on the authority of Dr. Habershon, that among the accidents of plugging tetanus is said to have once followed.

till it reaches the pharynx. The bag is now inflated or injected with water, and the expansion of the bag both in front and behind suffices to completely close both apertures (figs. 9 and 9*a*).



Fig. 9. Fig. 9*a*.

If a post-cock is fitted, the air or water is kept in by turning it as soon as sufficient tension is obtained, but the same object may be attained by tying the india-rubber connecting tube tightly up.

This is a much better, as well as much simpler apparatus than that of M. Martin St. Anges, in which the tube communicates with the bag at one end only, the bag itself hanging loose from the extremity of the tube, so that in order to introduce it into the nostrils it is necessary to push it along the floor of the nose on the end of a probe.

When it is desired to remove the plug, the water is let out by untying the india-rubber connecting tube or by turning on the stop-cock. The instrument is at once set free and removed without difficulty. This plan offers two advantages: the plug is more readily introduced and more easily withdrawn than by the method of plugging with Belloc's instrument. If a sponge-tent is at hand, it may be used as a plug, leaving it in the nostril till the warmth of the part expands it. In removing it, however, there is some difficulty, as the rough surface of the sponge becomes somewhat closely united with the inequalities of the mucous surfaces, and hence it is only in cases of great urgency that this form of plug should be employed.

Dr. Negrier, of Angers, France, has called the attention of the profession to a remedy which he has employed frequently and with uniform success in the treatment of epistaxis. It con-

sists simply in causing the patient, in a standing posture, suddenly to raise one or both arms perpendicularly upward, and to retain them for a short time in this position. If only one is raised it should be that of the side from which the hæmorrhage proceeds, and then the patient may compress the bleeding nostril with the other hand. In young children the surgeon may perform both offices for the patient. The remedy has always succeeded, even in very bad cases, when all other means had failed. The effect is almost instantaneous, and usually continues permanent, if the patient has lost a certain quantity of blood—say from six to nine ounces. The elevated position of the arm should be sustained a few minutes, in order to give the blood in the bleeding orifices time to coagulate.

Dr. Negrier explains the result by the consideration that as the blood in the erect position of the arm requires a much greater force to sustain it than when the arm is pendent, the energy of the heart's contraction must be in the same proportion diverted from the carotid to the subclavian. ("Archiv. Générales," 3me sér. xiv. 168: Wood's "Practice of Medicine," vol. ii, p. 294.)

Dr. T. Parker Smith found this method succeed in several cases while in India in charge of the 104th Regiment.

Whatever may be the rationale of this method, it has the great advantage of requiring no instruments or appliances in order to put it into practice; it will therefore be always worth while to try it during the time that other means are being prepared, and while ice and instruments are being sent for.

Sometimes pressure of the side of the nostril against the septum will arrest the bleeding, if it come from the lower part of the septum itself, as there is reason for thinking it not unfrequently does.

We are indebted to Mr. Banks, of Liverpool, for pointing out that in some rare instances the bleeding surface is situated in the upper part of the pharynx and behind the soft palate. In an obstinate case of this kind plugging the posterior nares failed to stop the bleeding, and there was evidently a flow of blood

down the pharynx even after the nares were plugged, though there was no defect in the method of plugging or the efficiency with which it was carried out. Under these circumstances the plug was removed, and a strong solution of perchloride of iron was injected by means of the spray apparatus through one nostril, the other nostril being at the time closed and the mouth also kept closed. This method, persevered in for a fortnight, quite stopped the bleeding, and on its recurring was again resorted to with an equally good result. (See case in full in the Appendix, Case No. II.)

In any similar case, and indeed in any case in which plugging was undesirable or very difficult to carry out, this method of treatment should be resorted to. A weak solution may be at first tried, and if that fails a stronger one can then be employed. It seems necessary for the success of the treatment that the spray should be rapidly sent into the nostrils, and the action kept up continuously until the spray has collected in drops and runs down the walls of the nasal fossæ or pharynx. The minute division of the astringent solution enables us to reach every part of the surface, and the flow is sufficiently gentle to avoid the risk of washing away the clots as they form over the vessels.

In the absence of any rhinoscopic observations in the above case, it is not clear what was the exact pathological condition giving rise to the hæmorrhage. There are, however, two affections of the glands in the naso-palatine and naso-pharyngeal region, from one of which it may have indirectly arisen, viz., the naso-palatine gland disease described by Dr. Andrew Clark (see Subsection 7), and the naso-pharyngeal adenoid vegetations described by Dr. W. Meyer (see Subsection 7). Though epistaxis is not a common symptom in either of these diseases, it is just possible that in some temperaments ulceration may be set up in the affected glands, and hæmorrhage would then be a very likely accident of the disease.

In the epistaxis coming on during an attack of diphtheria, the treatment by the spray of perchloride of iron would be a valuable means of applying styptics, though in the young

patients, who are so often the subjects of this disease, it is very difficult to keep them quiet enough to admit of the required manipulation. In adults and manageable children, however, it might be employed with great advantage.

As soon as the flow of blood is stayed, a tendency to a recurrence of the attack will have to be provided against. Constipation will be perhaps an exciting cause, and in this case saline purgatives will be required. The following formula is useful in such cases.

Magnes. Sulphatis . . .	ʒii to ʒvi
Acid. Sulphuric Dil. . .	♏x
Aq. Pimentæ ad . . .	℥ji

To make a draught to be taken every three hours until the bowels are relieved.

In cases of obstructive or regurgitant disease of the valves of the heart, sedatives, and especially digitalis in combination with mineral acids, will probably be required.

In all cases it is desirable to enforce abstinence from alcoholic drinks and physical quietude with a cooling regimen for some weeks after a serious attack.

If the accidental hæmorrhage happen to be associated with the hæmorrhagic diathesis, it may be very difficult to check it, even with plugs and styptics; but these remedies offer the best chance of success, especially if combined with internal remedies of the astringent class. Epistaxis being occasionally symptomatic of the commencement of febrile disorders, being also a symptom associated with polypus, with ulcers of the nostrils with or without diseased or necrosed bone, with malignant disease within the nostrils, with foreign bodies (*e.g.*, worms*) in the frontal sinuses, and with injuries of the bones,—the treatment of the symptom in each of these cases will be involved in that of the leading or exciting disorder.

* See Boyer's "Maladies Chirurgicales," vol. v, p. 133. After an epistaxis there came from the nostrils a worm having the form of a leech. M. Boyer thinks it probable that this supposed leech was only a long clot of blood.

Subsection 5.—*Cysts.*

The nasal cavities proper are seldom the seat of cysts originating in their own lining membrane, though they are occasionally invaded by cystic growths in the antrum and the other accessory sinuses. A remarkable case, however, occurred to Dr. George Johnson (see Appendix, Case I), in which, by the use of the rhinoscope, he discovered a cyst occupying the right side of the posterior nares, which had existed for two years without having been discovered. It formed a globular tumour as big as a full-sized marble, and of a yellowish-green colour. By introducing forceps along the floor of the right nostril, the cyst was grasped and burst, and the patient got immediate relief (see figs. 6 and 7).

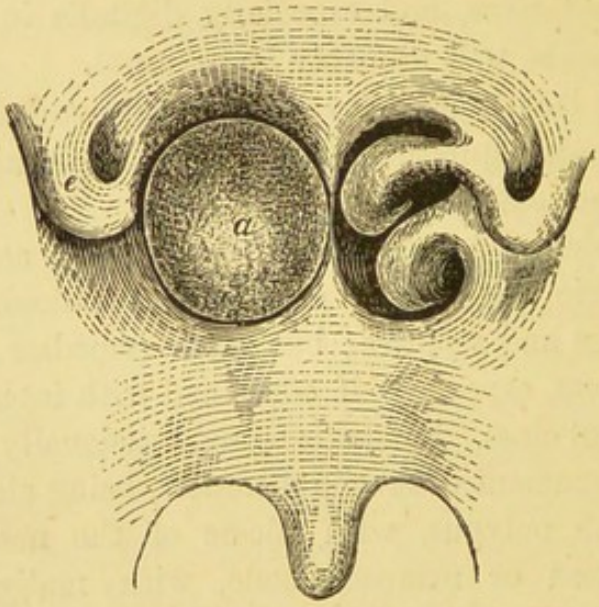


Fig. 6. Posterior view of the uvula, soft palate, and nares, as seen by rhinoscopy.
a. A globular tumour obstructing the posterior opening of the right nasal fossa.
e. The orifice of the right Eustachian tube.

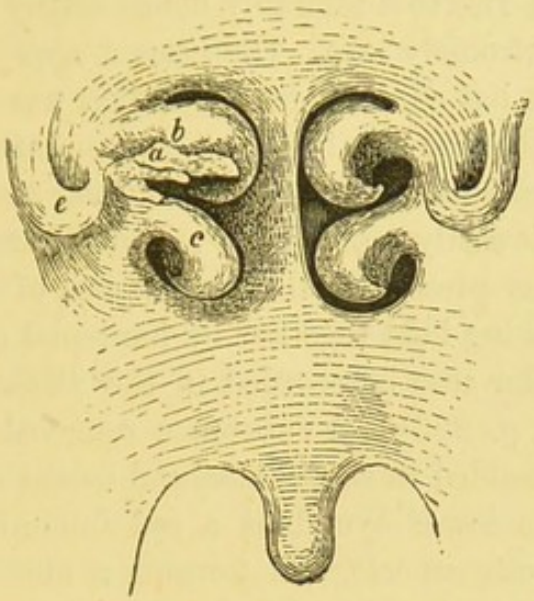


Fig. 7. The posterior nares, after the removal of the tumour represented in fig. 6. *a*. The abraded surface from which the tumour was torn. *b*. The middle, and *c*, the inferior turbinated bone. *e*. The Eustachian tube.

This is the only case of the kind that I find recorded. In all probability it resembled, in its origin and structure, the cysts met with in the antrum of Highmore, of which more will be said in a future chapter.

Subsection 6.

Nasal Calculi—Rhinolithes.—The concretions occasionally found in this cavity and, especially in the lower part, under the inferior turbinated bone, are, for the most part foreign bodies, around which mucous and phosphatic deposits have become agglutinated and hardened in successive layers. Graefe considers that the gouty dyscrasia favours the formation of these concretions; but it is unlikely that any true calculus, apart from the accidental presence of a nucleus consisting of a foreign body introduced from without, or projected from the pharynx in the process of deglutition, has ever been formed in this cavity. It is just possible that the crusts formed in chronic ozæna may, when retained for a lengthened period, become consolidated, and subsequently encrusted with carbonates and phosphates of lime,

and hence give rise to a tolerably dense earthy mass; but such instances are extremely rare. The nearest approach to anything of the kind that has come under my notice, was a small greenish body, of about the size of a split pea, and in external appearance not unlike a small pea, situated in the upper part of the lachrymal sac. It was easily removed by making a small incision, and when cut across presented the appearance of hard putty, the earthy matter being held together by hardened mucus.

A very similar case is recorded in the *Pathological Transactions* (vol. xxiii, p. 293). A substance removed from the lower canaliculus resembled in shape, size, and colour a green pea. It appeared in the lower eyelid as a red inflammatory swelling projecting on both aspects, and forming a most unsightly prominence about the size of a hazel nut. The young lady from whom it was removed thought it was the *identical pea* which she had once when at school *thrust up her nostril*, and had never been able to get out again. It is clear, however, from the microscopic examination made by Dr. J. S. Bristowe, that it was nothing more than a mass of inspissated pus mixed with, and held together by, vegetable organisms of a low type. It consisted, according to Dr. Bristowe's report, "first, of immense numbers of lowly vegetable organisms; and, second, large numbers of small, roundish or angular bodies, which, from their size, arrangement, optical properties, and behaviour, seem to be dead and disrupted nuclei of cells. The vegetable organisms, are, I think," says Dr. Bristowe, "chiefly dead and motionless bacteria, and fine confervoid filaments. The nuclei, or fragments of nuclei, are doubtless derived from pus or epithelium."

M. Cloquet ("Osphrésiologie," p. 627) gives the following instances of nasal calculi recorded by different authors. Th. Bartholin relates that a young Danish woman, after suffering from pains in the head for a long period, expelled from the nose several calculi of the size and shape of date-stones. Gab. Clauder saw a woman of 60, of a catarrhal constitution, who passed by the same passage a rounded, very hard concretion of the size of a hazel-nut. J. F. Khern witnessed the escape

of four pea-shaped calculi from the nostrils of a young female suffering from violent headache, and whom he treated by the administration of errhines. Riedlin, D'Ulm, Buchner, Plater, and several others, have recorded instances of this remarkable affection. Occasionally we see similar concretions, having for their nucleus a hard body introduced from without; for instance, M. Savialles informs us of a case of this kind.

Some remarkable cases are recorded by Mr. Cæsar Hawkins, in his "Contributions to Pathology and Surgery" (vol. i, p. 225).

In one of his cases, bodies like half-formed cartilage came away every now and then, looking as if they had been moulded to the superior spongy bone. The patient in this case was delicate and subject to hæmoptysis, and the nostril was usually obstructed for a day or two previously to their discharge.

In another case, a body presented in one nostril, looking exactly like a malignant polypus, associated with some external swelling of the parts and causing pain and obstruction in both nostrils; at last some body projected lower than usual in the nostril, and a surgeon pulled out several substances like chalk in consistence, and exceedingly fœtid, and which were also in shape exactly like the spongy bones; they were probably composed of phosphate, or perhaps carbonate of lime, with fœtid mucus secreted from the upper spongy bones.

Diagnosis.—The account given by the patient of having introduced a foreign body into the nostrils will often guide the surgeon, but the probe and ocular inspection will be necessary before any certainty of the nature of the case can be arrived at. The diagnosis in some cases may be very difficult; a pea that had sprouted in the nasal cavities having been, in one recorded instance, mistaken for a polypus.

Treatment.—If the body is of small size it may be expelled by exciting a fit of sneezing, and, in the case of timid people or unmanageable children, a pinch of snuff will, perhaps, bring about the desired result *tute, cito, et jucunde.* When larger it may be seized and dislodged by the fenestrated scoop, or the

fenestrated forceps with separable blades (fig. 8*a*). But if too large to be extracted entire without lacerating the parts, it must be broken up by a drill or strong forceps, and extracted piecemeal, as we find was actually done in a case related in the *Gazette des Hôpitaux* for 1859. The patient suffered from attacks of severe pain, at first supposed to be neuralgic, but afterwards attributed to necrosis of the nasal bones. The calculus was at last discovered and crushed by lithotrity at four sittings, and ultimately got rid of, but with some deformity of the nose remaining. It is hardly possible to lay down any universally applicable rules for the treatment of cases so varied in their circumstances, and so rarely met with in practice, but the fact that such cases, as that last alluded to, may be met with should be taken into account in the formation of a diagnosis in obscure cases. As another alternative in the treatment of large or firmly-fixed concretions, we may endeavour to thrust them backwards into the pharynx, if it is found that they are more movable in that direction than towards the anterior aperture. And here the employment of posterior rhinoscopy would be a great aid in determining the best method of extraction. Lastly, there is the possibility of leaving the foreign body or calculus to be extracted, partly by Nature's efforts, and partly by the assistance of Art. In process of time ulceration will take place around it, and this will have the effect of loosening it from the bed in which it has been so tightly wedged. Then, by using the douche apparatus through the opposite nostril, it may be dislodged and expelled, without the introduction of scoop, forceps, or any instrument whatever.

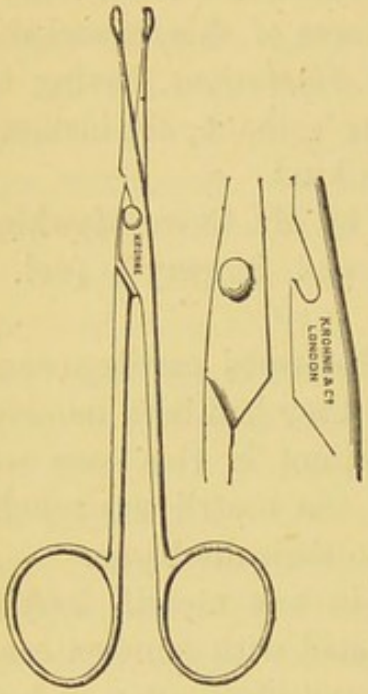


Fig. 8*a*.

SUBSECTION 7.—*Naso-palatine Gland Disease and Adenoid Vegetations of the Naso-pharyngeal Region.*

The glands of the mucous membrane in the naso-pharyngeal region are very numerous in the neighbourhood of the posterior nares and the Eustachian tubes. Dr. Andrew Clark* describes them "as racemose, saccular, and compound follicular. The place of each is indicated by a slight prominence, in the centre of which is a round, thick-lipped opening. This opening leads to a general cavity, with communicating recesses. In health they secrete a yellowish viscid mucus, which has the power of converting starch into sugar. They are subject to three kinds of morbid change. 1. The production of an excessive quantity of viscid mucus. 2. The formation and discharge of pus-like fluid. 3. Retention of either of the foregoing in the cavities of the glands, and its conversion into fœtid, cheesy masses, which are from time to time extruded through the nose or mouth. The symptoms are discomfort, aching, or pain in the neighbourhood of the soft palate and posterior nares; tingling or sense of fulness about the root of the nose; frontal headache; a mawkish or fœtid taste in the back of the mouth; a thick mucous, purulent or cheesy secretion discharged at intervals, chiefly through the mouth, by means of snorting nasal inspirations, followed by hawking; slight perversions of taste and smell; alterations of voice; sometimes temporary deafness from obstruction of one or both Eustachian tubes; and an abundant secretion of wax in the external ear. The presence of the disease is demonstrated by the rhinoscope." Dr. Andrew Clark has found that some benefit is derived from the following plan of treatment. First he directs the patient to irrigate the posterior nares with a solution of chlorate of potash, by snuffing up the solution through the nostrils, the level of the nostrils being placed under that of the solution. He then applies a strong nitrate of silver solution with a camel's-hair brush on a stem properly curved for the purpose; and lastly, again irrigates

* See "London Hospital Reports," vol. i.

the parts with solutions of tannin and alum. The results of treatment are, however, not always very satisfactory, the disease being very obstinate and resisting treatment for a long period. Constitutional remedies do not seem to have much influence over the local affection. I look upon this disease as closely allied to, if not identical with the chronic pharyngeal catarrh in which the tonsils are often secondarily involved, and in which we observe the same cheesy fœtid masses extruded from the glandular recesses of the tonsils, as are found in the case of naso-pharyngeal gland disease. A physician of over 60 years of age was under my care some years ago with small superficial abscesses of the size of split peas at the back of the pharynx, the secretion from which had the peculiar fœtid character described as existing in the above-described malady. This gentleman shortly after died of acute phthisis. A few other cases of the same kind have come under my notice.

Adenoid vegetations of the naso-pharyngeal region are described by Dr. W. Meyer, of Copenhagen, in vol. liii. of the *Medico-Chirurgical Transactions* as being very prevalent in Denmark. "These vegetations are found to consist of adenoid tissue, and are therefore morbid growth of the closed glandular structures of the pharynx (Plate I, fig. 7 and fig. 8). They vary in form and consistency, sometimes being solid and firm, and at others, soft, highly vascular, and prone to bleed. They are described in one case as giving the finger the sensation 'of *soft masses,* which, giving way to the finger, felt very much like a bunch of earthworms, and, hanging down from the roof of the pharynx, completely closed up the posterior nares. There was rather free bleeding during and for some minutes after this digital examination.' The presence of these vegetations in any quantity impedes respiration through the nose, and gives a peculiar 'deadness' to the articulation and sounds of certain consonants, *m* being pronounced like *b*, and *n* like *d*, so that 'moon' is pronounced 'bood,' 'common' is pronounced 'cobbod,' and 'nose' 'loze' or 'doze.' There is also some degree of deafness, if the vegetations encroach upon the Eustachian tubes.

The mouth is kept open continually, 'the nostrils are flattened, so that the nose appears compressed, and the patients have a peculiar way of pouting or twisting their lips, toying with them as it were.'" Dr. Meyer finds the rhinoscope sometimes useful in detecting these growths; but, if it is not available in consequence of peculiar formation of the pharynx or irritability of the soft palate, he employs digital exploration, and the elongated growths can then be felt along the sides of the posterior nares and pharynx. He uses the ring-shaped knife to remove them, passing it along the floor of the nose and manipulating it so that it scrapes off the tumours; or, if they are not sufficiently large or prominent to allow of this, he uses repeated applications of lunar caustic. The results of treatment thus carried out are very satisfactory. It is, however, necessary after each operation to examine the parts carefully by means of the rhinoscope or with the finger, and, if necessary, to repeat the proceedings again and again until all the vegetations are removed. In applying the caustic to this region Dr. Meyer recommends metal holders, the ends of which are bent and flattened out to suit the particular case. They are prepared for use by warming the flat end of the metal and dipping it into fused nitrate of silver. The naso-pharyngeal douche (Weber's) is used after the cauterization to inject a solution of common salt or bicarbonate of soda (1 part in 500), in order to wash away the superabundant mucus and excite a more healthy action. In very obstinate cases Voltolini's galvanic cautery should be resorted to.

This affection is most common between the ages of 5 and 15. It is not more common among the poorer classes than among those better circumstanced. There were few indications of struma, past or present, in the cases observed by Dr. Meyer. He regards local irritation as having some influence in the development of adenoid vegetations. Judging from the fact that the characteristic defect of speech is less common after a certain age, it is probable that these growths undergo spontaneous disappearance or shrinking in the course of time.

Subsection 8.—*Gelatinous or Mucous Polypi.*

These growths form a class intermediate between the simple hypertrophy of the mucous membrane and the tumours springing from it. They may, in fact, be regarded either as local hypertrophies of the mucous membrane and submucous tissue, or as sarcomata of the submucous areolar tissue, with the addition in some cases of being adenomata of the mucous membrane itself. Their most common seat is the lower part of the middle turbinated bone, but they may, in fact, spring from any part* of the nasal fossæ or their sinuses, though there is no recorded instance of a mucous polypus growing from the septum nasi, except one specimen in the museum of St. Thomas's Hospital (Section I. 3.) They vary in form, but for the most part are attached to the mucous membrane by a narrow pedicle or neck, and have the free extremities bulbous or pear-shaped. They may be lobulated, or in a single pear-shaped or oval mass, and their size may vary from that of a pea or smaller, to the size of a walnut or even larger. The surface is smooth, moist, and covered with a continuation of the mucous covering of the nasal fossæ, but their aspect, when seen from the anterior nares, is different from that of the normal mucous membrane. They have a semi-transparent greyish yellow colour, with a tense distended appearance, as if from being full of serum, though with a certain proportion of vessels ramifying upon them. When touched they do not easily bleed at their free extremities, but the attached pedicle is very vascular, and bleeds when touched or pulled. There are generally several in the nostril at the same time, very seldom a single one by itself. If they are attached near the anterior nares, they in process of growth make their appearance at the orifice, or they distend the nostrils, and press them outwards, encroaching upon the adjacent bones and pushing the walls of the antrum before them, distending the whole of the upper part of the face and cheek, and

* See Plate III, fig. 7, in which a polypus is seen hanging down from the frontal sinus; and Plate III, fig. 4, where there is polypus springing from the lip of the orifice of the antrum of Highmore.

producing a hideous deformity of the features quite characteristic of intra-nasal growths (though not specially of mucous polypi), which is known by surgeons as the "frog face." Lastly, if attached further back, these growths encroach upon the pharynx and block up the posterior nares, hanging down even below the level of the soft palate.

Minute Structure.—There are two varieties, 1. the simple sarcoma* of the submucous tissue, overspread by mucous membrane with pavement epithelium with vibratile cilia; and 2. the adenomatous form. These latter have the mucous glands of the part very much multiplied and hypertrophied, and in them also there is a great increase in the submucous areolar tissue. The mucous surface is in this variety also covered with ciliated epithelium. In both there is an ædematous condition of the areolar tissue, of which they are principally composed. They are sometimes cystiform, the soft gelatinous or semifluid interior being hollowed out into one or more areolar spaces, but this is an exceedingly rare condition in the simple mucous polypus. They are sometimes called *vesicular*, but this name is applied equally to both varieties. It is not difficult to account for their shape and pendulous condition. Being composed in great part of serous fluid, there is a constant tendency for this fluid to gravitate to the bottom of the growth; and the neck is stretched, compressed, and narrowed by the extension thus made on it. The shape of the nasal fossæ also favours the production of the pear shape, there being more room for expansion at the lower part of the cavity than above.

The section of a simple mucous polypus is semi-transparent, as if the meshes of the areolar tissue were filled with clear serum, but in a few cases, there is also a more opaque tissue occupying some portion of the growth, and this is more particularly observed in those in which the polypus has recurred

* The use of the term "sarcoma" to describe the gelatinous form of polypus is in the sense of its being a hyperplasia of a normal simple tissue, as distinguished from the more complex growths developed in glandular structures.

again and again after removal. Dr. John Harley kindly examined a tumour of this kind removed by me at King's College Hospital, in July, 1864. The opacity of a part of the growth in this case was due to the organization of the fine molecular matrix in which the ordinary mucous corpuscles are embedded. The microscopic structure was the same in the opaque white parts, and in the transparent jelly-like parts, being composed of round or oval, granular, sometimes polynucleated corpuscles, of the average diameter of $\frac{1}{3000}$ of an inch. They are separated by intervals of less than half their width (fig. 8 on Plate IV), being embedded in a faintly granular or faintly fibrous matrix. On loosening the corpuscular mass, the granular matrix is found to envelope the corpuscles, and to be separable into soft fusiform fibres, in the centre of which the corpuscles lie, forming distinct nuclei to them. The diameter of these fibres is at their widest part a little more than that of the corpuscle. The attenuated extremities of the spindle-shaped mucous fibres are often prolonged into clear homogeneous structureless membrane; the fibres measure the $\frac{1}{8000}$ of an inch. (Fig. 8, Plate IV.) (See Case III in Appendix.)

A third variety occasionally occurs in the form of small papillomata (soft warts), but these are exceedingly rare, unless indeed the early stage of the ordinary polypus appears under this form. (Billroth's "Surgical Pathology and Therapeutics," p. 616.)

Symptoms.—The first symptoms are similar to those of a slight nasal catarrh. The patient experiences a feeling of fulness and discomfort in the nostril affected, and he feels a constant desire to expel something that obstructs his breathing and the free current of air through it. He has continual snuffling respiration, the sense of smell is deadened, and the voice becomes nasal in character. By and by the nostril becomes completely obstructed, and then the finger passed up meets with the polypus, which is now also visible on inspection by the surgeon. If both nostrils are equally affected at the same time, the obstruction to breathing is very inconvenient, and the patient is obliged

to keep his mouth constantly open; but, as a rule, the obstruction is not allowed to involve both sides without some surgical aid having been rendered in time to prevent this. If the growth increases, it may obstruct the nasal duct, and a lachrymal abscess then forms and bursts on the cheek, or at least the tear passage becomes so much obstructed that there is constant overflow from the eye on to the cheek (epiphora), and very possibly mucocele of the lachrymal sac. When the patient blows his nose violently, he can force the growth lower down towards the orifice of the nostril, and by a deep inspiration those polypi that are nearest the posterior nares may be drawn down into the pharynx. They become less bulky in dry warm weather, and more so in cold and damp weather; so that the patient experiences much more discomfort in the latter, and great relief in the former. They are not accompanied by pain, and grow very slowly. They give rise, however, to great discomfort, especially in the impediment to respiration and the loss of smell with which they are accompanied, and occasionally deafness is added to the other discomforts.

Epistaxis is an occasional symptom, and sneezing is apt to occur in sudden changes of temperature of the air.

In the very advanced stages, the extension of the growth may obstruct the free passage of the tears down the nasal duct; and, still later, may press upon the contents of the orbit, and thrust the eyeball partly out of its normal position, causing exophthalmus.

An unusual effect of the long continuance of polypi is to cause thickening of the nasal bones and cartilages, as well as their lateral expansion. In a large nasal polypus operated on by Sir W. Fergusson, at King's College Hospital, and recorded in the *Medical Times and Gazette*, for October 19, 1867, this unusual thickening of the bones and cartilages was remarked upon by Sir William, as being an exceedingly rare condition. As a rule, they are very much thinned as well as expanded.

Diagnosis.—The above detailed symptoms lead to an almost certain conclusion, that we have to deal with a mucous polypus,

but rhinoscopy, generally of the anterior nares only, without any aid from the speculum, will make the matter clear to a surgeon who is familiar with the appearance of these growths. The greyish yellow or greenish shining surface projecting from the upper part of the nares is unmistakeable in most cases. But there are a few occasionally seen in the early stage in which it is not so easy to say at once whether the growth is a mucous polypus, or one of a fibro-sarcomatous nature. The latter, however, are generally more dense-looking, of a deeper tint, and firmer to the touch. The simple mucous polypus when touched by the probe lightly, dimples and at once returns to its former shape, yielding before the probe as if soft and elastic; whereas the fibro-sarcomatous polypus when touched, offers much more resistance, and is very likely to bleed.

A chronic thickening of the mucous membrane covering the lower turbinated bone sometimes simulates polypus. This will be distinguished after thoroughly cleansing the part with the syringe, by observing its red colour and dense aspect; and by passing a probe along its attached border it will be found to extend a considerable distance into the nostril, and to have no narrow pedicle, such as is almost invariably the case with mucous polypi.

Other growths, such as malignant, osseous, or cartilaginous tumours and foreign bodies will be distinguished by their colour and hardness, as well as by the previous history and present condition of the patient.

Cases of distension of a portion of the ethmoidal cells by mucus, may sometimes present to the eye the appearance of mucus polypi. Two specimens in St. Thomas's Hospital Museum illustrate this point of diagnosis ("Museum Catalogue," Section I., Nos. 14 and 15). In the first is seen "immediately above the foramen into the antrum, a smooth, rounded, convex projection from the roof of the middle chamber; a section through this prominence has been made, showing it to depend simply upon an enlargement of one of the posterior ethmoidal cells."

In the second specimen, "projecting from the roof of the middle

chamber at the anterior part, is a smooth, regularly convex, oval tumour, measuring seven lines in its long diameter, and four lines in breadth. This tumour was considered to be of the nature of ordinary polypus of the nose, but is shown on section to depend simply upon an enlarged and dilated condition of one of the anterior ethmoidal cells."

The diagnosis would be easily made in such cases by using the probe, when the surface would be found to be hard and resistant, and a puncture would confirm it, by allowing the escape of pent up mucus.

Abscess or blood tumour of the septum, or chronic thickening of this part, may occasionally so far obstruct the nostril, that it is at first difficult to ascertain where the swelling springs from. It will be better, under such circumstances, to use a probe as an aid in diagnosis, and by passing it around the swelling, it will be ascertained that the base is broad and comes from the inner wall of the fossa. It is besides of a red colour in the early stage, and later on the associated heat and pain of the surrounding parts point distinctly to inflammation as the cause of the swelling.

Besides ascertaining the nature of the polypus, it is important if possible, to ascertain exactly its point of attachment. This can only be done by passing up a probe, curved to any form thought most convenient, and endeavouring to hook it round the pedicle; where it meets with resistance it is evident that that is the point at which the polypus is attached.

It is also well to ascertain whether there are several polypi or only a single one. Posterior rhinoscopy is very useful for this purpose, supposing the polypi are not hanging through the posterior nares into the pharynx, in which case the fingers will enable us to gain the information we require; passing the forefinger through the mouth, and hooking it rapidly round the soft palate, we are often able to distinguish one or more polypi projecting from the posterior nares, and the examination of the nostrils anteriorly will give us the further information as to whether those projecting posteriorly are the only ones or not.

Treatment.—Various dessicative applications have been used for the purpose of drying up the smaller varieties, and in the early stages they have an undoubted efficacy. Mr. Bryant has employed finely powdered tannin for this purpose with great success, and Mr. Banks, of Liverpool, also speaks highly of this method of treatment. The powder is blown into the nostrils by means of a small tube to which an india-rubber ball is attached the urethral injection ball for this purpose answers well, and the insufflator of Rauchfuss (fig. 10) still better. It is probable that the small vesicular polypi, and those of a papillomatous nature are the varieties in which this method of treatment has been successful; and in all cases in which the tumour is small and soft, there is every prospect of a temporary relief, if not of a permanent cure, by steadily using the tannin powder for a few weeks, two or three times a-day. If, however, the polypus has attained to any size, it becomes very difficult to apply powder efficiently, and we must then resort to more decided measures.



Fig. 10.

Tearing away the polypus by means of the forceps is a safe and efficient measure, taking care to seize the neck or pedicle as close as possible to its attachment and twisting it off at this point. Very free bleeding always follows, but this is easily arrested by syringing with cold water, or even by causing the patient to snuff up water by forced inspirations.

The snare devised by Mr. Hilton (and founded on Toynbee's snare for polypi of the auditory meatus) (fig. 11) is also a very

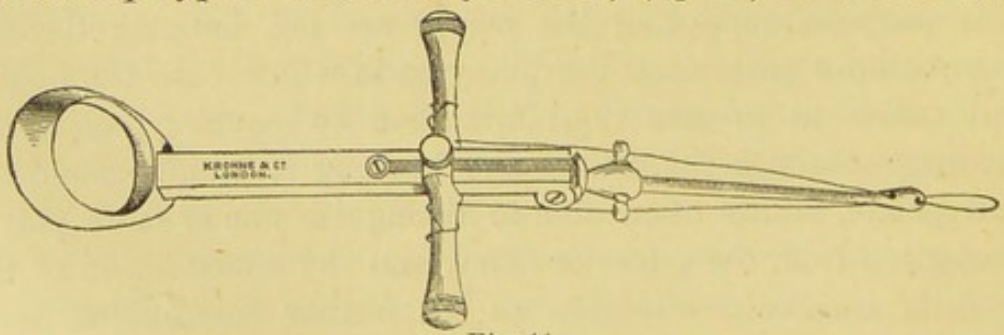


Fig. 11.

good instrument, but requires much skill in management. In

order to get the loop of wire* well up round the pedicle of the polypus, it is necessary to ascertain the point of attachment very accurately, and then to guide it over the bulbous extremity, pushing it well home by means of a fork-shaped guide. The pedicle can then be strangulated by tightening the wire loop; and if this is done slowly and cautiously, the bleeding may be reduced to a mere nothing. In the case of polypi presenting through the posterior nares and hanging down into the pharynx, it is necessary, as a preliminary step, to get the loop of the wire snare through the floor of the nose into the pharynx, and to draw it into the mouth by means of the finger passed behind the soft palate, or by catching it with a pair of forceps as soon as it appears in the back of the throat. A still better method, however, is—(1) to pass Belloc's sound, the eye of the stylet of which is armed with a stout silk thread, through the nares; (2) to seize with forceps the thread as soon as it appears in the pharynx and draw one end out of the mouth; (3) to withdraw the sound through the nose, bringing with it the other end of the thread; (4) To attach the nasal end of the thread to the wire loop of the snare, and by pulling upon the end of the thread hanging from the mouth, draw it along the floor of the nares into the pharynx. Though this description is somewhat long, the actual performance of these manœuvres is a matter of a very few seconds, provided no unusual difficulties present themselves. The loop is then slipped over the polypus and the wire withdrawn into the nasal fossæ. A ligature then passed through the pharyngeal end of the polypus and brought out at the mouth will facilitate its removal after the pedicle has been cut through by the wire; but if this cannot be accomplished, it may be allowed to fall down into the pharynx, and will then be coughed up through the mouth. If within easy reach from the mouth, the cork-crew shaped tractor (fig. 12) is a useful means of seizing and extracting the polypus from the mouth, and the



Fig. 12.

* The strongest and most convenient wire is made by twisting two or three strands of annealed steel wire into one thread; but for many purposes stout silver wire answers very well.

same instrument may be employed with advantage in dealing with polypi, whether by the forceps or the snare from the anterior nares. It has some advantages over the beaked forceps: 1st, it occupies less space, and does not interfere with the view of the parts; 2nd, it holds more firmly and can be made to twist the tumour on its own axis by a simple movement of the operator's fingers, the movement by means of forceps necessitating a much firmer grip and being more likely to slip away during the twisting manœuvre.

The toothed scissors lately introduced by Dr. Richardson promises to be a very useful auxiliary in the removal of polypi and other growths from the nostrils, an important qualification being its capability of making a bloodless section of the parts. But the same object can be attained by scissors, the edges of which have been blunted, so that they divide the parts by bruising and tearing rather than cutting, and in the case of gelatinous polypi the pedicle is so easily torn through that there is no need for the great strength and cutting power with which the saw-toothed scissors are endowed.

By whatever method the polypi have been removed there is always a possibility that some portion of the pedicle or some smaller lobules remain behind. As soon, therefore, as the bleeding has ceased, the nasal fossæ should be thoroughly washed out by means of the douche syringe, and the region to which it has been attached carefully examined. Any smaller growths should then be touched freely with lunar caustic, either by means of the ordinary caustic holder or the jointed caustic holder (Earle's), and the pedicle treated in the same way. For the purpose of applying caustic to the posterior nares, a curved iron wire coated with a film of nitrate of silver is the best instrument, and if the pharynx is suitable for the use of the rhinoscope, its aid should be called in for the performance of this delicate operation. Subsequently the occasional use of finely powdered tannin, by means of the insufflator, will suffice to prevent any growths that are beyond the reach of caustic from taking on an active growth, and we may thus succeed in causing them to

shrivel up entirely, and rid the patient of a very troublesome malady.

Sometimes polypi of very considerable size have been reduced to very small dimensions, and even destroyed by the use of powerful astringents. A very interesting instance of a case of a large polypus hanging behind the uvula in the throat successfully treated by the injection of a solution of perchloride of iron through the anterior nares, is recorded in the *New York Medical Record*, of October 1st, 1868. (See Case LIV in the Appendix.)

The description so far given of the treatment refers only to the more numerous class of cases met with in practice in which the polypi have only attained such dimensions that it is possible to reach them through the normal apertures of the nasal fossæ, either in front or from behind; but it every now and then happens that the disease has been allowed to go on to such an extent that the whole of the tissues, including the surrounding bones, have been thrust out and distended in every direction, the whole cavity being occupied by a closely-packed mass of lobulated polypi, some portions of them protruding from the nasal orifices in front and others hanging down in the pharnyx. Even under these circumstances it is well to attempt the removal of the mass without dividing any of the tissues with the knife; and if the ordinary polypus forceps cannot be introduced through the anterior nares, a pair with separable branches, jointed like the ordinary midwifery forceps, may be used; each branch being passed separately, and the two united at the joint after they have been adjusted to the proper position with their points at the pedicle. A portion of the mass having been torn away, even though the whole of the polypus seized may not have come away in the first attempt, more room will be available for subsequent attempts, and in this way very large mucous polypi have been extracted. In a similar case the toothed scissors (made smaller in the blade than those generally used by Dr. Richardson, and curved "on the flat") would be admirably adapted for the removal of the presenting or accessible portions of the tumour, and the instrument could then be thrust up higher into the

nostrils and the attached portions divided. A pair of scissors for this purpose, made for me by Messrs. Krohne and Sesemann, are equally adapted for use in this more formidable class of cases and for the simpler and smaller growths.

It is very rarely necessary for the removal of mucous polypi, however large, to enlarge the anterior aperture of the nares, but if it is found impossible to reach them by any of the means mentioned in consequence of their having expanded the bones and become almost embedded in the upper jaw, encroaching upon the antrum in their progress, then the division of the ala in the line of the sulcus near the cheek will give a good deal more available space. The resulting scar after this operation is insignificant, and the proceeding does not add anything to the dangers or difficulties of the case. Dr. Thudichum, in order to make room for the introduction of instruments, dilates the nostril by introducing into it as many strips of *laminaria digitata* as are required to fill it. They swell up by the imbibition of moisture and effect a gradual distension of the cartilaginous parts. He also advises in some cases forcible dilatation by means of strong forceps made somewhat in the form of Liston's speculum. (See *Lancet* for Sept. 5, 1868.) It has been found necessary, when very large polypi are situated very far back in the nostrils, to make a button-hole opening in the soft palate and draw the polypus down through it into the mouth. Such a case occurred to M. Manne, a surgeon of Avignon, in 1747. The polypus filled the nostril, projected into the fauces, and completely closed the opening of the nares in front. Manne attempted to extirpate the posterior mass, but the soft palate, tightly distended by the tumour, presented invincible obstacles to his doing so, so that he determined to lay open the soft palate in the median line. He then cut off several portions of the tumour, and passed threads through the part remaining. By pulling on the threads at the same time that he pushed it forwards with his fingers in the fauces behind the mass; he at length broke through the pedicle, and the noise made by its sudden escape through the aperture was like that of drawing a cork out of a bottle. A second

polypus showed itself soon after; this was removed and the cure was complete. The method of removing polypi simply by means of the fingers has been practised by Morand and Sabatier, and also by Professor Gross. One finger is passed into the nostril in front and another through the posterior nares behind, and by alternately pushing backwards and forwards the pedicle at length gives way. The cases of large firm growths are those most suitable for this proceeding, and it cannot be applied as a rule to mucous polypi, nor to those that are attached high up in the nares, nor to those with very broad or very firm pedicles. Professor's Gross's case was one of a large gelatinoid polypus, with a very narrow foot-stalk (attached to the posterior extremity of the inferior spongy bone), which was therefore easily torn asunder. This, therefore, was an exceptionally favourable case for this method of treatment.

Various other methods of snaring, ligaturing, cauterising, and burning off polypi are described by authors, some of which will be referred to in speaking of the fibroid and fibrous growths that are occasionally found in the nostrils and naso-pharyngeal region, and to the treatment of which they are more especially applicable.

Description of Plate I.

Fig. 1. An imaginary section through face to the left of the median line, showing the position of the palate hook, and faucial mirror *a, b, c,* the turbinated bones; *f,* section through the leftfrontal sinuses; *p, u,* palate and uvula drawn forwards by the palate-hook; *k k, x y,* the position of the faucial mirror, the line of sight showing the angle at which it is necessary to incline the former, in order to obtain a view of the posterior nares.

x′ y′ a faulty position of the mirror by which only a view of the roof of the pharynx would be obtained.

t, section of the tongue.

p h, section of the cavity of the pharynx.

d, orifice of the Eustachian tube.

n, section of the left nasal bone (after Czermak).

NOTE.—The head is represented erroneously as being thrown backwards. It should be erect, or nearly so.

Fig. 2. A rhinoscopic view of the posterior nares, showing the superior and middle meatus, the turbinated bones and the orifices of the Eustachian tubes (after Czermak.)

Fig. 3. A portion of the lining membrane of the antrum, near its orifice of communication with the nostrils, after preparation by soaking in dilute nitric acid; the glands are seen as described in the text (magnified 2 diameters (after Giraldès).

Fig. 4. A gland from a portion of the same (magnified 60 diameters) (after Giraldès).

Fig. 5. A portion of a gland from the same (magnified 80 diameters) (after Giraldès).

Fig. 6. Rhinoscopic view of the posterior nares and of the velum palati, on the side (R) the orifice of the Eustachian tube is seen, which, on the other side (L) is covered by two tumours (after Czermak).

Fig. 7. Adenoid vegetations in the naso-pharyngeal cavity, cylindrical vegetations on right lateral wall of the naso-pharyngeal cavity, covering the opening of the Eustachian tube; remains of vegetations after operations on fornix and left lateral wall (after W. Meyer).

Fig. 8. Microscopical view of a section of the adenoid vegetation from the fornix in the case represented in fig. 7 (magnified 300 diameters) (after Dr. W. Meyer.)

Plate. 1

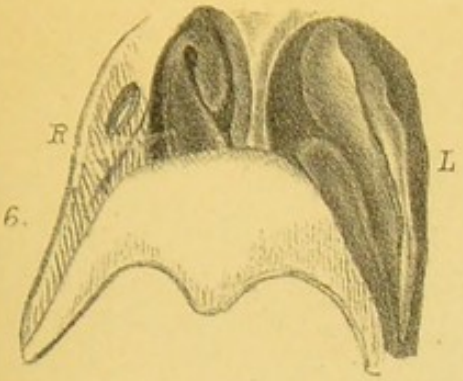


Fig. 6.

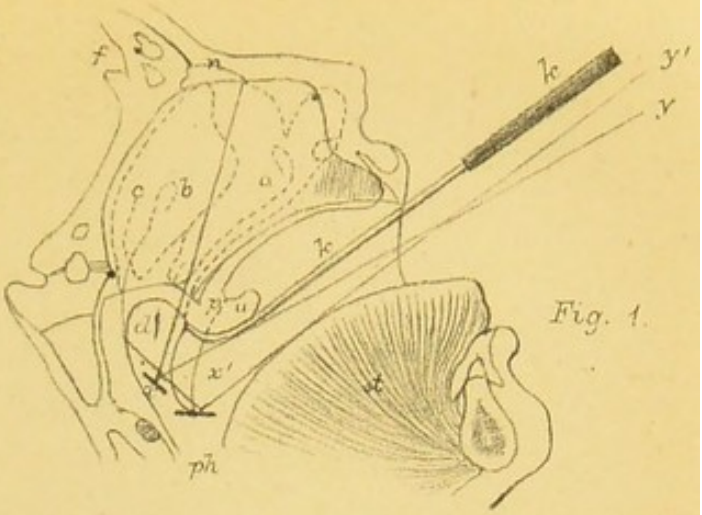


Fig. 1.

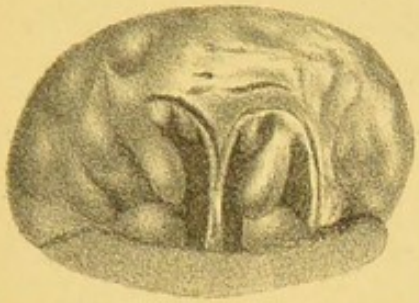


Fig. 7.

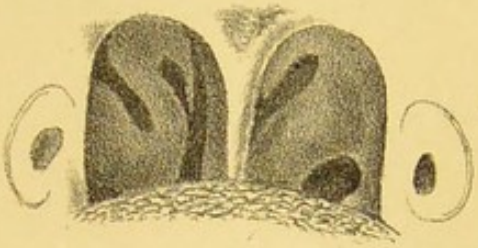


Fig. 2.

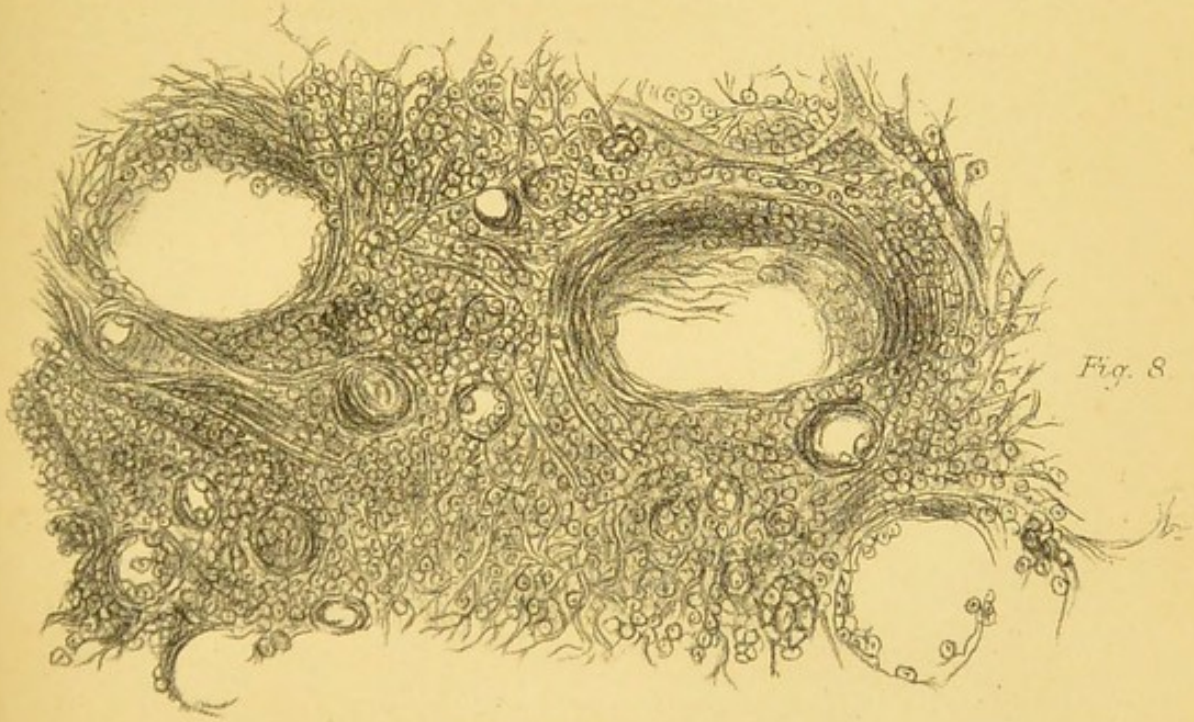


Fig. 8.



Fig. 3.



Fig. 4.

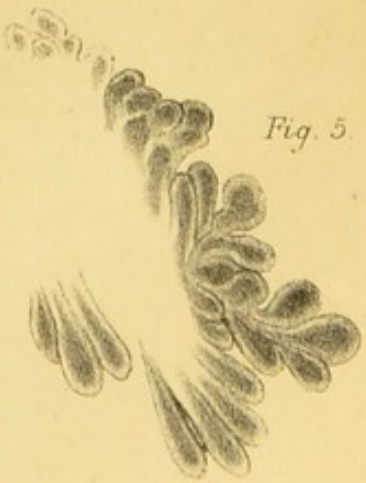


Fig. 5.

W. West & Co. lith.

SECTION III.

Ulcerative Diseases of the Mucous Membrane of the Nasal Fossæ.

Subsection 1. Ozæna.

„ 2. Erosive Ulcers of Syphilitic Origin.

„ 3. Lupoid Ulcers.

„ 4. Eczematoid Ulcers.

„ 5. Ulcers as the Sequelæ of Fevers.

„ 6. Glanders.

„ 7. Ulcers of Traumatic Origin and Foreign Bodies.

„ 8. Scorbutic Ulcers.

„ 9. Ulcers in Paresis of the Fifth Pair of Nerves (Neuro-paralytic Ulcers).

SECTION III.

Ulcerative Affections.

Subsection 1.—*Ozæna.*

Whenever the nasal secretions become fœtid the patient is said to have ozæna. This symptom may, of course, depend upon a variety of causes, but there are certain cases in which the prominence of this over the other phenomena of the disease has made it the title of the disease *par excellence*. Whenever, therefore, we speak of a person having ozæna, we imply that there is deep-seated chronic affection of the mucous membrane of the nose, accompanied by an offensive odour from that part. Fœtid breath, whether from caries of the teeth, from abscesses around the fangs of the teeth, ulcers of the gums, chronic tonsillitis, caries or necrosis of the jaws, mercurialism, or other causes unconnected with the nasal cavities must not be confounded with ozæna. The stench of ozæna is quite as strong when the mouth is shut as when it remains open, and may be even more powerful, whereas this is not the case with the conditions just referred to. In all cases of ozæna, the odour emitted is peculiar and quite different from that arising from any other cause. It is called by the French "Punaisie," and this name indicates, in some respects, the kind of stench that it resembles. It is so horribly disgusting in the worst cases, that the air of the room in which a patient so afflicted is present, becomes unendurable to those whose olfactory organs are sensitive, and even the most callous noses cannot remain within a yard or two for more than a few minutes.

There are several varieties of this condition :—

1. There is the *accidental* or *simple ozæna*, due to the reten-

tion of mucus or mucous crusts in some of the cavities of the nares in the course of an ordinary catarrh, or in strumous rhinorrhœa. These are not the cases that are most offensive. It is suggested by Trousseau, that "in some persons the nasal secretions, like the pharyngeal, vaginal and anal secretions, undergo rapid change, and acquire an excessive fœtor, not perceptible in other individuals much less particular in the observances of the toilet."

The case of simple ozæna is easily dealt with by the frequent employment of the nasal douche, and if after the removal of the crusts the breath through the nostrils becomes quite pure, we may conclude that the true cause of the stench has been rightly conjectured, and that there are no ulcerations or carious bones in the nasal cavities.

The mucous secretions of certain individuals with common coryza has a somewhat offensive odour from the first, but this must not be confounded with true ozæna, in which the odour is peculiar and much more overpowering.

2. There are many cases of ozæna which may be classified as idiopathic or constitutional. This kind commences in early childhood, but does not become pronounced till about puberty, and remains during the early years or throughout the whole of adult life. The sickly, nauseating smell is very disgusting, and renders the presence of the patient unendurable to those about him. The patient is generally anosmic, or partly so, the sense of smell being very frequently destroyed by the progress of the disease, and he is, therefore, unaware of the offensive odour of his breath. The secretions from the nostrils are purulent, or in crusts with occasional sanious flow on detatching the crusts. The anterior nares are found to be red when examined by the speculum.

The aspect of the patients is generally that of some constitutional delicacy. The family history shows that there is some hereditary or family tendency to phthisis, and in a few cases lupus is present either in the same individual, or in one of the relations.

From the fact that a flat bridge to the nose (*nez écrasé*) is often met with in connection with ozæna, and also from the circumstance of anosmia being a very frequently associated condition, it has been supposed that this constitutional form of the disease is due to a chronic affection of the mucous membrane high up in the nasal fossæ, involving the olfactory region, and leading in some cases to an atrophy of the bones in the neighbourhood, either the vertical plate of the ethmoid, or the ethmoidal cells, or both, in conjunction with softening of an inflammatory kind of the cartilages in their neighbourhood. The nature of the inflammatory process is very probably allied to that of lupus erythematosus of the face. We occasionally meet with chronic lupus of the face in connection with ozæna; and often in persons whose constitutional aspect resembles that of lupus, and whose family is phthisical in its history, even though lupus may not have developed itself superficially, there is the suspicious presence of ozæna. We conclude, therefore, that lupoid degeneration with shrinking of all the tissues, bones and cartilages included (such as we see in lupus of the integument), is the condition of the deep-seated parts of the nasal fossæ in constitutional ozæna so called, but which might perhaps with more propriety be called cachectic, or even lupoid ozæna; though the latter term might be considered to be based upon insufficient grounds until pathological research has confirmed the conjectures of clinical observers. That there are some persons afflicted with ozæna in whom the health is perfect, in whom there is no nasal discharge, no flattening of the nose, and no sign of inflammation or necrosis or caries, is affirmed by Trousseau, and I am not prepared to deny the possibility of such cases being found. In such instances, we must attribute the foul smell to constitutional peculiarity in the secreting function of the individual, and hence it is proposed by Trousseau to restrict the term "constitutional ozæna" to cases of this class. In almost all these cases, however, there is *anosmia*. This symptom, even by itself, indicates some mischief in the olfactory region, and hence we must not conclude

that there is no disease of the mucous membrane, even though the discharge may be so slight as to be unnoticed, and the hyperæmia and other changes be unobservable by anterior or posterior rhinoscopic observations.

The recent observations of Dr. Rouge, of Lausanne, embodied in a pamphlet entitled "Nouvelle Méthode Chirurgicale pour le traitement Chirurgical de l'Ozêne, Lausanne, 1873," throw some doubt upon the possibility of true ozæna being present without some affection of the bones. He is of opinion that it is impossible to have "punaisie" without some lesion of the skeleton of the nasal cavities, basing his views on the following considerations:—

(1.) The pus proceeding from ulcers or caries of the bones in other parts of the body have a fœtid odour, whereas the suppuration of mucous membranes generally gives rise to no odour but that of laudable pus. The exceptions to this rule are the abscesses in the neighbourhood of the anus, the vulva, and the tonsils, and these are explicable by reference to the neighbouring parts or by anatomical considerations. As for abscesses in the mouth, a carious tooth or diseased sequestrum will ordinarily explain the fetor of the pus contained in them.

(2.) The pus of an abscess of the septum nasi has only the characters peculiar to abscesses elsewhere.

(3.) After the removal of nasal polypi, the nasal breath has no peculiar or disagreeable odour.

(4.) After temporary dissections of the superior maxilla, it has never been pointed out that ozæna has been present.

(5.) No fetor has been observed in the ulcerations of the pituitary membrane in the workmen who make arsenical wall-papers, nor in those exposed to the vapour of chromic acid.

(6.) In glanders and farcy, the ulcerations of the pituitary membrane have only the odour of suppuration; though in chronic farcy ozæna manifests itself if the bones become carious or necrosed.

(7.) There is no fetor from the ulcers of the Schneiderian membrane following typhoid fever, small-pox, measles, or scarlatina.

(8.) Foreign bodies in the nasal fossæ only give rise to punaisie, if their presence determines and excites a lesion of the bones.

(9.) If it is often impossible to find the actual lesion in the osseous parts, that is due to our imperfect means of examining the parts. Dr. Rouge himself has always found an alteration of the bones in the cases of ozæna operated on by him according to his particular method. (See *infra.*)

(10.) The bones in the nasal cavities are especially liable to be exposed by ulceration, and in the diseases in the course of which, and at the period of life in which ozæna is most frequently observed, the bones generally are especially prone to become diseased.

3. *Syphilitic Ozæna* is the most common form. It depends upon tertiary syphilitic ulcers of the mucous membrane, often demonstrable in the anterior nares, and sometimes in the posterior. These ulcers may be preceded or followed by caries or necrosis of the bones, and the stench is then more horribly sickening than in any other form of this disgusting malady.

Among the less common, but possible causes of the same symptom, are eczematous inflammation of the mucous membrane, cancerous, or scorbutic ulcers, necrosis, as the result of injuries or the presence of foreign bodies, and ulcers or retained secretions with or without necrosed bone in the antrum Highmorianum or frontal sinuses.

Mr. Cæsar Hawkins (see "Contributions to Pathology and Surgery," vol. i, p. 228) is of opinion that ozæna (using the term in its most comprehensive sense so as to include all kinds of ulcers, or inflammations of the Schneiderian membrane, with or without a fœtid discharge) may be caused by inoculation from any animal poison, whether "from glanders or from inoculation with putrid and foul meat. The consequence of this state of system is that from whatever cause it may arise, ozæna is accompanied by a variety of symptoms such as would at one time have been considered decidedly syphilitic, but which may be met with as a consequence of any poisonous or other cachectic cause whatever."

Having the authority of so distinguished a surgeon as the gentleman I have just quoted, for the great variety of causes of the disease, it is very important that we should not hastily classify our cases in one or other of the categories I have mentioned. There will, as I have often observed in my own practice, be cases to which it is impossible to give a distinctive name and classification, and we must in such cases be content with placing them under the large and comprehensive class of The Cachectic.

Subsection 2.

Erosive Syphilitic Ulcers occur during the latter stages of syphilis, *i.e.*, as tertiary symptoms; and it is of course very important to recognize the early stages of the disease, and to gain, if possible, a clear history of the primary manifestations of syphilis. We must, however, in the absence of a clear previous history, be on our guard against concluding that a case is syphilitic, as the early stage of this is not unlike that of the idiopathic ozæna.

There is some amount of pain and tenderness in the part and often a good deal of constitutional disturbance. There is a sense of stuffed nostrils, and fulness of the forehead and bridge of the nose; diminution or deprivation of the sense of smell; debility, emaciation, and irritation; nocturnal restlessness; sleeplessness; complaints of pains in the limbs, with chilliness and occasional heats and flushings. In women, at the menstrual periods all the symptoms are aggravated, and the discharge becomes more abundant and offensive.

If the ulcers are within view we may gain a good deal of information as to the true nature of the disease. Generally they are easily seen both in the anterior nares and by posterior rhinoscopic examination, and it is often noticed that they have a peculiar serpiginous outline, the spreading edge of the ulcer being lunated, and the healing edge shelving off from it into the sound mucous membrane.

These ulcers often spread down into the pharynx and over

the pillars of the fauces. When they have gone so far as to excavate the bones, or perforate the septum nasi, as they sometimes do, their appearance is still more characteristic.

These serpiginous ulcers, however, are not absolutely pathognomonic of syphilitic ozæna. The ozæna may depend upon disease originating primarily in the bones, and then a ragged ulcer with excavated edges and sloughy base will be seen in the nares; or, the ulcer may not be within view at all; or, lastly, there may be mere superficial excoriations, like the psoriasis of the mouth, which may be of truly syphilitic origin, and may give rise to chronic disease with fœtor of the breath.

The examination of the posterior nares may disclose similar ulcers of the middle or lower turbinated bones and septum, and it is probable that the same condition extends upwards to the ethmoidal cells and frontal sinuses, as well as downwards to the larynx. It is sometimes attended with headache, loss of smell, and great alteration of the voice.

The secretion of the nostrils, though at first somewhat more abundant than natural, is replaced in the later stages by the constant formation of dry greenish crusts, which tend to cause a feeling of stuffiness and obstruction. This secretion and these crusts have a very offensive and sickening odour, which is quite characteristic.

There is in the majority of these cases a history of constitutional syphilis, though in many it is impossible to trace the cause of the disease. Where, however, there is no history of acquired, it is probable that a congenital taint may be present.

The *Diagnosis* in adults must therefore depend partly upon the character of the ulcers, but also in great part upon the history and general appearance of the patient.

If in infancy there has been snuffles from a very early period, say within a few months of the birth, and with this traces of excoriations about the anus and the angles of the mouth; above all if there are the characteristic notched teeth and nebula of the

corneæ, or a co-existing keratitis interstitialis, it is almost certain that we have before us an instance of constitutional hereditary syphilis.

I am bound to say, however, that though I have seen a large number of cases of supposed hereditary syphilis in youth and young adult life marked by the above characteristics, I have not seen many of these patients with erosive ulcers of the nostrils. In many of them, however, there is a very decided flattening of the bridge of the nose. Hence it is probable that there has been disease of the cartilages in early infancy in such cases, and these are the cases alluded to in the first section as being the subject of syphilitic coryza.

In the very young infants who are the subjects of this coryza it is very difficult to ascertain whether any true ulcers have formed in the deeper parts of the nostrils, and the small size of the anterior nares rarely allows a good view of the front part of the cavity, while posterior rhinoscopy is utterly out of the question. But it is beyond question that in the worst cases of infantile syphilis ulcers and even perforating ulcers form within the nostrils, and in the later stages the bones become affected and fragments are discharged among the crusts of mucus. In these instances the discharge is frequently sanious in character and there are fissures, excoriations, and ulcers on the external surface of the nostrils. Ulcers of the throat are a frequent complication, and the larynx may even be affected, as is evident from the dull, hoarse, or even almost extinct voice of the child. Bleeding from the nostrils sometimes complicates the disease very seriously, and, if the discharge from the ulcers becomes dried up, the infant's breathing will be much obstructed by the accumulated crusts, sucking becoming an impossibility, and the nutrition suffers more and more until the child sinks and dies of exhaustion. Some of these infants with syphilitic coryza die from the absorption of the putrid gases they are constantly breathing. The discharges collecting in the nostrils become putrid, and the decomposing gases find their way to the lungs by the aid of the inspirations, the energy and frequency of which

are doubled by the obstacles that impede them, and the child is slowly poisoned by its own breath.

The *diagnosis* of the disease in infancy will not be difficult. The coryza is generally associated with some affection of the skin, psoriasis or excoriations of the anus, the hoarse voice, &c., and the parents' previous history will be tolerably clear without going very deeply into all particulars.

In the *treatment* of this disease, whether in infants or adults, the free use of the douche and the application of antiseptic solutions are as necessary as in the cases already referred to. It is, however, as well to apply, by means of a camel's hair pencil, as a preliminary to injections, a solution of carbolic acid (gr. i to 60) mixed with an equal part of glycerine. This is to be applied two or three times daily, in order to soften and detach the dry crusts. When this result has been obtained, the injection of weak iodine solutions and chlorides will be required, and in addition to these, the inhalation through the nostrils of iodized spray from a Siegle's steam spray inhaler, or of iodine vapour,* will be very useful in deodorizing the breath of the patient.

In ulcerative syphilitic ozæna in adults, one or more courses of mercury have most probably been taken during the primary or secondary stages; but if there is reason to believe that mercury has been insufficiently tried, it will be well to employ the calomel vapour bath on the plan so successfully carried out by Mr. Henry Lee, keeping the patient steadily under this treatment for three or four weeks, and directing the vapour especially to the cavities of the nostril, the head being now and then, during the time of the bath, held over the neck-opening of the cloak and the vapour inhaled through the nostrils. In this way the

* Viz., Tr. Iodinii ʒiii, water ℥iv, to be warmed and inhaled, the bottle containing the solution being placed in a basin of hot water, while the whole apparatus is surrounded by a towel arranged in a conical form, and the top of the cone being left open the patient inhales from that aperture; or a phial containing iodine or Tr. Iodinii may be employed, the heat of the hand on the outside of the phial being sufficient to volatilise the iodine; or a few drops may be put into any suitable inhaler, those made of porcelain being most appropriate.

very finely divided calomel powder becomes deposited upon the surfaces of the ulcers.

The effect of mercury, however, requires to be very carefully watched in these cases, because it so often happens that there is with the syphilitic a scrofulous taint in the constitution: this particular combination of diatheses rendering the system more liable to the ulceration of mucous membranes than either by itself; and it is well known that scrofulous persons do not bear mercury so well as those untainted with that constitutional weakness. Hence if the gums rapidly show decided signs of mercurial action, the baths should be at once discontinued, and if necessary, recommenced after an interval.

In cases in which mercury has been given freely and efficiently during the primary or secondary stages, it will be found desirable to give a course of iodide of potassium, beginning with 4-grain doses and going on to 20 or 30 grains, and combining with this sarsaparilla in the form of liquid extract. (See Case No. IV in Appendix.) If after a few days or a week of this plan of treatment there is no amendment in the symptoms, it will be better to give up specific treatment altogether, and to rely upon topical applications and the internal administration of cod-liver oil and iodide of iron. Sometimes perchloride of iron and bitter tonics will be required alternately with the cod-liver oil; and in all cases, whether specifics are given or not, a supporting regimen should be made a *sine qua non.*

M. Trousseau speaks very highly of topical applications in the form of finely divided powders blown into the nostrils, after they have been thoroughly cleansed by the use of the tepid douche and all the crusts have been removed. The powders may be used as snuff or blown up the nostrils by the insufflator.

The following formulæ are given by M. Trousseau for powders used by him as snuffs (Trousseau, "Clin. Med.," vol. iii, p. 67, "Ozæna"):—

No. 1. Subnit. Bismuth
Venetian Talc. . . equal parts.

No. 2.	Carbonate of Potash .	30 grains.
	Sugar in fine powder .	232 grains.
No. 3.	White Precipitate .	$3\frac{5}{6}$ grains.
	Sugar in fine powder .	232 grains.
No. 4.	Red Precipitate . .	$3\frac{5}{6}$ grains.
	Sugar in fine powder .	232 grains.

The mercurial powders are to be used twice or thrice daily, but their action requires watching; as, if too frequently repeated, they excite much more irritation than is at all desirable. The occasional wonderfully rapid effects of a single pinch of one of these powders in removing fœtor is emphatically remarked on by M. Trousseau. There can, however, be no doubt of the superiority of the calomel vapour bath over this method.

In the treatment of ozæna in children the use of powders would be very difficult, but with the aid of Rauchfuss' insufflator (fig. 10) would not be impossible. In the case of children, I find the mercurial ointment more manageable than any other preparations, and in most cases very effective, provided sufficient attention has been given to cleansing the nostrils of crusts previously by the use of the syringe.

M. Trousseau prefers injections for children, and specifies the following four as those most likely to be serviceable:—

No. 1.	Eau Phagédénique, or Yellow Wash, *i.e.* Corrosive Sublimate . . .	1 grain to 1 fluid-ounce of Lime Water.
No. 2.	Chlorate of Potash . .	5 grains.
	Distilled Water . .	1 fluid-ounce.
No. 3.	Nitrate of Silver . .	5 grammes.
	Distiiled Water . .	100 grammes.
No. 4.	Sulphate of Copper . .	24 grains.
	Distilled Water . .	1 fluid-ounce.

The strength of No. 3 Solution is much greater than is ordinarily used under such circumstances, and represents, in our measure, about 24 grains to the fluid ounce. Such a solution

would, in my opinion, be highly irritating, not only to the ulcers themselves, but also to the sound parts of the mucous membrane, and even to the skin of a young infant. It is better, therefore, to commence with a solution of about 5 grains to the fluid ounce, and, if necessary, to increase its strength by degrees. If the ulcers are within reach, I much prefer to apply the lotions by means of a camel's hair pencil, as by this plan the diseased parts only are stimulated, and the adjacent mucous membrane is not irritated; but if this be impracticable, as it often is, the weaker solutions, or the ointments above mentioned, are more manageable and generally quite as efficient.

Caustics as a rule may be safely used in the form of the mitigated nitrate of silver sticks, suitable caustic holders with long flexible stems being best adapted for this purpose, and I much prefer this plan, or the use of a sponge on a long stem, to the employment of strong solutions of nitrate of silver for the reasons above mentioned.

Inunction with mercurial ointment, or the administration of mercury in some form, is sometimes required in the ozæna of syphilitic origin in young infants. In some of the worst cases of ulceration remarkably good results occasionally show themselves, even though the constitutional taint has not been clearly established (see Case No. V in Appendix), after the exhibition of mercury.

In case of bone disease being satisfactorily made out, it will become a question whether any operation for the removal of sequestra can be safely undertaken, but the consideration of this point is deferred to a later section (see p. 124).

Subsection 3.

Lupoid Ulcers are probably present in some cases of ozæna, occurring in persons of a tuberculous or phthisical constitution, and it becomes a point of great importance in practice to distinguish between these cases and the true syphilitic ulcers.

The *diagnosis* is important on social grounds as well as

for medical and scientific reasons, and is of importance to the patient under both aspects. Many of them are young women, of ages varying from fifteen to thirty years, to whom the smallest suspicion of a venereal taint would be a great misfortune, beyond and beside that of the miserable disease under which they are labouring. Hence the greatest caution is necessary in forming or expressing an opinion under such circumstances. The presence of marked phthisis or tuberculosis, or of lupus in anyone of the family will afford a strong presumption in favour of the view that the ozæna is dependent upon lupoid ulcers, and the character, standing, and past history of the patient will confirm or throw doubt upon the probability of this being the correct diagnosis.

Lupus of the conjunctiva is not a very uncommon malady. A case of the kind was recently under my care at the Central London Ophthalmic Hospital, in which a distinct and separate lupoid ulcer was present on the conjunctiva, associated with similar ulcers on the skin of the nose and cheek; and Arlt has recorded cases of *primary lupus* of the conjunctiva. There is, therefore, no great improbability in the occurrence of the same kind of ulceration within the nostrils,* though from their situation it may be difficult to discover their position or recognise their form. Though, however, we may assume that some cases of ozæna in young and delicate adults, and especially in young women, are true instances of lupus, it is also not uncommon to meet with cases of a mixed kind, viz., of lupoid ulceration engrafted on a syphilitic constitution, or of a combination of phthisical and scrofulous dyscrasia in the same individual, and the symptoms of the disease will be modified in accordance with each of these constitutional peculiarities. In all the varieties of this disease, its obstinate continuance in spite of all remedies, offers a strong presumption in favour of the case being of the lupoid variety.

* Virchow mentions, as examples of isolated foci of lupus, "Primary lupus of the nasal mucous membrane and of the conjunctiva." "Die krankhaften Geschwülste," vol. ii, p. 482.

Treatment.—Topical applications, though of great value in promoting the comfort of the patient and accelerating the cure of the disease, are not to be relied on alone. Nevertheless, the cleansing of the nostrils with some antiseptic solution, either a weak solution of Condy's fluid, or a weak carbolic acid solution, or a solution of chloride of aluminum, or iodine in vapour or as an injection, are very important aids to the constitutional remedies. Residence in a warm climate, sea air and sea-bathing, and the administration of cod liver oil, iron, arsenic, and quinine, in succession or in combination, will be the most important features of the medical treatment. Warm clothing and good diet, with a moderate allowance of wine, are also absolutely necessary, and all exhausting or exciting occupations are to be studiously avoided. Cheerful society and a good deal of out-of-door exercise with early hours, are equally to be insisted on, if by any means attainable.

When there are visible ulcers within the nostrils, which is rarely the case, they should be touched with a strong solution of nitrate of silver (grs. x or xx to f. ℥i), or with a finely pointed stick of the nitrate of silver and nitrate of potash moulded together; and, if the edges of the ulcer are spreading, the strong caustic, or potassa fusa should be applied freely and firmly to those parts of the ulcer which are evidently extending. They should be anointed frequently with a dilute mercurial ointment.

If the ulcers be continuous, with a patch of lupus upon the skin, its depth being great, and the edge comparatively indolent in character, it is probably a case in which the actual cautery, either with the galvanic wire or by the ordinary cautery iron will be more speedily effectual than any other caustic.

If, on the other hand, the edge of the ulcer is swollen, red, irritable, and easily bleeds when touched, it is a case in which caustics are not admissible, and a soothing plan with antiseptic douches and mild ointment, such as ung. zinci, will be more suitable to the case. At the same time, in this irritable form of lupus, the part should be protected from the irritation of cold and the external air by being covered up with cotton wool and

occasional poultices, whenever they can be used without obstructing the nostrils, with or without some antiseptic.

After the ulcers have healed, there is often a sense of rawness and tenderness of the nostrils, depending upon chronic inflammation, and it is useful to employ mild astringent lotions for some time after the ulcerative action has ceased, and as Mr. Durham suggests, in his admirable essay in Mr. Holmes's "System of Surgery," to plug the nostrils with loose dossils of lint, so as to obviate the irritation from the passage of cold air. Glycerine of tannin is a very useful application under these circumstances.

Subsection 4.

The *eczematous* form of nasal ulcers is seen most frequently in young children who have the eczematous eruption on the upper lip and cheeks, and very often chronic blepharitis and tinea tarsi, and not unfrequently follows the exanthemata, especially measles. But it is occasionally seen in older persons of an eczematous diathesis. The odour from the nostrils is seldom very pronounced in these cases. In children the usual faults of feeding, such as over-indulgence in pastry and unwholesome sweets, are generally the chief sources of disturbance, and there are often ascarides irritating the lower bowel. The bowels must be cleared out and then steel and bitters given, with a simple, nourishing diet, and plenty of fresh vegetables.

The nostrils require to be cleansed with the saline warm douche or syringe night and morning, and the zinc ointment applied constantly.

If the crusts collect in such a mass that it is impossible to apply the ointment effectually to the underlying mucous membrane, it will be useful to employ first the glycerine of borax by means of a camel's hair pencil, and then when the crusts have been removed after softening, the nitrate of silver solution (gr. ii to f. ℥i) and the zinc ointment can be used with effect. In adults there are often serious faults of digestion and assimilation to be contended with. It is generally necessary to restrict

the diet to plain joints and vegetables, and to forbid sweets and rich dishes of all kinds. The local treatment is of the same kind as for children, and the following mixture will be useful :—

Magnes. sulphatis ʒiv.
Acid sulph. dil. ʒ ss.
Ferri. sulphatis, gr. viii.
Sp. Chlorof. ♏. xv.
Aq. Pimentæ ad ℥viii.
One-eighth part to be taken thrice daily.

In each individual, however, there will be some peculiarity of temperament, which will have to be met by its appropriate method of treatment. In the majority there is a tendency to deposits of lithates in the urine, and a disinclination to take healthful exercise, with drowsiness after dinner, and an habitually torpid condition of mind and body.

Subsection 5.

The *fevers* which give rise to ulcers in the nostrils, with more or less implication of the bones and cartilage, are measles, scarlatina, small-pox, and typhus. The symptoms may commence by the usual swelling pain and tenderness, followed by ulceration and purulent discharge. They must be treated on the principles already indicated, and with a supporting regimen.

Occasionally after severe *catarrh*, simple ulcers near the orifices of the nostrils occasion great irritation, and require the local application of some stimulant, such as a solution of nitrate of silver (gr. v to fl. oz. i) applied by means of a camel's hair pencil, and followed by the constant use of ung. zinci oxid. The glycerine of tannin is also very useful.

Fissures often form at the orifices of the nostrils either at the anterior junction of the septum with the alæ, or at the posterior angle of the alæ. At the same time the skin around the tip and sides of the nose is swollen and red, and the whole organ is so excessively irritable and painful, that the patient is constantly applying the ends of the fingers to the part, and rubbing

or picking off the scabs as they form, thus increasing the mischief and hindering the healing process. These symptoms are generally accompanied by some gastric or intestinal irritation, and, when children are the subjects, ascarides are often found in great numbers in the stools. Hence, in the treatment, our first indication is to clear out the bowels by a dose or two of some saline aperient, and to follow this up with bitter tonics and steel. The fissures themselves should then be touched lightly once a day with a solution of nitrate of silver (gr. v to f. ℥i), or with the solid stick of sulphate of zinc, and the ointment of yellow oxide of mercury used occasionally. At the same time the hands and fingers must be restrained from picking and irritating the parts by wearing gloves constantly, unless the patient's self-control is sufficient without them. As soon as the redness and irritability have subsided, and healthy granulations have sprung up in the fissures, all stimulating applications must be discontinued, and simple cerate, or ung. zinci oxid. benzoati applied instead. The constitutional treatment should be continued for some time after the fissures have healed, and especial attention to the bowels will be necessary in both cases.

Subsection 6.—*Glanders.*

In 1821, Dr. Schilling, of Berlin, made the first positive observation of a case of glanders in the human subject, but Dr. Elliotson seems to have been the first to call attention in this country to the fact that this disease is communicable by inoculation from the horse to man, and again from man to the horse and the ass. In an elaborate paper in the *Medico-Chirurgical Transactions* for 1830–31, he gives particulars of the cases that had occurred under his own observation at St. Thomas' Hospital, and of seven other cases collected from various sources. Previously to this, Mr. Benjamin Travers had recorded two instances of purulent infection derived from glandered animals; but, although in each case glanders was actually induced by inoculation from the human patients to asses, he regarded the

cases as examples of mere "irritation," such as arises from poisonous wounds in common dissection, and not as a specific disease. Mr. Travers remarks that "the intervention of an animal of a different species, preserving the contagious quality in its morbid secretion, yet insusceptible of the specific disease, is truly extraordinary."

"It would be so, unquestionably," says Dr. Elliotson, "if the fact; but to suppose a disease, produced by the matter of a disease of another system, and engendering matter again producing the original disease in a third system, not to be identical with the original disease, is to me impossible." And certainly the facts adduced by Dr. Elliotson bear out the view thus expressed by him.

Pathologically considered, glanders comes under the granulomatous class of disorders, such as syphilis, lupus, and elephantiasis;—resembling syphilis more closely than the others of the same class, in being communicable by contagion and inoculation, but having some similarity to the others in its structural peculiarities, and its apparently spontaneous origin, apart from contagion, under certain circumstances. To syphilis it has very close resemblances, and it has even been suggested that it may be the same disease; but this view is entirely without foundation. (See Virchow on "Tumours," vol. ii, pp. 543–4.)

The granulations or deposits are, according to Virchow, "neoplastic productions resulting from the proliferation of pre-existing tissues; but there may be occasionally simple inflammatory forms and also exudations. In this respect glanders resembles syphilis. One cannot help recognising the contagious element as an *acid* or *irritant* substance, which may act through the blood or in a direct manner."

The characteristic nodules in the mucous membrane contain granulation tissue, passing into the ordinary products of inflammation, viz., pus, and ultimately yellow cheesy matter from fatty degeneration, so that on section they have a whitish-yellow colour, and a dense cheesy structure resembling ordinary tubercle. The ulcers resulting from the suppuration and burst-

ing of these nodosities sometimes spread in a serpiginous form, healing on one side, and become infiltrated by new deposit on the spreading edge. The cartilages and bones become ulcerated and carious if the ulcers have existed long enough to lead to their complete exposure. (See Plate II, figs. 4 and 5.)

Similar deposits occur in the lymphatics, in the muscles, and ultimately in the internal organs; but the most characteristic point in the pathological diagnosis of a given case is the presence of the nodules in the mucous membrane of the nasal fossæ and frontal sinuses.

*Symptoms of Glanders in the Horse, Ass, and Mule.**

"*Chronic Glanders* is the form most commonly affecting the horse. It is propagated by contagion and infection (?). It never occurs as a termination of acute glanders.

"*Semeiology.* The general health is little if at all affected. There is swelling and hardening of the submaxillary lymphatic glands. A discharge occurs from one or both nostrils, generally from one only (usually the left), which is at first of watery consistence, becoming more gluey, purulent, sanious, and fœtid. Elevations and ulcerations occur on the Schneiderian mucous membrane. *A horse thus affected often appears to be in perfect health.* When placed under unfavourable circumstances, especially if fed scantily, symptoms of acute glanders rapidly make their appearance, and death then soon inevitably follows.

* * * * * * *

"*Acute glanders* occurs more rarely in the horse than the chronic form. In the ass and mule it is the common form of the disease.

"The disease sets in *suddenly*, a short time (a few days) after exposure to contagion, with *symptoms of inflammatory fever*, The respirations are hurried. A copious, yellow, purulent or sanious discharge flows from the nostrils. There is watering of the eyes. Sometimes an eruption of small cutaneous or subcutaneous tumours occurs. Then supervenes violent inflamma-

* Dr. and Mr. Gamgee's treatise in Reynolds's "System of Medicine."

tion of the pituitary membrane, which becomes deeply and extensively ulcerated. Cough and shortness of breathing occur. Death invariably follows.

* * * * * * *

"*Chronic Farcy* usually commences by an indolent inflammation of the lymphatic vessels and glands, which become red, tender, and acquire a large size; the swellings occurring chiefly in the situation of the valves of the lymphatics (farcy-buds). An eruption of small subcutaneous and cutaneous tumours occurs. The large glands and cutaneous swellings have a tendency to suppurate, and indolent ulcers result from the opening of the abscesses; *these secrete an ichorous discharge, capable of producing farcy, or glanders, or both.* The general health may continue good for a long period of time, the disease remaining stationary. If the animal be not destroyed, symptoms of constitutional disturbance supervene. The animal loses flesh, has a staring coat, coughs, and usually falls a victim to acute or chronic glanders.

"*Acute farcy* is distinguised from chronic farcy by the rapidity of its course, the urgency of the constitutional symptoms, and by its being almost invariably associated with acute or chronic glanders. The chief anatomical difference between the two forms is the occurrence, in the acute, of truly cutaneous abscesses or boils. Acute farcy is invariably fatal."

The following conclusions are arrived at in reference to these four varieties of glanders by veterinarians :—

1st. The virus of glanders is specific. It is readily absorbed by a wounded or abraded surface, and is probably absorbed by the unbroken mucous membrane.

2nd. The nasal mucus or the discharge from an ulcer in farcy, or even the blood of a glandered animal, when introduced by inoculation into the circulation of a healthy animal, will induce the disease in that animal.

3rd. The virus of glanders and farcy is identical.

"*Acute glanders* occurs in *man* more frequently than the other varieties, and presents in him characters resembling those

in the horse, in which acute glanders and farcy are combined. The period of incubation of acute glanders varies probably from twenty-four hours to a fortnight; its limits in the majority of cases being from three to eight days."

The human subject is probably not liable to the disease unless a wound or abraded surface is actually inoculated with pus from an ulcer or abscess, or with nasal discharge of a glandered animal; but as there is some difference of opinion as to the possibility of the absorption of the virus by the *unbroken* mucous membrane in animals, it is not certain that the latter mode of infection may not be possible in the human subject. A few cases have occurred in which it has been impossible to find any abrasion or wound of the surface through which the individual has become inoculated with the disease; and hence some have concluded that it may be communicated by the air through the mouth or respiratory tracts; but it is obvious that a very slight abrasion, sufficient to allow of perfect inoculation, might very easily escape notice, especially if, as has often happened, the nature of the disease has been unsuspected at first, and no search for an abraded surface has been made till a late period of the case. One fact in the above quotations from Messrs. Gamgee is very important in reference to this question, viz., that the animal from whom the poison may have been taken may have the appearance of perfect health, supposing it to be suffering from chronic glanders, that being the form of the disease most common in horses; so that in any case, however severe, in the human subject, the real nature of the disease may not be suspected until chance brings to light the circumstance of the patient having been in contact with a glandered animal, or until the peculiar, almost characteristic, discharge from the nostrils arouses the suspicions of the medical attendant as to the possible source of the poison.

Symptoms.—The symptoms commence in many cases by pains, often described as rheumatic, in some part of the trunk, back, or limbs, with dyspnœa and tightness of the chest, with rigors, headache, feeling of lassitude, frequency of pulse, and

often by vomiting and diarrhœa and great irritability of stomach and depression of spirits, the form of fever assuming a typhoid character of extreme violence.

About this time, or from the first onset of the disease, a pimple or wound, before unnoticed, becomes hot, painful, swollen and suppurating, and the parts around become swollen and red. If the pimple happen to be on the face, the eyelids, nose, and cheek become puffed up to such an extent that the eyes cannot be opened. (See Plate II, figs. 2 and 3.) The eye-lids may then become red, hot, dry and shining, and the nose dark coloured and perhaps gangrenous. (See Plate V, fig. 2.) Soon *from the nostrils flows a thick discharge of a deep yellow colour, here and there a little bloody,* and in several cases it has been noticed that the discharge was much more copious from one than from the other nostril. Hard phlyzacious pustules appear on and around the nose, and on various parts of the trunk and extremities. The temperature and pulse are high, the tongue white and dry, the respiration quick and difficult. Then come delirium, and in the course of a few hours swellings of a red colour upon the legs and more pustules about the face, the original pustules having by this time assumed a purple tint. Diarrhœa and profuse sweating, and restlessness with increased delirium, are soon followed by exhaustion and death.* After death purulent deposits are found in the site of the swellings on the limbs and trunk, or in the viscera, and perhaps pneumonia, with suppuration in the pleura. On examining the nostrils an

* In the case of which the plate is an illustration, the patient had been inoculated in the hand, and the dark slough on the forehead is due to the application of leeches in that region. (See Plate II, fig. 1.)

The case is recorded by Dr. Elliotson in the *Med.-Chir. Trans.* vol. xviii, p. 201, et seq., and illustrates the difficulty of diagnosis in those cases in which the first symptoms noticeable are those of gangrenous erysipelas and sometimes mortification. This form of the disease is especially seen in the parts adjacent to the nose and eye.

M. De Graefe has published a case in which the disease assumed the form of an acute exophthalmia, and it was only after death that Virchow discovered the true nature of the malady; he found *glanderous nodosities in the choroid.*—Virchow, vol. ii, p. 553, op. cit.

ulcer or ulcers are found resembling those seen in glandered horses, and in some cases the bones of the nose are necrosed and the soft parts gangrenous.* In one case (recorded by Mr. Brown, surgeon of the 2nd Regiment of Dragoons) the following appearances were noted:—"*A cluster of tubercles* was found in the cellular membrane, exterior to the pericranium of the left superciliary ridge, and in the right frontal sinus, exactly (according to the veterinary surgeon of the regiment) similar to those observed in the frontal and other sinuses of the horse after acute glanders." On dividing the various livid tumours of the surface down to the bone, "the muscles appeared perfectly decomposed and of a dark liver colour, exhaling a peculiar fœtid odour, with points of purulent matter, as it were, infiltrated everywhere through their entire substance, resembling much a hepatized or tuberculated lung," and under each "was a cluster of the grey circular tubercles, the whole composed of fine cellular tissue, enclosed in small cysts, proportionate in size and consistency to the extent and duration of the tumour, and firmly attached to the periosteum." In another case, "the various tumefactions were full of pus, underneath which, in many, a *number of small white granules* were seen; and these, in several instances, were closely attached to the periosteum or perichondrium. The frontal sinuses contained a jelly-like secretion and a number of similar granules."

It will at once strike the pathologist that this disease, in its advanced stages, bears a close resemblance to pyæmia or acute tuberculosis, in some of its symptoms and pathological phenomena, with the addition of the peculiar affection of the nostrils and the specific form of ulcer there found.

The disease is of course of rare occurrence, and is therefore chiefly interesting to the practitioner in reference to *diagnosis*. The chief characteristics are the inflamed pustule on the skin in the early stage, and the copious yellow, sometimes viscid, discharge from one or both nostrils. The pustule or ulcer alone, apart from any specific history, is not sufficiently characteristic

* See Plate II, fig. 4 and fig. 5, from preparations in St. Thomas' Hospital.

to justify a diagnosis, but the rapid swelling of all the parts around it, the extension of inflammation along the lymphatics, and the rapid formation of swellings and phlyzacious pustules around the original pustule, would at once arouse the suspicion of a specific poison, and the history would help to elucidate its nature. Carbuncle and malignant pustule would both be suggested by the appearance. The former would, however, be distinguished by its great size, extreme painfulness, and induration; and the latter by its being, for some days at least, a purely local affection and unaccompanied by any constitutional disturbance, whereas glanders more frequently commences with pains in the hypochondrium or chest, or with rheumatic pains in the limbs, and with severe constitutional disturbance before the local mischief has attracted much attention.

When the yellow or sanious and bloody discharge from the nostrils has commenced, it at once leads to a diagnosis of glanders, but this symptom is not unfrequently so inconspicuous as to be entirely overlooked. Virchow mentions that he examined after death a patient who had been more than six months in hospital for refractory ulcers of the extremities, "and I found," he says, "alterations of tissue which could only be referred to glanders or farcy. We were at that time in complete ignorance that a similar affection had been prevalent among horses, both in the town and in the outskirts. But it was discovered, on an inquiry being made with the greatest care, that there had been for a long time a series of glanderous affections raging among horses employed on the towing paths on the banks of the Maine and the Saale in Franconia. This affection had spread into the country. Thus a single autopsy, made with care, was the means by which an extensive epizootic disease was discovered. But this very case, although the ulcers presented the characteristics of glanderous ulcers, had excited so little attention that it was not until *the presence of nodosities* in the *nasal fossæ* and frontal sinuses had been established at the autopsy, that the diagnosis could be determined."

Cancrum oris, or *noma*, might present some features resembling

those of glanders; but this is a disease almost entirely confined to childhood, in which glanders would not be likely to occur, and the absence of any pustules and of the nasal discharge would be sufficient to distinguish it. (See T. Holmes's "Syst. Surg.," vol. i, pp. 639, 641, 644.) As, however, it is not impossible that *erysipelas* with *gangrenous* complications may occur in the adult, it is quite possible to mistake the nature of such a case; and Virchow mentions that in a case of Von Graefe's, with acute exophthalmus, he after death discovered glanderous nodules in the choroid, and thus established the true character of the disease, which had not been suspected during life.

Prognosis.—"Acute glanders and acute farcy, when accompanied by the characteristic eruption, are almost necessarily fatal. One case of acute glanders, and several of acute farcy, have been recorded, in which recovery took place. In farcy unaccompanied by the eruption the prognosis is much more favourable, recovery being the rule and not the exception. Chronic glanders, especially when complicated by farcy, is almost invariably fatal." (Messrs. Gamgee, op. cit., p. 709, vol. i.) In chronic glanders, recovery has occasionally taken place, after a long series of abscesses extending over two or three years.

The *treatment* should be directed first to supporting the strength and eliminating powers of the system by quinine, brandy, and frequent administration of good soup and eggs, milk, &c. Then the nostrils and sores should be washed thoroughly and frequently with carbolic acid lotions. Dr. Elliotson considered a weak solution of creasote extremely valuable as an injection into the nostrils, and mentions the recovery of two patients under this treatment carried on sedulously for a few weeks. It seems doubtful, however, whether these could have been such severe cases as those in which scattered abscesses had already formed, with severe constitutional symptoms resembling those of pyæmia. Dr. Tilbury Fox mentions arsenic and strychnine as medicines recommended upon good authority, and hyposulphites and perchloride of iron have also been spoken favour-

ably of in this disease, of the treatment of which few medical men have had much experience.

Subsection 7.—*Traumatic Ulcers of the Nostrils.*

Ulcers from traumatic causes can only arise from the presence of foreign bodies, or from the irritation left after the removal of a foreign body, or from the corrosive influence of some injected particle or fluid. The most common form of traumatic ulceration is that caused by the lodgment of some foreign body carelessly or wantonly thrust up the nostril. Children are the patients generally brought to us under these circumstances, and the diagnosis is often not by any means so simple as it would appear at first sight.

Diagnosis.—The speculum (Fränkel's) being inserted into the nostril, a stream of warm water is injected by means of the douche syringe, and it is then often possible to discover the foreign body—a glass bead, perhaps, or a pea or bean, or a piece of cork, or button. But the foreign body, is, perhaps, thrust too far up the nostril to be visible by the observer. We must then have recourse to the probe ; and if the surgeon meets with an obstruction in any direction in which he would not expect to meet with it under ordinary circumstances, he concludes that he had to deal with a foreign body. The history of the case will generally confirm his diagnosis ; but it may happen that the friends know nothing of the accident, or of the nature of the substance introduced. They may be only aware that, during some weeks, an offensive discharge has been coming from one of the child's nostrils, and they may therefore look upon the case as one of disease. In all cases of ozæna in children, therefore, it is of the utmost importance to make a thorough examination of the nostrils, after previously cleansing them by the use of the syringe or douche ; and, if ocular inspection fails to elucidate the cause of the mischief, the probe must be employed. Even if a hard substance is met with, it is not absolutely certain that the presence of a foreign body is the offending condition. It may after

all turn out to be a piece of necrosed bone, but the risk of making an error in diagnosis in this respect is not great, for the time that had elapsed before the sufficient exposure of dead bone would be enough to put the surgeon on his guard against such a mistake. Some kinds of foreign bodies—such as cotton, wool, sponge, or rag—would be more difficult to detect than the harder substances above alluded to, and their presence might be unsuspected and undiscoverable by the ordinary means. A soft, but immovable substance, therefore, in an unusual position, would justify the use of a pair of beaked forceps, and if then seized, its nature might be disclosed by its removal. Some amount of the "tactus eruditus" will be required, in order to avoid seizing a piece of sound membrane instead of a piece of stinking rag or sponge; but the patient's expressions of pain will, in general be some safeguard against rashly pulling at healthy structures.

Treatment.—Having discovered a foreign body, the possibility or desirability of its removal next suggests itself. The surgeon will, of course, remove any kind of obstruction that is lying loose and easily removable, but in the case of a tightly-impacted body, with ulceration of the mucous membrane around it, it is obvious that more mischief might result from the efforts at extraction than benefit from its removal.

Under such circumstances, therefore, the best plan would be to advise delay in the removal of the foreign body, but to favour its expulsion by the use of tepid or warm douches, with a small quantity of Condy's fluid in each injection, and to examine the nostrils from day to day, and with a scoop endeavour to extract the offending substance whenever it seemed loose enough to allow of doing so without injuring the mucous membrane. A pair of fenestrated forceps, with blades that will allow of being disengaged one from the other (see fig. 8*a*), will be most useful in extracting foreign bodies from the nostrils. Each blade forms a fenestrated scoop, and may be used by itself or in combination with its companion blade.

The irritant being removed, the ulceration is generally very

speedily cured; cleanliness, and some soothing application, such as zinc ointment, being the only means necessary for expediting the restoration to health.

In some cases, the foreign body can neither be seen nor felt, though no doubt can exist as to its presence; it may then be removed by giving the patient a pinch of snuff, and compressing the unobstructed nostril during the act of sneezing. This may even remove a substance that is within view, but too tightly impacted to allow of the use of instruments. Another plan is, to compress the unobstructed nostril, aud blow through the mouth, thus forcing it out. If the body is far back, it may be washed backwards into the pharynx by the use of the s ringe.

Subsection 8.

Scorbutic Ulcers are extremely uncommon in the mucous membranes of the nose, except as the result of some accidental irritation in the course of scurvy, or when associated with sloughing of the whole or a great part the tissues composing the lips, gums, and portions of the cheek. Dr. Buzzard remarks (see Dr. R. Reynolds's "System of Medicine," vol. i, p. 744) that "In confirmed scurvy the slightest pressure suffices to open the skin and to give rise to an ulcer, whose edges are hard, thick, and shining, and the surface fungoid and bleeding. Its tendency is to increase rapidly in size, and to invade the neighbouring structures. An intolerably offensive odour is emitted from it. * * * The lips and nostrils are occasionally the seat of this ulceration, and the patient then presents a ghastly appearance, much like that of an aggravated case of lupus. The exhaustion attendant upon these spreading ulcers is often fatal."

Subsection 9.

Ulcers in connection with Paresis of the Fifth Pair of Nerves (Neuro-Paralytic Ulcers).—The influence on nutrition associated with the sensory function of the fifth pair of nerves has been

made the frequent subject of experiment, and is often illustrated in clinical observations. It is especially noticed that when one side of the face loses its sensation, that the eyeball of that side is liable to become inflamed, and the cornea to ulcerate. It has not, however, been so frequently noticed that ulcers of the other mucous surfaces are likely to come on. Such is, however, the case, and is due to the same cause, as I conceive. The reflex nutritional irritability of the part is bound up with its sensational activity, and whenever there is any irritant cause the part is unable to call forth its reparative powers, and the result is a slow molecular necrosis.

In a case at present under my care, the lining membrane of the nostrils is excoriated in patches varying from the size of a split pea to that of a sixpence. The ulcers are dry and sluggish, and show no tendency either to healing or to spreading, though, as the result shows, they do actually increase in size from day to day. The skin of the nose, near the margin of the nostrils, is only slightly invaded by the ulcers, and at this part is slightly redder than the surrounding skin. The woman suffers very much from bleeding from this side of the nose, and she is anosmic also on this side. The ulcerations probably extend quite up to the region of olfaction, though it is by no means certain that that region is actually invaded; the anosmia being satisfactorily accounted for by the swelling and occlusion of the nostril, due to the absence of muscular action in the ala. (See Case, No. VI, in Appendix.)

Little can be done in such a case by way of local treatment. It is, however, well to cover the mucous membrane by some soothing ointment, such as the benzoated lard, and protect the parts from exposure to the weather when the atmosphere is cold and damp. The main treatment must, of course, be directed to the restoration of the nerve function, and in the meanwhile the general nutrition should be kept up by generous, but not stimulating diet, and by avoiding exposure to cold.

In the case above alluded to, attention to these points has again and again resulted in healing of the ulcers, while neglect

almost invariably brings a recurrence of the same mischief. These ulcers being painless, they are consequently very little noticed by the patient herself, and hence her neglect of remedies is easily accounted for.

Description of Plate II.

Fig. 1. The advanced stage of glanders. The figure represents the appearance of the face of a patient under the late Dr. Elliotson, in St. Thomas' Hospital. The case is recorded in the *Medico-Chirurgical Transactions,* vol. xviii, p. 201 et seq.

Fig. 2 and Fig. 3 are taken from wax casts in the Anatomical Museum of King's College. They are described as representing different stages of glanders. In fig. 2, there is simply an eruption of vesicles around the mouth, in fig. 3, the vesicles have given place to dry, hard, dark-coloured scabs.

Fig. 4. A preparation, from the Museum of St. Thomas' Hospital, of the septum nasi of a man who had suffered from glanders. The mucous membrane is much thickened ; its surface is rendered irregular by pustules and ulcers, and by deposits of a lymph-like material. "It presents mucous ulcerated spots. Each ulcer is for the most part circular, and about the size of a pin's head. The larger patches of ulceration have probably resulted from the confluence of the smaller ulcers." (See Catalogue.)

Fig. 5. Part of the nose of a man who had suffered from glanders, it presents mucous ulcerated spots, similar to those in Fig. 4. The two specimens, taken from the same subject, are in the Museum of St. Thomas' Hospital.



Fig. 2.



Fig. 3.

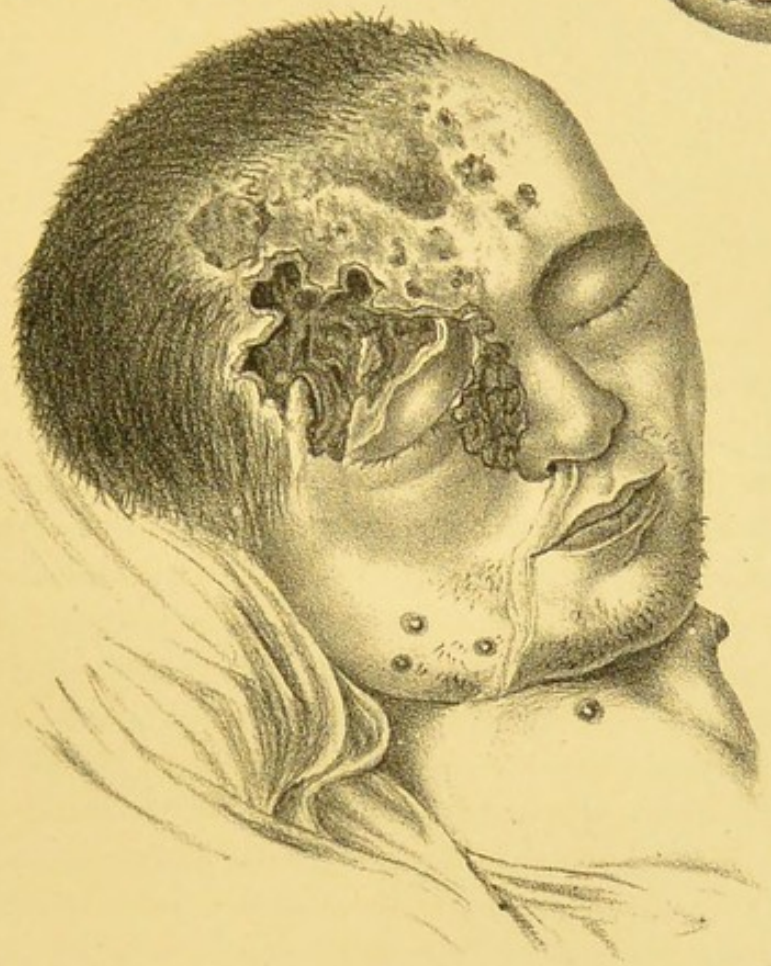


Fig. 1.

Fig. 4.

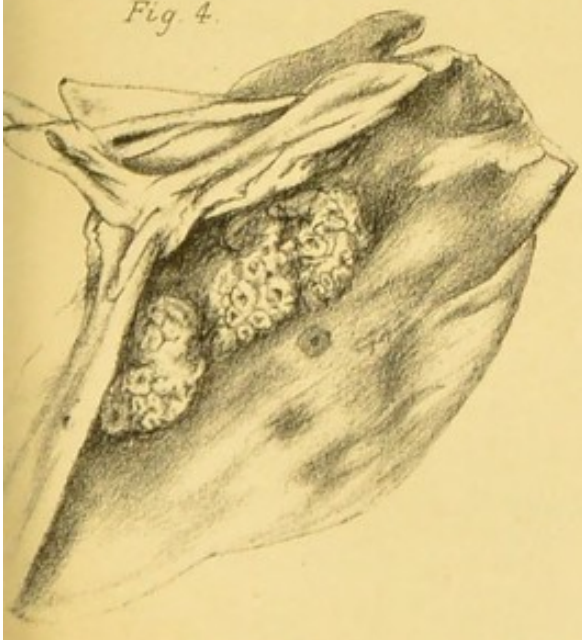
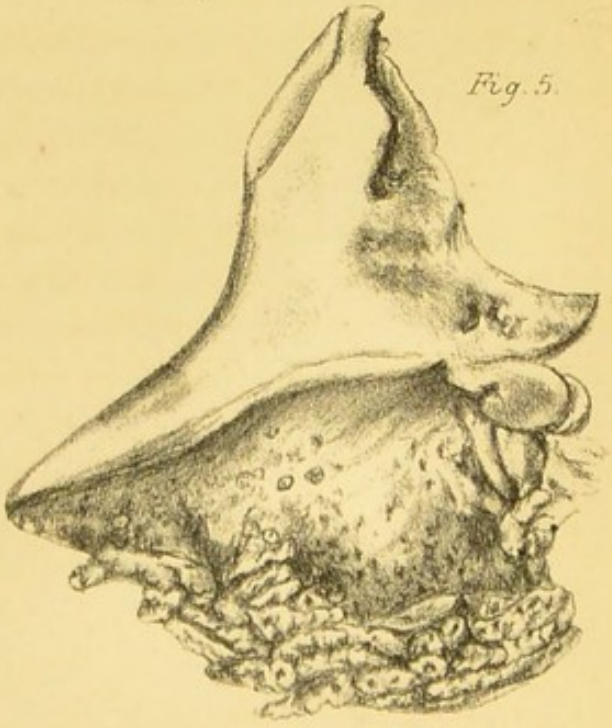


Fig. 5.



W. West & Co. lith.

SECTION IV.

Ulceration of the Bones and Cartilages; Necrosis and Caries; certain Affections of the Septum.

Extension of the various forms of ulcers from the mucous membrane to the periosteum and bone is not a very uncommon result, when the disease has not been arrested by treatment.

The *Erosive Syphilitic Ulcer* sometimes attacks the septum and the other bones and cartilages, rapidly eating into them, and invading in succession all the tissues of the nose and nasal fossæ, and in the worst cases even the surrounding bones, so that the centre of the face is occupied by a hideous chasm. Such extreme cases, however, are fortunately rare, and are only met with among the very poorest and most ill-fed of the lower classes, and even then only in instances of neglect during the early stages of the disease.

The ulcers of *Lupus* and *Rodent Cancers* also attack the bones and cartilages, invading them, however, from the skin surface, eating into the alæ, thence proceeding to the septum and to the more deep-seated parts. Mr. J. Wood's case (Case No. VII in the Appendix) is an instance of the destructive ravages sometimes caused by lupus, and of the great amelioration of the condition of the patient which it is possible for surgical art to afford him. The consideration of this subject is, however, reserved to a later section.

Scorbutic Ulcers and *Glanderous Ulcers* are more rare causes of caries and necrosis of the bones and cartilages in this region.

The *Erosive Syphilitic Ulcer* in the soft parts has been already described, but it assumes a somewhat different aspect

when it invades the bones. Its edges then become dark-grey or black, and sometimes undermined, and the surface has a granular appearance, a very foul greyish discharge covering them and emitting a very offensive odour. The margins are no longer crescentic and comparatively regular in outline, but ragged and uneven, following rather the course and shape of the surface or bone invaded than having any determinate and peculiar form.

If the bone involved is high up in the nostrils the ozæna becomes more offensive and the discharge more abundant, but it may be impossible to ascertain the position or extent of the mischief. On the other hand, if the septum be the part first attacked, as is very often the case, the character of the ulcer will be well seen, and the rate of progress can be more readily watched. It may be found in some of the worst cases that the septum has been perforated, and a great portion of it destroyed in a few days, or there may be a rapid sinking in of the bridge of the nose from absorption or molecular necrosis of the upper bony portion of the septum. In such cases, in addition to the other miseries, the sense of smell is lost, but, as will be seen, not always irrevocably.

It is of the greatest importance to recognize this rapidly-spreading form of ulcer at an early stage, as irreparable mischief is often done in a very few days. The appearance of the sore, if it be within view, is not absolutely characteristic, but its dull grey slaty colour, its granulated surface, its ragged uneven edges, and its rapid increase in depth and area are scarcely mistakeable. There is a total absence of any thing like healthy granulation, and the probe comes upon bare bone in some portion of the ulcerated surface. The patients do not complain of great pain, unless there are, besides the ulcers, patches of subacute periostitis, with subsequent abscesses. There are then severe frontal pains and headache, and the root of the nose or the septum or bridge are exquisitely tender when touched. At the same time, some amount of general febrile heat and great restlessness are often present, especially during the formation of

any abscesses, and the general aspect of the patient is soon very much altered. He becomes debilitated, emaciated, and in a state of constant irritation; the countenance is pale and care-worn; the pulse small, weak, and rapid.

Occasionally severe head symptoms arise from the absorption of the fœtid discharges of the upper part of the nares, and the production of thrombosis of the intracranial veins and acute meningitis. (See Dr. H. Weber's treatise, with cases, in "Medico-Chirurgical Transactions," vol. xliii, entitled "Cases of Cerebral Affection caused by Disease in the region of the Nose and Eyes.") It is probable that in some of these cases the separation of portions of carious or necrosed bone from the base of the cranium near the cribriform plate of the ethmoid has set up meningitis by the extension of the inflammatory action directly to the dura mater. It is, however, an undoubted fact that in some of these cases meningitis supervenes and is sometimes fatal. (See Case L in the Appendix.)

In other instances, the cerebral symptoms seem to depend upon the retention of fœtid discharges in contact with the ulcerated surface, in consequence of blocking up of the nostrils, or some part of them, with dried crusts of mucus, or in consequence of swelling and congestion of the mucous membrane, so that the free escape of the discharge was impossible. In such cases, the re-establishment of the discharge effected by the use of the douche and leeches applied externally has been followed by subsidence of all the cerebral disturbances and recovery of the patient. The special danger of not ensuring a free escape for the fœtid pus, mucus and blood in these cases, is the circumstance that we have here the open mouths of veins in the ulcerated bones ready to take up the poison and carry it into the freely communicating veins of the base of the skull, and thus set up purulent meningitis, and perhaps general blood poisoning.

Treatment.—Much may be done, in the early stages, by the employment of the remedies indicated in Section III for ulcers of the mucous membrane. Those chiefly to be relied on are the

free use of the douche, the mercurial vapour bath*, or full doses of iodide of potassium with sarsaparilla, and the judicious use of caustics.

If, however, the ulcer is rapidly spreading, and the bones becoming rapidly involved, the treatment must be carried on more energetically, and especially with regard to the application of caustics. The acid pernitrate of mercury (the liq. hydrarg. nitratis acidus of the pharmacopœia) or sulphurous acid, or chloride of zinc, must be applied to the whole surface and edges of the ulcer. This is a very painful process, and it is well if necessary to place the patient under the influence of an anæsthetic, in order that it may be thoroughly done, and to give opiates freely in the intervals. It is important, however, that the caustics should only be applied to the diseased surface, and hence some care must be taken as to the method of using them, and especial care is necessary in the use of the fluid caustics, *e.g.*, the pernitrate of mercury or strong nitric acid, or sulphurous acid. The best and safest caustic-holder for these corrosive liquids, is a stick made of deal of about 5 or 6 inches long, with one end cut to a point. This soft wood is sufficiently loose in texture to take up a drop of the acid, and to hold it without risk of any excess running upon the surrounding healthy parts.

It is obvious, however, that no precision in the application of caustics is possible in those cases in which the ulcer is beyond view, and hence, perhaps, one of the great difficulties in the treatment of this terrible malady in the early stage, and hence, too, the rapid downward passage of so many cases to a later and more severe stage.

I wish it, therefore, to be understood that I only employ these violent corrosive acids (1) to ulcers within view of the

* The best form of vapour bath apparatus is that made for Mr. Henry Lee by Messrs. Savigny and Co. of St. James's Street.

In employing *the calomel* for the vapour bath, it is important to use the *doubly-sublimed calomel*, which can now be obtained at most of the London chemists. It is more easily volatilized, and does not irritate the nostrils. The ordinary calomel of the pharmacopœia gives off some irritating fumes of hydrochloric acid, which render it unsuitable for use in the cases under consideration.

anterior nares, as for instance on the septum, and (2) to deep-seated ulcers which have become exposed and accessible, in consequence of extensive destruction of the more superficial parts. If a solid form of caustic be preferred, the potassa c. calce, moulded in sticks, is the most convenient.

There are two objects attainable by the use of caustics in syphilitic spreading ulcers. 1st, the increase of these ulcers has been shown by Mr. Henry Lee to depend upon a kind of successive inoculation of the tissues by the discharges from the ulcer itself, and each inoculation is followed by exactly the same action in the part inoculated as that going on in the ulcer. A slow molecular necrosis, and a constant reproduction of the inoculable virus is thus perpetually going on. Now the application of a strong caustic destroys this virus and leaves a healthy granulating surface. 2ndly, the caustic shuts up the exposed vascular channels in the bones by substituting for the unhealthy ulceration a plastic inflammatory action, and thus the poison is prevented from entering the circulation. In the intervals, and before each application, irrigation with the spray-producer with dilute carbolic acid lotion (1 part in 60) will be very useful as a means of deodorising and cleansing the parts. Mercurials are very rarely required in these cases, but, if used at all, the calomel vapour bath will be of most use, and by its means the calomel can be carried into the nasal fossæ themselves. Douching with the permanganate of potash, or with carbolic acid lotion, is more imperative than ever. Pieces of bone should be removed as soon as they are loose, and abscesses opened as they form.

In most of these cases, large doses of iodide of potassium are very well borne, and when so, the medicine has a very beneficial influence, and must be given in doses of 20, 30, or even 40 grains. Sarsaparilla in full doses may be combined with the iodide, in the form of decoction and liquid extract. At the same time iodide of iron and quinine, and cod liver oil, can be given with great benefit. If there are any concurrent attacks of subacute periostitis of the bones around, leeches may be

applied on the bridge of the nose, and hot fomentations and poultices used. The earliest indication of abscess must be the signal for a free incision of the tissues covering the bone; even if pus has not formed, great relief will be afforded by the incision, and tension of the inflamed tissues will be taken off; there will be less likelihood of necrosis following.

Opiates are sometimes of great service, and should be given in small frequently-repeated doses.

Whenever the circulation is languid, and the constitution of an irritable type, with restlessness and disturbed nights, the use of opium seems to have almost a specific influence over the ulcerating process, as well as over the general health of the patient.

Necrosis of the bony walls, or of the deeper-seated bones in the fossæ, is liable to occur under a variety of circumstances. Severe injuries, leading to abscesses, with detachment of the periosteum, not unfrequently leave the bones in a necrosed condition. The abscess, after it has been opened, or has discharged itself spontaneously, remains open as a sinus, and, on probing this sinus, portions of denuded bone are discovered. In the course of time—sometimes weeks, or even months after the injury, the bare bone is found to be lying loose in the cavity of the abscess, and either comes away in the discharge or is removed by the forceps.

Abscesses following the exanthemata and erysipelas, are often associated with necrosis of some of the more superficial bones. The same thing occurs occasionally as a result of lachrymal abscess, especially if the opening of the abscess has been long delayed, and if the patient has a scrofulous constitution. These abscesses are very liable to come on after the different fevers, especially measles and scarlatina in children of a weakly habit or badly nourished. In all these cases it is important to open the abscesses as soon as it is clear that there is a collection of matter, but it is better to avoid probing them until all acute inflammatory redness and swelling have subsided. The tension of the parts being taken off by the free opening and discharge, no probe should be passed for at least a fortnight, and when it

is used, it must be done rather with a view to ascertain the condition of the parts than for the purpose of establishing the passage through the nasal duct. If bare bone be felt, all probing must be rigidly abstained from, until there is reason to believe that the sequestrum is separated and can be easily removed without risk of damage to the neighbouring parts. Meanwhile the parts should be poulticed, some antiseptic, such as a weak solution of carbolic acid, or chloride of aluminium, or zinc being used as an injection and lotion each time the poultices are changed. The general health must at the same time be kept up by good diet, and cod liver oil, and steel in some easily-assimilated form, given as medicines. There will seldom be any difficulty in removing the bone when the time has arrived for operating, and I have generally found that it has no tendency to become locked up by the formation of new bone around it, as so often happens in the case of necrosis of the bones of the limbs. Hence, in this region, delay in operating is not to be dreaded as likely to increase the difficulties, but rather to be encouraged as likely to facilitate operative interference.

In most cases of long standing syphilitic ozæna, and in many of idiopathic ozæna, in which treatment, perseveringly and steadily carried out has failed to remove the offensiveness of the discharge, there is reason to believe that some dead portion of bone is locked up in the intricate mazes of the ethmoidal cells, or in one or other of the sinuses communicating with the nasal fossæ. The necrosis in these cases will have arisen either from the isolation of a fragment by ulceration having extended in various directions around it or from the original severity of an acute inflammatory attack.

The *diagnosis* is uncertain and difficult in all cases, unless the part affected happen to be within view by rhinoscopic examination or within reach of the probe. Some indication of the nature of the case may be afforded by the occasional escape of small fragments of sequestrum in the discharge, but no reliance can be placed upon the reports of patients on this head, and it is often impossible to gain any clue to the actual condition of the more

deep-seated bones. The free use of the douche is of course a great aid in making a rhinoscopic examination, and its immediate effect will be some aid in diagnosis. If, after a free use of the douche the stench from the nostrils disappears, it is a strong evidence not only that no necrosed bone is present, but it also makes it nearly certain that there is no actual caries of the bone. In such a case the stench is probably due to the decomposition of the retained crusts of discharge. If, on the other hand, the stench remains after a thorough douching, or very quickly returns, there is probably necrosis, and almost certainly ulceration or caries. Having, under these circumstances, exhausted all the remedies employed for this distressing and disgusting malady, it is rational to suggest to the patient that some attempt should be made to reach the *fons et origo mali,* which we have every reason to suppose is a portion of diseased or dead bone.

How then to reach the disease is the next question.

The hitherto insurmountable obstacle to reaching the offending sequestrum has been the small space offered for manipulation and examination by the limited aperture of the anterior nares. This difficulty might no doubt be overcome by slitting up the nostrils along the line of junction of the alæ with the cheek, or by dividing the middle line of the nose and reflecting back the alæ, one or both, to the sides ; but these are formidable proceedings, inasmuch as there is an inevitable scar left after either of them.

Hence it has been proposed by Dr. Rouge, of Lausanne (in a work entitled " Nouvelle Methode Chirurgicale pour le Traitement de l'Ozêne "), to accomplish the same object by lifting the upper lip and nostrils together, having first freed them by incisions through the mucous membrane of the mouth and divided the cartilages at their attachment to the upper jaws. The anterior bony nares are thus completely exposed, and a very good view is obtained of the interior of the nasal fossæ, with a large space for the introduction of instruments.

Mr. Warrington Haward informs me, that he has succeeded in one case in removing a piece of dead bone from the nasal

fossæ by this method of operating, and that the lady operated on was free for six or seven months afterwards from the offensive ozæna with which she had been troubled, and was highly delighted with the result. The bleeding in this case was very free, but was easily controlled, and the parts came very well together afterwards, leaving no deformity whatever.

Great assistance was afforded during the performance of the operation by the use of blunt hook retractors, by means of which the upper lip, and the whole of the upper part of the face with it, was drawn up out of the way of the operator.

Dr. Rouge, of Lausanne, has operated in this way for a number of similar cases and with very satisfactory results, but out of eight cases recorded by him, one patient died of pyæmic infection and meningitis due to the operation. This accident might, of course, occur after the most trivial operation, and in no way derogates from the merits of the proceeding, which was in all the other cases eminently successful. (See Case XLIX in the Appendix.)

It is, perhaps, hardly necessary to observe that in any such operation on the bones high up in the nasal fossæ, the surgeon will have to proceed with very great caution, on account of the very close proximity of the diseased parts to the cranial cavity and the very thin delicate texture of the bones chiefly involved. The cribriform plate of the ethmoid, even if not actually diseased, might be very easily torn away or broken, if a portion of the superior turbinated bones were roughly pulled at by means of forceps or other instruments. It is almost certain that meningitis would be set up by any such rough handling as this.

The *septum* is liable to various accidents of the diseases described in Section III, and more especially to ulceration of syphilitic origin. Whenever the bones of the nose are attacked in the course of syphilitic ozæna, some portion of the septum is generally involved in this mischief. Ulceration of this part is very difficult to arrest; necrosis of the exposed bone very often follows, and perforation of the septum is not an unfrequent result. The ulcers, if spreading rapidly, should be

touched on their growing edges with strong solution of nitrate of silver, or with the acid pernitrate of mercury, and an ointment of dilute nitrate of mercury, or the grey oxide, kept applied in the intervals. Douching with a weak solution of permanganate of potash must be kept up several times daily, and constitutional treatment will of course have to be rigidly attended to. Calomel vapour for inhalation is very useful in these cases.

Lupoid ulcers within the nose, and true lupus from without, are equally liable to invade the septum nasi. They must be treated in accordance with the principles to be hereafter laid down (Section VIII). The ulcers resulting from glanders are very characteristic (see plate). Simple abscesses may form under the mucous membrane covering the septum; blood tumours, the result of contusions, may also occur on one or both sides of the bone or cartilage, or both. In the case of abscesses, the sooner the pus is let out the better, as there is less chance of the periosteum or perichondrium being stripped off by the progress of the purulent effusion. But in the case of blood tumour, it is better to leave the blood in its position, unless from the great bulk of the effused blood the respiration is impeded. It may not be easy to distinguish between these two conditions, but the precedent injury and the comparatively sudden appearance of the swelling will be some guide to the diagnosis, and the heat and redness, which would be present in the case of abscess, would be absent in the case of injury. In the former fluctuation is easily made out, in the latter it is scarcely appreciable, unless the amount of blood effused is very considerable.

In a paper on "Blood Tumours and Abscesses of the Septum," in the *Dublin Journal of Medical Sciences*, vol. iv, pp. 16–28, Mr. Fleming gives us the following results of his experience in these somewhat rare affections:—

Bloody tumours of the septum are always the result of injury. They resemble ecchymosis in other parts of the body; they may occupy one or both sides, being sometimes flattened, sometimes prominent and much distended. They feel resistent,

and the presence of fluid is not always distinguishable. Their colour is of a dark purple, and they present a smooth and glossy appearance; they have a broad base and abrupt margin. The symptoms complained of are a general fulness and stuffing of the nares, proportioned to the extent of the effusion. (See Case VIII in Appendix.)

As a rule, the interference of the surgeon is not called for. Cooling applications are generally sufficient, but in extreme cases there may be so much discomfort from the obstruction caused to breathing, and from the great tension of the parts, that an opening must be made for the relief of the patient's immediate sufferings. Mr. Fleming has observed the condition in a slight form in many cases in which no complaint has been made by the patient. Probably fracture of the cartilage is associated with the effusion of blood, as it is otherwise difficult to account for the separation of the mucous membrane from the cartilage, which in a state of health are so intimately united.

Abscesses are occasionally the result of injury, and, perhaps, not unfrequently, the sequels to blood tumours. But they may arise spontaneously in connection with scrofulous disposition, or subsequently to the exanthemata, small pox, measles, or scarlatina. When an abscess forms as a result of injury, there is generally great swelling, redness, and heat of the superficial parts, and they may be very tender to touch and œdematous. Some amount of constitutional fever is also present.

The pain spreads from the nose to the frontal sinuses and lachrymal passages; and there is lachrymation as a consequence. There may be also tumefaction of the upper lip and the contiguous part of the septum.

The appearance of these tumours is remarkable. They are smooth and shining, and of a bright red colour; very tender on pressure, and give a distinct sense of fluctuation. These abscesses should be opened as early as possible, and great care should be taken of the patient afterwards, who should be enjoined to avoid all exposure to cold, and the use of alcohol except in very moderate doses. There is always a risk of necrosis of

the bone and cartilage, and the result is very disastrous as regards the patient's personal appearance. The longer the delay in opening an abscess the greater the risk of the periosteum or perichondrium being stripped off and of necrosis ensuing. (See Case, No. IX in Appendix.) Idiopathic or spontaneous abscesses in this region are generally confined to the septum narium itself, and come on much more insidiously than the traumatic cases. When formed they are less red, less tense, and less painful than the last described kind. They may be associated with necrosis or caries of the bones, of scrofulous or syphilitic origin.

The prognosis of abscesses of the septum is almost always favourable; there is, indeed, some risk of necrosis, but that is a remote chance. If opened in time and treated judiciously, the probability is in favour of recovery of the cartilage, or, at any rate, of a mere absorption of some portion of it, due to the slow pressure that has been exerted upon it. If a small opening only remain between the two nares, it will not be of much importance, and it is not likely to interfere with the external symmetry or beauty of the organ. It is only when a large portion of the bony septum is destroyed that we fear a falling in of the bridge of the nose.

SECTION V.

Diseases of the Frontal Sinuses.

Subsection 1. Anatomy and Functions.

„ 2. Injuries.

„ 3. Abscess.

„ 4. Chronic Abscess or Mucocele.

„ 5. Cysts.

„ 6. Polypi.

„ 7. Osteoma.

„ 8. Foreign Bodies.

SECTION V.

The Frontal Sinuses.

Subsection 1.—*Anatomy and Functions.*

The frontal sinuses are the hollows left between the diverging outer and inner tables of the frontal bone, corresponding externally to the superciliary eminences. They vary in size and form in different individuals, being larger in fully-developed adults than in younger subjects, and in men than in women, and being absent altogether in the fœtus. They undergo great enlargement at puberty. In a well-developed skull each half holds about a drachm of fluid, and the cavity extends about $1\frac{1}{4}$ inch outwards along the roof of the orbit on each side of the middle line, and about one inch directly backwards. They are divided generally into two unequal cavities by a median septum. Sometimes one or both halves are also divided into compartments, and there are generally incomplete septa springing across from the walls above or behind. The anterior ethmoidal cells partially close them in below, but they communicate with them and open into the middle meatus of the nose, through the infundibulum.

This cavity, or collection of cavities, is lined with a continuation of the ciliated mucous membrane of the nasal fossæ. It has mucous glands sparingly distributed over it, and its thickness is much less than in other parts of the nasal fossæ; it is also more closely united to the periosteum, and has a paler appearance, as if less vascular than ordinary mucous membrane, wearing the aspect of a serous, rather than of a mucous, membrane.

The *functions* of these sinuses are—

1. To give a combination of lightness and strength to the

bony arch of the forehead. Strength alone might have been sufficiently provided for by a solid beam of bone occupying the position of the sinuses, but this would have materially increased the weight of the skull, and incidentally caused the concussion of the jaws in mastication to be communicated with more direct force to the base of the brain.

2. These sinuses, with the antra Highmoriana, being out of the direct current of inspired air, act as reservoirs of warm moist air, and so provide against accidental drying up of the mucous membrane of the olfactory region, such as might occasionally be induced in sudden changes of temperature, and especially in changes, from an atmosphere charged with warmth and moisture, to a cold and dry condition of the surrounding air. In such changes the constant passage of the air through the nostrils would endanger a drying up of the mucous membrane in the course of the air current; but these cavities in the surrounding bones, being in indirect communication with the main channel, and having the air confined and stagnant, would not be immediately affected by the condition of the air passing through the nostrils. By the law of diffusion of gases, the watery vapour in them, which is in excess of that in the nasal fossæ, becomes gradually mingled with it, until the equilibrium is gradually restored.

3. The prominence of the superciliary eminences gives a marked character to the expression of the countenance, and serves besides as a *point d'appui* to the muscles of the forehead (corrugatores supercilii and occipito-frontales) which have so remarkable a function in expression.

4. The same prominence affords protection to the eyeball against external injury.

Subsection 2.—*Injuries.*

Direct blows upon the forehead, between the eyes, or on the superciliary eminences, may cause a fracture of the bone and drive in the anterior wall of the frontal sinus, without

causing any serious consequences, unless the skin is broken or the bones injured beyond the area of the posterior wall of the sinus. This case offers an exception to the rule of depressed fractures of the skull, and the treatment will be of the simplest kind. The prognosis, however, should be cautions, for the visible injury may not represent the whole extent of the fracture, and the size and shape of these sinuses is so very variable, that it may not be possible to put a definite limit to the extent of the injury to the deeper structures. In the absence of cerebral symptoms, a fracture immediately over the region of the frontal sinuses is nearly always unimportant as regards the ultimate consequences. For a curious instance of emphysema complicating fracture of the wall of the sinus, see Case XI A in the Appendix.

When the fracture is compound it is more serious, as suppuration is very likely to be induced with its attendant dangers; but even when foreign bodies are lodged in the sinus, as in the case of gunshot wounds, very good recoveries are often made. In Mr. Guthrie's "Commentaries on Surgery," pp. 373, 374, two cases are given in illustration of the comparative harmlessness of such injuries (see Cases No. X and No. XI in Appendix), and, a more recent case, under the care of Mr. Geo. Lawson, is a still more striking instance in point (see Case No. XII in Appendix). Surgeon-Major Williamson has also recorded a similar case in his "Notes on the Wounded from the Mutiny in India, 1859" (see Case XIII in Appendix). When the fracture is compound it may be advisable to remove loose fragments of bone, and in order to do this it is sometimes necessary to trephine or cut away with cutting-pliers the overhanging edges of the fractured part, in order to allow room for the introduction of forceps and the extraction of the fragments and foreign bodies. If necessary, the sinus may then be syringed out with a weak solution of Condy's fluid, and a dressing of carbolized oil (1 part in 40) on lint applied over the aperture, which it is rarely desirable to close up at once, suppuration being almost inevitable after such a severe injury (see Case No. XIV, cited

from Baron Larrey in Demarquay's work, in Appendix). When much bone has been removed, and the wound has skinned over, it has sometimes happened that the skin is distended into an elastic crepitating swelling whenever the patient blows his nose (see Guthrie's "Commentaries," p. 374), so that a compress and bandage are necessary for its relief; but these cases are very rare. There are two possible sources of erroneous diagnosis, in cases of compound fracture of the frontal sinuses, which it may be well to mention in this place:—(1) the escape from the wound of a mingled mass of pus, mucus, and blood may lead to the impression that *cerebral* substance has been wounded and is in a state of suppuration. The whitish and opaque flakes of inspissated mucus of the inflamed sinuses have a certain coarse resemblance to cerebral matter, but the absence of cerebral symptoms, or the use of the microscope, will soon clear up any doubt on this point. It is, of course, not impossible that, in very severe injuries in this region, and especially in gunshot injuries, brain substance might escape, and if such is the case, it will then be necessary to probe the wound and ascertain the condition of the posterior wall of the sinus. (2) The integuments and bone may be torn off from the region of the sinus, but the periosteum and mucous membrane may remain entire, and these will be blown outwards and sink inwards with the movements of respiration, thus imitating the pulsations of the dura mater, so that the careless or inexperienced surgeon might suppose that the brain was protruding. Anatomical considerations will, in most cases, prevent our falling into an error of this kind, but, in a complicated injury, the possibility of making such a mistake should be kept in view.*

Very rarely the posterior wall of the sinus is fractured as well as the anterior, and effusion into the cranial cavity may take place, and death may result (see Case No. XV in the Appendix). In the case cited there was a "scarcely perceptible

* "Etiam id à me observatum, quum reficitur hujusloci vulnus, aerem non absque impetu erumpere, eum esse existimantibus imperitis chirurgis quem cerebrum eructat."—P. Paaw, "Osteolog." p. 40.

crack in the posterior wall of the sinus, with severe inflammation of the adjacent portion of the dura mater, and a sanguinolent and serous effusion between that membrane and the anterior right lobe of the brain." But this injury is not necessarily fatal when the dura mater is exposed by fracture of the posterior table. In Mr. Lawson's case, already cited, the pulsations of the brain could be seen in the wound. The patient, however, made a good recovery. A troublesome occasional result of severe injuries, with much loss of bone substance, either at the time of the injury or by subsequent necrosis, is the persistence of a fistulous opening. In order to avoid this, it is well, during the cicatrization of the wound, to bring the edges of the skin together as soon and as closely as possible, and to give any loose portions of skin such support, by strapping and pads, as will prevent their flapping backwards and forwards with the respiratory movements.

An aërial fistula once formed is very difficult to deal with, but it is not impossible, by means of carefully contrived plastic operations, to close the opening effectually.

Subsection 3.—*Abscess of the Frontal Sinuses.*

Injuries, with or without fracture, may give rise to inflammation and suppuration within the frontal sinuses; catarrhal inflammation may extend into them from the nostrils; caries or necrosis may be the cause of suppuration, and yet no true abscess necessarily results, so long as there is a free escape of the purulent discharge from the nares. The symptoms will then be chiefly subjective, the patient complaining of heat, tension, and sense of stuffing in the forehead, and having some general febrile disturbance. But if the communication between the anterior ethmoidal cells and the nostrils becomes cut off by becoming plugged with inspissated mucus or by swelling of the mucous membrane, very serious symptoms often follow. The upper eyelid and the parts adjacent become suddenly swollen, red, and hot, with a sense of fulness, and pain in the forehead.

Rigors follow, and perhaps in a few days delirium, or semicoma, or paralysis of the limbs of the opposite side give the first indication of the course taken by the pus. (See Case No. XVI in the Appendix.) In such a case there is little doubt that an abscess has formed in the frontal sinuses or in the orbit, and has made its way into the cranial cavity through the posterior wall of the sinus or through the optic foramen. The probability is in favour of its having taken the first-mentioned course. If the abscess had been originally in the orbit, it would have pointed anteriorly at the inner angle of the orbit, or would at least have given evidence of its position in the orbitar cavity by some amount of displacement of the eyeball, or even by causing very decided exophthalmus. The prognosis, therefore, in such a case will be of the most unfavourable kind, and treatment will be almost entirely expectant. If, however, there is any indication of the pointing of pus near the inner wall of the orbit, it would be well to make an incision in that direction, and even to trephine the frontal sinus and use injections of warm antiseptic solutions. A case is also related by Richter (*Observat. Chirurg. Fasc.* 2nd) in which a suppuration within the frontal sinus burst into the cavity of the cranium and was fatal.

Fortunately the abscess may point anteriorly, and when it does, it forms a swelling near the inner and upper part of the orbit, generally above the tendo oculi. There is considerable swelling of the upper lid and of the parts over the frontal sinus itself, but the swelling does not extend below the tendo oculi, or at least does not become very marked in that direction. There is also great tenderness over the region of the sinus. Rigors and general febrile disturbance accompany the formation of the abscess. It may burst through the skin of the upper eyelid, or may find its way through the bone anteriorly.

Diagnosis.—The early recognition of the seat of the mischief is of some importance. The localization of the symptoms is not so exact as might be expected, and in very acute cases the aspect is at first sight more like an attack of erysipelas than one of abscess in a particular sinus. It has often, I believe, been

mistaken for erysipelas, though it is not impossible that, in some instances, the one disease may have given rise to the other, and the two may have been going on together for some time after the onset of the attack.

The swelling of the eyelid, and of the parts above the tendo oculi, distinguish the case from one of lachrymal abscess, in which the pain, swelling, and tenderness are more below the same tendon than above it, and in which there is regurgitation of pus or mucus, on making pressure over the sac, and an overflow of tears from the eyelids.

Treatment. Seeing that the abscess is decidedly pointing anteriorly, it may be judicious, if the patient is not suffering much pain, to wait for a few days before opening it. Meanwhile poultices may be kept constantly applied. If, however, the pain is severe, a free incision should be made down to the bone wherever there is any indication of pointing, and the bone opened by means of a small trephine. If there be no evidence of swelling and pointing at one part of the bone more than another, the trephine should be applied as near the upper and inner angle of the orbit as possible, the cavity of the sinus having considerable depth at this point, and the bone wall being not so thick as in front. The possibility of wounding the angular artery at this point, and of dividing the frontal branches of the superior division of the fifth, must not deter us from operating, as a little bleeding is unimportant and may even be beneficial, whereas the continued retention of the contents of the abscess may lead to disastrous consequences. Having made an opening, it should be syringed out thoroughly two or three times a day with some warm, weak solution of Condy's fluid, and after the acute swelling and pain have gone off, a probe should be passed into the cavity, and an attempt made to establish a communication with the nostrils by the natural channel, and, if that cannot be found, an artificial opening should be made by means of a stout steel director, passed as nearly as possible in the line through which the sinus communicates normally with the infundibulum, viz., in a direction downwards, backwards, and outwards. In order

to keep this communication open, a drainage tube should be passed through into the nostril, and the two ends tied together. When once established in this way it may be used as a means of syringing through from above. In some rare cases the abscess makes its way directly into the nostrils (see Case No. XVII in Appendix), and this is the most favourable termination of the case; unless it should happen that the sinus contains some necrosed or carious bone, for under these circumstances an opening will have to be made afterwards for the purpose of extracting it.

The removal of necrosed portions of bone is sometimes required before the abscess will close up. (See two Cases, No. XVIII and No. XIX in Appendix.)

The operation is not unattended with risk, for we may be in doubt on commencing as to the condition of the bone in the posterior wall of the sinus, and, under these circumstances, there might be some danger of tearing or bruising the dura mater in the act of pulling away the sequestrum. In order to avoid this, we must make sure, by careful examination with the probe, that the fragment to be removed is either lying loose in the cavity, or is only attached to its anterior or inner wall, and when pulling with the forceps we must be very careful to avoid tearing away any fibrous adherent membrane.

Ulceration of the frontal sinuses is one of the characteristic lesions in glanders, and the yellow nodosities and ulcers found in their cavities, after death, have been the means of diagnosis in doubtful cases of disease. Hence, in any case of severe puriform discharge from the nostrils, with great prostration, and low typhoid symptoms, we may suspect glanderous infection, and it will be well to institute inquiries as to the possible sources of contagion. In the treatment of this disease, the late Dr. Elliotson spoke very highly of creasote injections, by means of which he believes he cured two cases of glanders. (See Paper in *Medico-Chirurgical Transactions*, vol. xix, on the medicinal action of creasote.) We may, therefore, employ carbolic acid in solution (1 part in 40 or 60), with some prospect of curing the patient.

Abscess in the brain may be associated with ulceration of the frontal sinuses. Dr. Bright has recorded a case in which the lining membrane of both frontal sinuses was extensively ulcerated, and an opening had taken place from the left into the cavity of the cranium. The case was complicated with abscess in the anterior part of the left hemisphere, but the symptoms seem to have been very obscure, being chiefly those of continued fever, during recovery from which there was a discharge of blood and pus from the nose. This was followed by symptoms of cerebral disease, ending in coma. (Abercrombie, op. cit. p. 40.)

Subsection 4.

Chronic Abscess or Mucocele results from the extension of catarrhal congestion to the frontal sinuses from the nasal fossæ, the communication between them being cut off by some accidental cause, such as the plugging of the anterior ethmoidal cells with inspissated mucus or crusts, or the permanent thickening of the mucous membrane at this point, or in the infundibulum, so that the escape of discharges is impossible.

Mucus and pus collect and gradually distend the sinus; the patient has a constant feeling of dull pain and headache, and at length finds that there is a prominence forming between the root of the nose and the eyeball, and that the latter is becoming very much displaced, generally in a direction outwards, forwards, and downwards. When examined by the finger, the expanded walls of the sinus give the impression of a bony tumour, unless it has happened that a portion of the expanded bone has become so thin as to be compressible, or has been entirely absorbed, and so left only the fibrous structures to retain the fluid within.

Diagnosis.—It will therefore be difficult to ascertain by manipulation what is the exact nature of the tumour. An exploratory puncture will at once clear up the matter by causing an escape of a gruelly viscid semifluid, which we at once recognize as inspissated mucus, or if suppuration have already occurred, a flow of pus will make the case still more unmistakeable.

The appearance of the swelling is so like that of a bony tumour that a mistake of diagnosis is very likely to occur. In one case I had an opportunity of observing for some time, there was no appearance of superficial redness whatever, and though there was obscure fluctuation at one part, the bony flakes and nodulated surface, coupled with the slowness of the growth of the swelling, suggested an osteo-sarcoma rather than a mucocele. (See Case No. XX in Appendix.)

In another instance (occurring in a man about twenty-four years of age) there had been a slowly-growing tumour for twelve years, no fluctuation was observable, and the diagnosis was made of an exostosis. In this case also there was complete absence of superficial redness, and the eyeball had become slowly displaced outwards. One circumstance, however, occurred in the progress of this case that made the diagnosis doubtful: this was the fact that there had been, about a month before the operation, a sudden increase in the swelling while the patient was at his work. On making an exploratory incision, the wall of the sinus was opened, and a thick muco-purulent fluid escaped.

Cysts or polypi present appearances and symptoms precisely similar to those of chronic mucocele, and exploratory incisions or punctures are the only means of making a certain diagnosis.

Treatment.—An opening should be made, as soon as the nature of the case is clearly made out, in the most prominent part of the swelling. In the cases I have seen, the wall of the sinus was fibrous, and could therefore be opened by the scalpel, but in the event of an opening being decided upon while the walls remained bony, a trephine of very small diameter (about $\frac{1}{8}$ inch) would be the best form of instrument with which to make the opening.

If the discharge cannot be got away through this small aperture (though it will generally be easy to accomplish this with the aid of a syringe), the opening may be enlarged by means of the bone-cutting pliers, and the interior of the sinus can then be satisfactorily explored by means of the finger. We should not expect to find in these cases any caries or necrosis,

but some accidental stoppage of the communication between the sinus and the nostrils is almost sure to be found, and it will be a guide to the proper method of overcoming this to ascertain its exact seat. If the obstruction is found to be within easy reach of the finger or a probe, it will be sufficient to break this through with a steel director or a trocar, and to pass a probe daily in order to keep it patulous. But if there be an obstruction beyond the floor of the sinus, there is nothing for it but to make a free opening into the nostril by breaking a way with a sharp-pointed trocar (a curved trocar, such as that used for puncturing the bladder per rectum, answers well) through the anterior ethmoidal cells, the direction taken by the instrument being downwards, backwards, and a little outwards. It is then well to pass a small drainage tube, or two or three strands of silk, into the nostril, tying the ends over the alæ nasi, if they can be easily passed through the aperture of the nostril below. Failing this, a piece of stout silver wire, or pure lead wire, may be passed into the newly-made aperture and kept in for a week or ten days, or until there is reason to suppose a permanent passage has been established.

As soon as a free escape of the mucus down the nostrils has begun, it is well to prevent all passage of pus or mucus through the frontal wound, though it will not be prudent to close it entirely until the character of the discharge has improved and it has assumed the appearance of sero-mucus. This may be expedited by the use of weak astringent injections, such as sulphate of zinc, alum, or sulphate of copper.

There is always a difficulty about closing these fistulous openings into mucous cavities, and especially those communicating with the air passages, and hence the importance of not allowing the wound to remain too long open, as the edges are more likely to become mucous in texture, and consequently, less easily healed when it is desired to close the opening.

The displacement of the eyeball may continue for a long time after the emptying of the sinus, but it will become gradually less and less conspicuous as its walls close in.

A case, recorded as one of *Dropsy of the Frontal Sinus,* by Mr. Bellingham, of Dublin, in 1850, seems to be of the same nature as those just alluded to, but was remarkable for containing a dark-coloured fluid, resembling bile. This may have been caused by extravasated blood, in consequence of some injury received either as the starting point of the swelling, or in the course of its development. (See Case No. XXI in Appendix.)

Subsection 5.—*Cysts.*

Several instances of hydatid cysts, and one of steatomatous cyst, have been recorded by various authors. (See Demarquay, "Tumeurs de l'Orbite," pp. 95—97.)

They are distinguishable by presenting a swelling of the superciliary eminences of the upper and inner angle of the orbit, with no soft or fluctuating prominence in the early stage, but at last presenting decided fluctuation, the soft fluctuating prominence being surrounded by a margin of thinned and irregular plates of bone. The eyeball is more or less displaced in one case ("Atlas des Maladies de l'Œil humain d'Ammon.," plate x. partie ii. f. 3), the eye being thrust as low as the end of the nose.

The *diagnosis* in these cases remains obscure until the escape of the contents of the cyst has been effected by nature's unassisted efforts, or by the aid of art.

In a case that occurred to Langenbeck there were some appearances in the distortion resembling those of mucocele of the lachrymal sac, but it was concluded that the lachrymal sac was not involved, because on making pressure over the swelling there was no regurgitation of mucus or other fluid through the canaliculi, and it could not be emptied by pressure. There was no overflow of tears or mucus on to the cheek. (See Case No. XXII in the Appendix.)

Treatment consists in evacuating the contents of the cyst as soon as possible, and exciting contraction of the cyst wall by injections of some stimulating lotion, such as iodine or sulphate of zinc.

Subsection 6.

Polypi of the frontal sinus are very rare. I have only found one specimen of a polypus within the sinuses in the pathological collections of London, viz., in St. Bartholomew's Hospital. In the museum of that hospital (specimen No. 23, 15) there is a section through the nose showing soft polypi suspended from the mucous membrane of the inferior and middle turbinated bones; and one smaller polypus in the frontal sinus. King's College Anatomical Museum possesses a specimen of a polypus hanging *from* the sinus into the nasal fossæ. (See Plate III, fig. 7.)

Seven examples of polypi of all descriptions, including fibrous polypi, are collected by Demarquay, as occurring in this sinus. One recorded by Levret was a remarkable case, in which there were in all seven polypi, in the nose, throat, maxillary and frontal sinuses. The facial distortion was hideous; "the nose spread out to the usual width of the malar bones; a very considerable protuberance of the root of the nose; the eyes very much protruded and separated laterally; epiphora, and two lachrymal fistulæ, &c. * * * On opening the sinuses after death, they were found converted into a single cavity, occupied by two polypi—each attached by a slender pedicle, close to the excretory passages from the sinuses. The lining membrane of these sinuses was thickened." (See Case No. XXIII in the Appendix.)

In such a case as the above it would seem hopeless to attempt any operation for the relief of the patient, the diseased parts occupying so large a portion of the face, and their extent towards the deep parts being so difficult to ascertain.

A case of supposed polypus of the frontal sinus is reported as having occurred in the practice of Sir Wm. Wilde (see *British Medical Journal*, Jan. 16, 1869, and Case XXV in the Appendix.) The symptoms were displacement of the eyeball outwards and forwards; a filling up of the hollow between the eye and nose by a firm substance, the skin over this being red,

congested, and painful when touched; and a polypus evident in the right nostril, &c. The history was that two years before the eye began to swell, and that the swelling had since increased.

In a case recorded by Dr. Wuth, the polypi were confined to the frontal sinus, and though causing much distortion of the surrounding parts in consequence of their bulk, they were removed successfully by trephining the sinus. The patient, a boy of 10, made a good recovery. (See Case No. XXIV in the Appendix.)

The above case is very encouraging as regards treatment, and may be taken as a typical instance for guidance in future examples of this rare affection.

Subsection 7.—*Osteoma.*

Bony tumours have a preference for this particular region of the body. Some of the most remarkable instances of large ivory exostosis having made their way to the surface through the anterior ethmoidal cells. The tumours thus presenting might therefore offer some difficulty in diagnosis, for we have seen that the chronic enlargements of the sinus due to collections of mucus, the presence of hydatids, and chronic abscess, are not at first distinguishable from bony tumours, the first stage of the enlargement being a uniform distension of the bony walls, but affecting generally and chiefly the orbitar surfaces. The very slow progress of true bony growths and their persistent hardness would, in most cases, serve to distinguish them from all other tumours or swellings. The very fact of a slowly-growing tumour of bony hardness presenting through the superciliary eminences, or at the inner angle of the orbit, if it be unaccompanied by evidence of inflammation in the part, or of obstruction in, or discharge from, the nostrils, is a strong *prima facie* evidence of an osteoma. The great rarity of this affection, however, should make the surgeon very cautious in his diagnosis.

As curiosities in surgery, the following instances of osteoma may not be without interest. The number of recorded cases

is so small that it is hardly possible to draw conclusions of pathological interest from them, but they serve to show that the frontal sinuses may be the starting points of true bony growths, and that in other cases the growths may commence in the diploe of the frontal bone, and invade the sinuses afterwards in the progress of their growth.

Case.—J. Arnold reports in Virchow's *Archiv*, vol. lvii, two bony tumours of the anterior region of the skull, which are remarkable examples of what has been called by Virchow enostosis, or osteoma developed from the diploe. Both tumours agreed almost entirely in their situation and mode of development, but differed in the rate of growth, in that one only of them represented an advanced stage. *Both had their origin at the posterior and lower part of the wall of the frontal sinus, where the ethmoid bone approaches the part* (here alone was there a close connection between the tumours and the wall of the sinuses), and thence grew into and distended the sinuses. One of them broke through the wall at separate points above, below, and in front; the large projections of the other pressed on the orbits, nasal cavities, and skull, destroying the anterior lamellæ of the frontal bone, so that *the only guide to its origin in the frontal sinus was the presence on it of some mucous membrane with ciliated epithelium.* Both tumours had a thin layer of connective tissue on their outer surface. The smaller one consisted entirely of ivory-like masses, while the larger one had this structure on the outside only, the interior being formed of a spongy tissue. Arnold believes that in these two cases, and in twelve others of which he has been able to find records, the tumours must have either been developed from the endosteum by the direct formation of bone-substance, or by bony transformation of enchondromata which themselves had their origin from the endosteum or from the remains of cartilage. In one of Arnold's cases, the patient was only twenty-three years of age; and Virchow has already observed that the occurrence of the disease in early life points to its origin, in many cases, in disturbance of the formation of bone.—Extract from the *British Medical Journal*, Feb. 14, 1874.

There is a remarkable specimen of exostosis of the frontal sinus of an ox (specimen in Mus., Coll. Surg., 3216). It is a spheroidal mass of ivory, measuring 8½ inches in diameter, and weighing upwards of 16 pounds. It originated apparently in the frontal sinuses.

Case.—Rokitansky describes in an individual, æt. 16 years, who had exophthalmia, a tumour coming out of the diploe of the frontal bone, very dense, and of a dead-white colour. This tumour extended into the anterior cranial fossa by one nodule; by another into the orbitar cavity, and in the zygomatic fossa by another. Other small tumours proceeding from the diploe were found on the frontal, and on the great wing of the sphenoid.

Case.—A case of bony tumour is described by Baillie (the preparation of which is in the Hunterian Museum), the greater part of which is of the ivory-like kind, but having the posterior and interior portions of the spongy kind. The tumour filled the frontal sinuses and the upper part of the left orbit, but it also penetrated the right orbit, and projected more than an inch from the inner and outer tables of the skull. In front it bursts out, as it were, through special orifices of the outer table; the margins of these openings are thin, and expanded for a short distance over the surface of the tumour.

A much larger specimen is in the museum of the Cambridge University, and a very beautiful engraving of this specimen will be found in Sir James Paget's lectures, p. 538. Sir James Paget also relates the case of another similar tumour in St. Bartholomew's Hospital Museum. "A girl, æt. 20 years was admitted with protrusion of the left eye-ball, which appeared due to an osseous growth projecting at the anterior upper and inner part of the orbit. None but the anterior boundaries of the growth could be discovered. It had been observed protruding from the eye for three years, and had regularly increased; it was still increasing, and produced severe pain in the eye-ball, and about the side of the head and face. It seemed, therefore, necessary to attempt the removal of the tumour, or at least to remove some part of it, with the hope

that the disturbance of its growth might lead to its necrosis and separation. A portion of it was with great difficulty sawn off, but the patient died with suppuration of the membranes of the interior part of the cerebrum."

I have ventured to suggest that the occurrence of these enostotic tumours in this region is due to some disturbance in the processes of development of the body of the pre-sphenoid or frontal vertebræ of the fœtus (see "Abscess and Tumours of the Orbit," part ii, p. 25.) In the fœtus this region is occupied by cartilage, the spongy tissue being developed much later in life; hence it is easy to suppose that some accidental disturbance of the processes might give rise to an increased bony deposit, resulting in an enostosis, and in the arrest of the hollowing out of the parts into spongy tissue. This view, in some measure, explains the remarkably early development of these bony growths, and perhaps accounts for their association with cysts, lined with ciliated epithelium (see the case from Virchow's "krankhaften Geschwülste," vol. ii, p. 48, et seq.), and described by Virchow under the name of "Osteoma cystomatosum orbitæ."

Case.—In a male adult, in whose orbit nothing abnormal had been noticed during life, was found after death a large tumour, softened in the centre, which occupied almost the whole anterior right lobe of the brain. When cut in two a limpid and yellowish fluid escaped, and brought into view a regular wall formed of a fibrous tissue, soft, mucous, and coloured by various yellowish brown pigments. This tumour was not sharply defined on the cerebral aspect, but was gradually lost in the *neuroglia*, so as to represent a cystoid myxoma. To this tumour were attached a series of pouches, some of them closed, some communicating with each other, of various sizes. These pouches were easily separable from the brain, but they adhered firmly to the anterior cranial fossa. . . Some contained a viscous fluid. . . A closer examination of the *wall of the cysts showed a layer of cylindrical vibratile epithelium.* At the part of the anterior cranial fossa to which the tumour was adherent, it was also closely adherent to the

os frontis as well as to the dura mater. On removing it, it seemed at first to have penetrated into the frontal bone. . . *The true base*

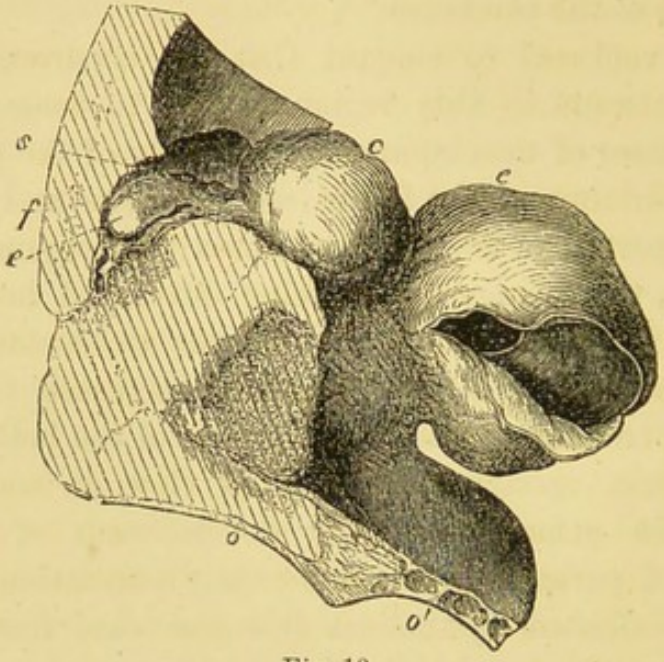


Fig. 13.

(*After Virchow*) Osteoma Cystomatosum Orbitæ.

f Vertical portion of frontal bone. *o o'* Orbitæ portion. *c c* Multi loculæ cysts. At *o'* the normal spaces of the diploe.

of the tumour was an osseous irregularly rugose growth, which projected from the angle formed by the frontal and orbitar portions of the os frontis. This growth, almost the size of half a hen's egg, was prolonged into the substance of the frontal by a broad base. When the front face of this bone was exposed, several rounded knobs were seen, perfectly smooth, apparently very dense, *which pierced, at the superciliary border, the anterior table of the os frontis, and were beginning to grow outwards.* On a perpendicular section, through the whole region, the tumour measuring 4·8 centimètres across, is seen to start from the diploe of the os frontis, to have been enclosed distinctly, at the orbitar region between the two tables of the frontal. It penetrated them inwards and outwards. . . . The greater part of the tumour was made up of a very dense ivory-like tissue, and only at two points near the periphery a more porous and vascular substance

was discovered. In the ivory-like portion a lobulated structure was made out. Where it perforated the outer table of the frontal, it was only covered by periosteum. But it also perforated at several other places, by points of the size of a lentil, into the orbit itself. In all these regions the tumour contained cysts, with an internal lining of vibratile epithelium and mucus contents. Two similar cases, one by Busch and one by Petit, are also alluded to by Virchow.—C. Hoppe, loc. cit., pp. 22, 24, and J. L. Petit, "Traité des Mal des Os," p. 428.

Virchow remarks on the probability of such cystic growths being congenital, and hints at their probable analogy with the congenital hygromes of the sacrum — sacral-hygroma.— Virchow, op. cit., vol. ii, p. 52.

Some remarks made by Sir Everard Home, in the "Philosophical Transactions," vol. lxxxix, p. 239, seem to point to the possibility that some of these ivory exostoses spring from a vascular pulp resembling the tooth-pulp of the graminivorous quadrupeds.

Referring to the origin of these ivory exostoses of the frontal sinuses, "I have seen two instances," he says, "and was unable at the time to account for them, but am now induced to believe they were formed upon vascular excrescences growing from the lining membrane of the sinuses similar in their organization to the pulps above mentioned," *i.e.* the pulps of the teeth of graminivorous quadrupeds. This view of the origin of these tumours is confirmed by the remark made by Dr. Stephenson, that in the case operated on by him "*the lining membrane was diseased and had a very small fungus attached to it*," this very small fungus being probably a vascular pulp, such as Sir E. Home alludes to. (See Case No. XXVI in the Appendix.)

Treatment.—The close proximity of the sinuses to the anterior cranial fossa, and the circumstance that these tumours often extend backwards as well as forwards, and in fact often extend into the cranial fossæ without causing any great prominence anteriorly, forbid any operative interference. If a case should present itself in which the tumour evidently springs from the

anterior table of the frontal, only secondarily involving the frontal sinuses, or if the sinuses have been invaded by a tumour springing from some neighbouring bone, the question of operation might be entertained with more hopeful prospects of its utility, but even then the dangers of interference would probably largely outweigh the benefits expected.

Sir James Paget, in his "Lectures on Surgical Pathology," remarks on the exceeding difficulty and danger of operations upon these tumours if they grow inwards; those that only grow outwards may be removed, but not without great difficulty.

Subsection 8.—*Foreign Bodies in the Frontal Sinuses.*

Living foreign bodies have been found in these cavities. Many instances have been recorded of persons having discharged worms or caterpillars from the nostrils after having experienced disturbances that make it evident that the worms were developed in the frontal sinuses. Saltzman thinks that the eggs of these worms enter the nostrils when in the act of smelling flowers or fruits in which they have been deposited by the moth. It is some confirmation of this conjecture that women, who are more in the habit of carrying flowers about with them, are more subject to this accident than men.

The *symptoms* caused by the presence of worms in the frontal sinuses are very striking, but not sufficiently so to lead to an unfailing diagnosis. Pain, sometimes violent, but always very troublesome, is felt in the front of the head, near the root of the nose. It sometimes extends to the temples or occiput. At one time there is only a tingling; at others an intolerable pain that causes fainting, vertigo and even sudden and temporary blindness. Patients have been seized with maniacal delirium which has only stopped when the worms have been expelled. Pozzi and Schneider have both reported examples of this singular kind of mania. It is thought that the alternate calm and accessions of pain depend on the repose or movements of the insect.

Sometimes the nostril is dry; at other times the mucous secretion is very copious. Some patients have frequent sneezing and a continual desire to scratch the nose; some thrust their fingers continually into their nostrils; others dribble from the mouth; others again are tortured by the constant presence of fœtid odours.

This disorder is very difficult to recognize, and consequently very difficult to treat, but the douche apparatus with the head inclined to one side and lower than the rest of the body, would offer some chance of dislodging the insects; and one saline solution having failed, the effect might be varied by trying another. Common salt is generally very distasteful to most grubs, caterpillars, and insects; but if this did not succeed, the permanganates or carbolic acid in very weak solution might be tried.

In the event of this plan failing, it would be perhaps more easy to reach the sinus on the side affected by injecting one nostril while the posterior aperture of the same side was closed by a plug previously introduced into it in the ordinary way.

Dr. W. R. Lawson states (*Medical Times and Gazette*, Feb. 6th, 1875) that in the case of a white soldier at Demerara, after the failure of injections of various descriptions, the insufflation of snuff produced a speedy cure, the tobacco acting as a poison on the maggots.

There are few surgeons probably who, with the uncertainty of diagnosis always present in such cases, would propose to trephine the frontal sinus.

We are told, in the "Ephemerides des Curieux de la Nature," that after an attack of epistaxis, a worm in the form of a leech came from the nostrils. This, however, was most probably only a clot of blood.

In the "Annales de la Société Entomologique de France" we find an account of a condemned prisoner, who died from the effects of a quantity of the larvæ of a fly (lucilia hominis vorax) having been deposited in his frontal sinuses and nasal fossæ. "Facts of this kind appear to be common at Guyane. M. Saint-Pair has observed six such cases. In one more than 300 larvæ

were extracted by means of injections, but it was impossible to get them all out; they soon were seen invading the eyeball, and creeping between the eyelids; the lower eyelid became gangrenous, and fell down on the cheek, leaving the margin of the orbit exposed. The worms attacked the mouth and gums, and denuded the superior maxilla. The patient died eighteen days after admission to the hospital."*

An extraordinary story is told by Dr. Raourc, of Nismes: a woman was attacked with a fever, with violent headache, which, in spite of remedies, made continual progress. About the fourth or fifth day she began sneezing, and expelled some small white worms. Her headache diminished sensibly as the worms came out. Seventy-two of them were expelled in the course of a few hours, and the patient was completely cured. These worms were exactly like those that are found in the frontal sinuses of sheep, and as the woman had, the day before her attack, drunk of some water at a pond to which sheep were in the habit of being led to water, the author of this record thinks that she was infected by the worms in this way.

Foreign bodies of an inanimate kind are sometimes lodged in the frontal sinuses for a long period without causing much disturbance. In gunshot wounds the ball is not unlikely to be deposited here, as seems to have been the case in several recorded instances. The ball may not go beyond the cavity, or it may at last find its way through the nose. (See Case No. XXVII in the Appendix.)

* According to a correspondent of the *Medical Times and Gazette* (Jan. 30, 1875) on the subject of "Native Practice in Rajpootana," worms in the nose or "penash" is an ordinarily common malady; not only in human beings, but also in camels, caused by the ring-hole in the nasal septum of the latter ulcerating and becoming a nidus for the deposit of larvæ. But with human beings, or at least with men, who do not wear nose-rings, there is not this excuse ready to hand for the entrance of flies; but doubtless most have witnessed the apathy with which the natives permit clusters of flies round the eyes and nostrils. Probably maggots may arrive at maturity without any previous ulceration. A case is related by the author of the above report in the *Indian Medical Gazette*, Aug. 18, 1874 (see Case LXVII in Appendix).

SECTION VI.

Diseases of the Antrum of Highmore.

Subsection 1. Anatomy.

„ 2. Injuries and Lodgment of Foreign Bodies.

„ 3. Abscess of, or Suppuration in, the Antrum.

„ 4. Cysts.

„ 5. Solid Tumours.

„ 6. The Treatment of Polypi and Solid Tumours in the Antrum.

Subsection 1.—*Anatomy.*

The antrum of Highmore, "Oberkieferhöhle" of the Germans, and "sinus maxillaire" of the French, was described by Isaac Highmore, in 1651, "as conical and somewhat oblong." Some quaint woodcuts in Highmore's work* (reproduced in the "Transactions of the Odontological Society," vol. ii, in a paper by Mr. W. A. N. Cattlin, F.R.C.S., and also in Mr. Christopher Heath's valuable treatise "On the Jaws") give a very inadequate idea of the actual antrum, its shape, or anatomical relations. It has been described as "a large triangular-shaped cavity, hollowed out in the body of the superior maxillary bone; its apex, directed outwards, is formed by the malar process; its base, by the outer wall of the nose." (Gray's "Anatomy," p. 52.) It is more correctly described by Mr. Luther Holden as "a triangular pyramid" in shape. Its roof is formed by the orbital plate, its floor by the alveolar process, bounded in front by the facial surface, and the canine fossa, and behind by the zygomatic fossa. Its inner wall, in the dry disarticulated bone, has an aperture of variable size, which is partly closed in by the bones articulating with it, viz., the ethmoid above, the inferior turbinated below, and the palate bone behind. The antrum communicates with the middle meatus of the nose through this aperture, which is overlapped in the recent subject by mucous membrane, and presents, towards the meatus, a mere slit or valvular opening, almost hidden in the funnel-shaped channel (the infundibulum) into which open the anterior ethmoidal cells. There is sometimes a second circular hole, about half-an-inch or less behind the normal and more constant aperture.

* I. Highmore, "Corporis Humani Diss. Anatomicæ." Hagæ, 1651.

According to M. Giraldès ("Recherches sur les Kystes Muqueuses du Sinus Maxillaire," Paris, 1860), this posterior opening is very often the result of pathological change. It is important to note this, as the operation of passing a sound or catheter into the antrum, through the anterior nares, has been proposed, and it is evidently extremely difficult to perform this operation unless we either break through the mucous membrane and the outer bony wall of the nares, or accidentally succeed in meeting with the posterior aperture.

The cavity of the antrum is variable in size, and by a reference to Mr. Cattlin's treatise above mentioned, we find that it is larger in men than in women, and that it diminishes in size in extreme age; being small also in young children, in whom the walls are comparatively thick. An adult antrum, of average size, will hold two and a half drachms of fluid, while a very large one is capable of containing eight drachms, and a very small one only one drachm. A series of wax casts, taken from the antra of seven or eight individuals of varying ages, in the museum of the Dental Hospital, show very clearly the great variability in size and shape of this cavity in different persons. The interior is, in some few specimens, nearly smooth, but in most there are ridges or thin plates of bone projecting into the cavity from the outer or anterior wall, forming incomplete separations, and dividing it into fossæ, giving it some resemblance to the sphenoidal and ethmoidal cells. Projecting into the floor are several conical processes, corresponding to the roots of the first and second molar teeth, and in some cases the floor is actually perforated by them. The walls are thinner in the canine fossa than in the parts immediately surrounding it, and are again thin on the posterior aspect of the outer wall above the molars. The antrum is developed before any of the other sinuses, its cavity being traceable about the fourth month of fœtal life. The mucous membrane is thin, pale, closely adherent to the periosteum, covered with columnar ciliated epithelium, and like that of the other accessory sinuses, has a resemblance to a serous membrane. It is thicker and more adherent to the internal

wall, and is at this part abundantly supplied with mucous follicular glands, closely aggregated near the orifice of communication with the nostril, but more sparsely distributed in other parts.

These glands, seen with the naked eye after maceration and soaking in dilute nitric acid, have the appearance of yellowish opaque dots, of about half the size of a pin's head (see plate I. fig. 3). These dots are produced by the glandular epithelium being rendered opaque by the acid. Examined by a lens, each gland is seen to consist of a simple or bifurcated tube terminating in a follicular mass, composed of a certain number of culs-de-sac communicating with the principal tube. These follicular glands lie in the cellular tissue which separates the mucous membrane from the periosteum (see plate I, fig. 4 and fig. 5).

The secretion of these glands, in the normal condition, is a transparent glairy mucus, which is only poured out in sufficient quantity to keep the surface moist, but may be increased in quantity, and rendered more opaque and puriform, during any catarrhal or inflammatory attack.

At some parts of its extent the mucous membrane presents rudimentary papillæ, which become more easily recognised when the membrane is hypertrophied.

Subsection 2.—*Injuries and the Lodgment of Foreign Bodies.*

The antrum can only be injured from without by very crushing and violent blows (by which the upper jaw and its soft coverings are much bruised and lacerated), by gunshot wounds, or by penetrating wounds with a sharp or pointed weapon. Fractures of the upper jaw, laying open the antrum, are serious, rather on account of the injury to the bone and the shock to the system, than in reference to implication of the cavity. Nevertheless, there is some risk of a troublesome suppuration in the antrum, complicating the principal injury, and a permanent fistulous opening may result. A case of the kind is at present under my care at the Great Northern Hospital. The young man, whose case is reported (see Case, No. LXa) in the Appendix,

was kicked in the face by a young horse he was training at the time; both jawbones were fractured, and the whole of his face was fearfully lacerated. He made a good recovery, but with great distortion of the features, and on the left cheek a fistulous opening remained eight years after the accident, the skin being drawn down into a deep funnel-shaped opening. This was afterwards closed by a plastic operation, the details of which will be explained in a subsequent section.

Mr. Hutchinson had a case of transverse fracture of the jaw in the London Hospital. Both antra were laid open, but a good recovery was made without exfoliation of bone. Several similar cases are recorded in Mr. Christopher Heath's work on "Injuries and Diseases of the Jaws," pp. 55, 56.

In the case of gunshot wounds, the missile is sometimes lodged in the antrum, and it is then a point of importance to extract it as soon as possible. Fragments of broken bone may, in some cases, have to be removed in order to reach the foreign body, but it is of course very desirable to avoid this if possible; the bones being, in this region, even when much displaced from their normal position, more favourably circumstanced for recovery without necrosis, than in less vascular parts of the body. The foreign body may, however, remain embedded in the cavity of the antrum for a long period after the receipt of the injury without its presence being suspected. In the *Edinburgh Medical Journal* of September, 1856, is a case reported by Dr. Fraser, of Newfoundland, who removed a piece of metal weighing more than four ounces, part of a burst fowling piece, from the upper jaw, where it had lain eight years (see Case XXVIII in the Appendix). In the museum of Guy's Hospital is the model of the breech of a gun, which had been lodged in the face of a man for twenty-one years. "The patient was shooting birds when the gun burst; the right eye was destroyed, and through the roof of the orbit the brain protruded. At the end of 1856 he was suddenly seized with symptoms of choking, as from a foreign body in the throat, and, on putting his finger in his mouth to remove it, he drew forth the breech of a gun, much

oxidized and covered with purulent matter. It is supposed that the piece of iron broke through the floor of the orbit, and had been lodging in the antrum ever since."

Bordenave ("Mémoires de l'Académie Royale de Chirurgie," tom. v, p. 255) records an instance of a nail, from a gun, having entered the antrum and caused a fistula in its walls.

Louis records, in the "Mémoires" (tom. iv, p. 380), the case of an ecclesiastic, who had a fistulous opening in the cheek from which a foul-smelling discharge escaped. Injections made through this opening passed into the mouth, through the socket of a molar tooth, which had been previously extracted. This part of the alveolar process was carious; one of the injections forced out through this socket a pledget of lint which the patient had some time before thrust into the sinus, and of the presence of which he was not in the least aware. This pledget of lint had been the cause of the mischief.

The late Mr. Holmes Coote, in his article on injuries of the face (in Holmes' "System of Surgery"), relates the following somewhat similar case. "A young man consulted Mr. Lawrence in consequence of his suffering from discharge of the left nostril, accompanied with enlargement of the corresponding superior maxillary bone, which was soft and yielding. A probe introduced into the socket of the second molar tooth passed readily into the antrum, and allowed the escape of some thin sero-purulent fluid. In the course of a few weeks, a small bit of lint escaped from the antrum through the socket of the tooth, the discharge from the nose ceased, the cheek regained its normal size, and the man recovered. It turned out that the lint had been used, steeped in laudanum, for plugging the socket and relieving a temporary attack of face-ache."

There are, therefore, dangers often of an unexpected kind, in the use of appliances apparently the most simple, in some instances leading to results as formidable as those of most crushing injuries.

Subsection 3.

Abscess of, or *Suppuration in, the Antrum*, may be induced by extension of severe catarrhal, syphilitic, herpetic, or variolous inflammation from the neighbouring nasal fossæ, and is probably, in such cases, partly due to the accidental closure of the aperture into the nostril by the swelling of the surrounding mucous membrane, or possibly by the plugging of the aperture with inspissated mucus. Caries of the teeth, the roots of which are in communication with the cavity; caries or necrosis (see Case XXIX in Appendix) of the alveolar ridge; the thrusting of a tooth into the sinus in an endeavour to extract it; injuries and lodgment of foreign bodies—these are all exciting causes of suppuration in the antrum. By far the most frequent cause appears to be the extension of suppuration from the root of a carious tooth, or from the periosteum surrounding it (for cases, see Appendix, Case XXX). The retention of mucus from any cause is not uncommonly associated with or followed by suppuration, polypi of the nasal fossæ, or of the antrum itself, and tumours of any kind in its cavity or neighbourhood, may excite suppuration, and so complicate the case as to render the diagnosis very difficult. A case of abscess, depending upon the presence of polypi in the antrum, occurred to me at the Central London Opthalmic Hospital (see Case XXXI in the Appendix); the case terminating by the discharge through the mouth of decomposed masses of sloughing tissue; and in the *Edinburgh Medical Review* (October, 1867) a case is recorded as having been under M. Demarquay with symptoms of abscess (such as "the discharge of large quantities of pus through fistulous openings into the mouth and through the sockets of several teeth"), in which he removed the whole upper jaw, and, on examining the diseased part, found a bony tumour lying loose in the antrum, like the kernel of a nut in its shell (see Case XXXII in the Appendix).

The general health of the patient is almost always in fault, and the exciting cause would not produce suppuration, unless

the constitutional dyscrasia was favourable to its development. Scrofula, and the furuncular cachexia, are the most common forms of constitutional debility in which purulent inflammation of the antrum is likely to occur. Syphilis does not appear to be commonly associated with it, but the abuse of mercury is thought to have a predisposing influence, though the evidence on this point is very insufficient.

Abscess of the antrum has been caused in a newly-born infant from injuries received during parturition, the face having presented itself under the pubes (Druitt's "Surgeon's Vade Mecum," p. 431; and *Medical Times and Gazette,* N.S., vol. iv, p. 860). I have myself seen two cases of abscess of the antrum in very young children, in whom I had reason to suppose the mischief was connected with injuries received during parturition.

Symptoms.—The physical signs of suppuration in this cavity will necessarily differ according to the exciting cause, and when there is a means of exit for the discharge, either through the natural opening into the nasal fossæ, or through a socket of a tooth, or a fistulous opening elsewhere, there will not be the pain, swelling and distension which are usually the accompaniments of a confined abscess.

In some cases the only indication of suppuration going on in the antrum, is the ozænic stench and the occasional discharge of pus. Trousseau relates that he was consulted, on account of ozæna, by a gentleman of forty years of age, who was in good health, except for this source of discomfort. When told to close his mouth and breathe through his nose, Trousseau could detect no bad odour. This gentleman then said that he could produce the stench at will; he sat down, with his head inclined very much downwards, and discharged into his pocket-handkerchief a large quantity of horribly stinking pus. There was probably some necrosed bone in the antrum with suppuration, but without occlusion of the antral orifice into the nasal fossæ. This case may be taken as typical of the class, there being no pain nor distension, and no external objective signs whatever of the presence of pus in the antral cavity; occasional or constant

ozæna, and occasional discharge of offensive pus, being the only signs of the disease. (A similar case, viz., Case XXX, is cited in the Appendix.) The position of the head during the discharge of pus, when this is capable of control (as in the case of Trousseau's patient), is a very conclusive evidence of the seat of the disease. It is not, however, an invariable or even common symptom, though, when present, it is one of great value.

Diagnosis.—In a case of ozæna, with occasional or intermittent discharge of fœtid pus, especially if the discharge only takes place when the head is held downwards, or on one side, there is probably suppuration within the antrum, and this may depend upon a necrosed piece of bone lying loose, or in process of separation from the sound parts, or upon a decayed tooth the fang of which communicates with the cavity. In most instances the necrosis will be found to be associated with a decayed tooth, one fang of which perhaps is protruding into the cavity. It is not, however, invariably from this cause. There may be a foreign body of some kind lying loose in the cavity, irritating the lining membrane, but the condition of the teeth must be very closely examined, and in the event of one of them being decayed and tender to the touch, there is every probability of its being the source of the mischief in the antrum. Examination of the nostrils, by means of the speculum, should not be omitted, though the evidence conveyed by it may be merely negative. But it may disclose a trickling of pus into the middle meatus, and if, on inclining the patient's head to the opposite side and again examining the nostril, we find that the flow of pus into the middle meatus is very much increased, the diagnosis is rendered much clearer as to the antrum being the part involved (see Case XXX in the Appendix).

Treatment.—The cause being discovered; if it should be concluded that a decayed and tender tooth is at fault, it should be extracted, and the cavity can then be opened through the socket. If pus escape from this opening, it may be syringed out, freely and frequently, with a hope of bringing away any irritating piece of necrosed bone, a misplaced tooth, or foreign

body. But in the event of the discharge continuing, the opening must be enlarged and the antrum thoroughly explored with the probe, or a scoop, such as that used by Mr. Cattlin under similar circumstances (see "Odontological Society's Transactions," vol. ii, p. 39), remembering that there may be incomplete septa running across the cavity, and that a foreign body may easily be concealed in one of those compartments or fossæ that are so commonly seen in the antrum. The possibility of polypi or other tumours being present, and being themselves the exciting causes of the suppuration, should be borne in mind, and the treatment will have to be modified as the circumstances of the case require (see Case XXXI and Case XXXII in the Appendix).

Symptoms of Abscess when the matter is confined.—When there is undoubted obstruction in the orifice, the symptoms are those of confined pus, and resemble the condition of true abscess within bony structures elsewhere, but with some special features peculiar to the region involved.

There is dull, aching pain in the jaw extending up to the orbit, and along the alveolar processes. This may be ushered in with rigors, and associated with general febrile disturbance in acute cases, but more commonly the pain remains as the only symptom for some time, and then a gradual swelling of the jaw comes on, the pain becomes more acute and throbbing, and rigors, increased temperature, restlessness and febrile irritability are speedily developed. As the jaw-bone is expanded, various alterations in the shape and relations of the surrounding parts are noticed. The malar bone is elevated, the molar teeth are thrust downwards so as to appear elongated in the mouth; the hard palate is depressed and becomes flat or even convex downwards; the nostril of the side affected becomes narrowed or entirely obstructed; the eyeball is thrust upwards and outwards. Mr. Salter has recorded instances in which, besides the protrusion of the eyeball in advanced cases of abscess of the antrum, there was also amaurosis, consequent upon periosteal inflammation extending into the orbit and involving the sheath of the optic

nerve (see Mr. S. James A. Salter's article "On the Teeth," &c., in Holmes's "System of Surgery;" and the article in *Medico-Chirurgical Transactions*, vol. xlv, by the same author).

When expansion has gone on to the extent described—though it by no means follows that all the above symptoms will be present in every case—there will very often be some spot or space on the anterior surface, or in the hard palate, at which fluctuation is perceptible. In almost all such cases a molar tooth is decayed and has been the cause of the mischief. It must be looked for, but if there be no such offender we must look out for some presenting soft part of the swelling, and, though no fluctuation may be felt, there may be some portion of the walls so thin that it yields under pressure, giving to the finger the sensation of dry, tightly-stretched parchment.

If in doubt as to the presence of fluid, a fine trocar and canula thrust into the presenting part will solve the mystery, and also give evidence of the kind of fluid contained in the cavity. But it may happen that the teeth are all apparently sound, and yet one of them may be the cause of the purulent collection within the antrum, in consequence of the death of the fang, the symptoms of which are not by any means easily detected. A skilful dentist, however, is sometimes able to get information on this point by striking the crowns of the teeth in succession with a metallic rod, until one of them is found to be more sensitive than the rest, and he then proceeds to test the condition of the pulp cavity of the suspected tooth. If he finds that the pulp cavity in any fang is not transparent, but somewhat opaque as compared with the other teeth, he concludes that the pulp of that particular fang is dead, and may be causing irritation by its presence in the floor of the antrum. An instance of such an obscure cause of abscess in the antrum, and of its detection, is given by Dr. Garretson ("Diseases of the Mouth and Jaws," p. 427; see Case XXXIII in the Appendix).

Progress.—If not interrupted by treatment, the pus makes its way out either through the cheek below the orbit, through the

palate, through the nostril or the anterior wall of the antrum, or, lastly, through the socket of a decayed tooth in the alveolar process.

In some instances, before giving way, the cheek becomes enormously distended, and all the structures attenuated, so that the abscess forms a mere membranous bag, the bone having been completely absorbed over a large extent of its surface. An instance of this kind is recorded by Sir Wm. Fergusson, in whose work on "Surgery" is a woodcut representing the face of an aged woman, the left side of whose face is disfigured by a falling in of all the tissues; but at the upper part of the cheek there is an oblique bony ridge, the remains of the bony shell of the antrum, which had become distended by the contained fluid. In the Anatomical Museum of King's College the condition of the antrum in this case after death (specimen marked $\frac{1209}{3}$) is shown. The integuments have been dissected off, and the interior of the antrum exposed. The aperture in the bony walls, which was covered in by membrane only, is at least two inches in diameter. There is no communication between the antrum and the nose or mouth.

It sometimes happens that the abscess in the antrum is associated with very extensive disease of the bones of the base of the skull, and in such instances meningitis and death have occurred. In a case of scrofulous abscess of the orbit, under my observation in 1866, the antrum was found after death to be full of fœtid pus, and the floor of the orbit was carious. It was probable, however, that the disease of the antrum was, in this case, only secondary to the original mischief in the orbit (see Case XXXIV in the Appendix).

Diagnosis.—The symptoms, in the early stages of the malady, are somewhat indefinite and unreliable. There is a dull aching pain of the cheek and jaw, and this pain is referred to the whole of the jaw and the floor of the orbit, and not to the alveolar ridge only, as in ordinary periostitis of the alveolus, preceding gumboil, or associated with carious teeth. There is also some swelling of the soft parts, and tenderness spread over the whole

antral region, and not confined to one spot or region of the jaw, nor to the region of the lachrymal sac. The nostril of the side affected is dryer than usual, there is heat of the parts, but no superficial redness. Nearly always one tooth, a bicuspid or a molar of the affected side, is decayed and painful, or diseased in some less obvious way.

Later on the distortion of the surrounding parts indicates the region whence the enlargement has started, but in the early stages, unless some part of the bony walls has become much attenuated, the nature of the enlargement is less obvious, and, in some cases, the distension of the sinus goes on for years so slowly and painlessly, and with so complete an absence of febrile disturbance, that the idea of abscess is not prominently suggested. Hence it has, on more than one occasion, been supposed that a tumour of the upper jaw was present, and the most careful and experienced surgeons have been led into an error of diagnosis on this point. It is *said* that Gensoul of Lyons (who performed the first operation of excision of the upper jaw) once cut down upon the cheek, with the intention of removing the upper jaw, when the case was not one of tumour, but of purulent accumulation within the antrum; but I am unable to find any authentic record of the case (see Case XXXV in Appendiz; see also a case under the care of Mr. Henry Smith, *British Medical Journal* March 2, 1867, Case XXXVI in Appendix). The importance of arriving at a certain conclusion as to the presence of pus in the antrum under these circumstances, before proceeding to any operation for the removal of a tumour, cannot be too strongly insisted on, and it should therefore be the rule before operating always to perforate the cavity, either through the socket of a molar tooth, or through some expanded part of the anterior wall, or through the outer wall of the nasal fossa. This proceeding has, on two or three occasions, saved the surgeon from the discredit of removing the upper jaw for an abscess of the antrum.

The rare complication of abscess with tumour must not be overlooked, for several instances of the kind are on record. In

the College of Surgeons' Museum there is a specimen of fibrous tumour of the upper jaw and occupying the antrum, removed by Mr. Liston. Before the operation for its removal, the antrum had been perforated and pus evacuated, and at the upper part of the preparation there is a small cavity, which contained pus. There can be little doubt that the irritation of the tumour encroaching on the antrum excited inflammation, and the formation of abscess. M. Demarquay has placed on record a very remarkable instance, already alluded to, of a bony tumour lying loose in the antrum, as if it had become accidentally cut off from its nutrient vessels, and had become necrosed in consequence. The symptoms very closely resembled those of abscess due to necrosed bone (see Case XXXII in Appendix). In forming our diagnosis, therefore, we must not conclude that, because a given tumour or swelling of the antrum contains pus, we have a simple abscess to deal with. There is almost in every case some irritating cause of the abscess whether a polypus, or a piece of necrosed bone, or a carious tooth, or a congenitally misplaced tooth, or a foreign body. In the large majority of cases, a decayed molar tooth, the fang of which projects into the cavity, is the exciting cause of the abscess. Nor, on the other hand, does the presence of a tumour negative the co-existence of an abscess. Protrusion of the eyeball is only occasionally observed as a symptom, and does not appear to be present at all during the early stages of the disease, unless the floor of the orbit happens to have been the starting point of the mischief, and the antrum has become secondarily involved. This was the case with the boy Burbidge (Case XXXIV in the Appendix), in whom the exophthalmus was the earliest symptom, and was evidently due to scrofulous caries of the floor of the orbit, in consequence of which the antrum subsequently suppurated. So, too, in M. Dubois' case (Case XXXV in the Appendix), the original cause of the distension of the antrum was the presence of a misplaced canine tooth, close under the floor of the orbit.

At later stages of the case the eyeball may be protruded, in common with all the structures surrounding the cavity, but

exophthalmus is not invariably observed even in this period of the malady.

The Prognosis is almost always favourable; it is only when the surrounding bones are extensively involved, and especially when there is reason to believe that the bones at the base of the skull are carious or necrosed, that there is any reason to anticipate danger to life (see Case XXXIV in the Appendix). If, however, in the course of a fever or erysipelas, or after an operation on the jaws, such as tooth-drawing, or an injury to any of the bones of the antral walls, a sudden access of pain and distension in the cheek and jaw, with protrusion of one or both eyeballs, and delirium, convulsions, or coma, or other cerebral symptoms make their appearance, there is some reason to fear that intracranial abscesses and meningitis have set in, and the issue will be probably fatal within a very few days (see Case XXXVII in Appendix); but such instances are exceedingly rare, and can only occur when the patient is in a very unhealthy state, or is exposed to some unhealthy influences, such as pyæmic infection or the poisons of contagious fevers.

The *treatment* was laid down by John Hunter, and his rules will hold good for the majority of cases we have to deal with.*

"The first part of the cure, as well as of that of all other abscesses, is to make an opening, but not in the part where it threatens to point, for that would generally be through the skin of the cheek. If the disease is known early, before it has caused the destruction of the fore-part of the bone, there are two ways of opening the abscess: one by perforating the partition between the antrum and the nose, which may be done; and the other by drawing the first or second grinder of that side, and perforating the partition between the root of the alveolar process and the antrum, so that the matter may be discharged for the future that way.

But if the fore part of the bone has been destroyed, an opening may be made on the inside of the lip, where the abscess most probably will be felt; but this will be more apt

* The works of John Hunter, F.R.S., edited by James F. Palmer, vol. ii, p. 78.

than the other perforation to heal, and thereby may occasion a new accumulation; which is to be avoided, if possible, by putting in practice all the common methods of preventing openings from healing or closing up; but this practice will prove rather troublesome; therefore the drawing the tooth is to be preferred, because it is not so liable to this objection."

Having made an opening, the probe should be introduced with a view to ascertain whether there is any foreign body or necrosed bone in the cavity. If there be, it will be necessary to enlarge the opening, by cutting away portions of the bony walls to an extent sufficient to allow of the introduction of a scoop, forceps, or such other instruments as may be required, and to facilitate the removal of the offending body when found.* If, however, no foreign substance can be found, the sinus must be injected with some stimulating lotion (sulphate of zinc, or alum, or permanganate of potash) daily, until the secretion becomes healthy in character and insignificant in quantity. The aperture, if made through the socket of a tooth, can be kept open by introducing a soft silver or leaden lachrymal style, and securing the end by means of silver wire wound round the adjacent teeth. Great care must be taken not to allow this plug to slip into the antrum, and in order to avoid this, it is better to employ for the purpose one of the old-fashioned and now disused styles with a button at the end.

The antrum can be best perforated through the socket of a molar by means of a large trocar. Care must be taken in performing this operation to guard the trocar, by two fingers resting on the gums, as, if it slips suddenly into the cavity, its point may strike against the floor of the orbit, and even perforate

* The existence of separate fossæ or recesses within the antrum, formed by the projection of imperfect dissepiments across it, will sometimes prevent the probe or finger reaching a foreign substance, if the latter happen to be lodged behind one of these partitions. Hence a curved scoop is very useful for the purpose of exploring the interior, and by hooking it round any projecting bony plates or columns that present themselves, the foreign body can be easily extracted.

it. Mr. S. J. A. Salter has seen this accident happen, but, fortunately without any bad results.

It has been proposed by Lamorier to make the opening below the malar process, but there is the obvious objection that this is not the most depending part of the sinus, and, consequently, not the part most favourable for allowing the free escape of the discharge. If, however, it is desirable to open the antrum at some part not in the alveolar border, it would be preferable to do so at the lower part of the canine fossa. In thrusting in a perforator at this point, it must be directed backwards and a little outwards; if it be thrust directly backwards, unless the antrum be much expanded, there is some risk of not penetrating the cavity at all, but going into the nasal fossæ, or, if the antrum be perforated, it would be only entered at the extreme angle, and the perforator might easily pass through this and into the nasal fossæ afterwards.

It sometimes happens that the abscess has burst, and a fistulous opening has formed which does not readily close, either on the cheek below the orbit, or in some equally inconvenient position, and it is then necessary, in order to allow of the escape of discharge, to make a second opening. It is decidedly objectionable to enlarge a fistulous opening on the cheek, partly because of the disfiguring scar that will be thereby produced, and partly because a more depending opening will be more likely to give free exit to the discharge; hence, in this case also, it is better to perforate the alveolar ridge through a tooth socket.

In a case in which there is so much swelling of the parts that the jaw cannot be opened sufficiently to allow of extracting teeth or of perforating the alveolus, it will be better to perforate in the canine fossæ. This will be sufficient to give temporary relief, and, after the acute symptoms have subsided, the patient will be able to open the jaws without difficulty, and it will then be easy to perforate through a tooth socket at a later stage.

A very ingenious plan was adopted by Bertrandi in a case of fistulous opening on the cheek. He passed a long and narrow

perforator through the fistulous opening, and carried it perpendicularly downwards till he felt the floor of the antrum. He then thrust the point through the alveolar ridge between the two last molars. After this operation the discharge ceased from the fistulous opening and came entirely through the new aperture, and the patient got well.

For cases illustrating the treatment of abscess in the antrum, see Appendix, Cases XXXVIII and XXXIX.

In the case of *syphilitic ulcers* invading the antrum, constitutional treatment appropriate to the particular case will be of more importance than local interference.

In a case under the care of Mr. Gay, at the Great Northern Hospital, a large erosive ulcer of the cheek, probably of syphilitic origin, in a woman of about 40 years of age, had laid open the nasal fossæ and the antrum. It healed rapidly under treatment by large doses of iodide of potassium, the patient taking 90 grains in the 24 hours for several weeks together.

Bordenave (Mémoires de l'Académie de Chirurgie, t. xiii., p. 53; édit. in 12mo.) saw a man whose facial bones were swollen and carious by a venereal disease. The antrum was exposed at its upper and outer part, and its interior suppurating. In spite of the unfavourable situation of the aperture, and without any local treatment, mercurial inunction sufficed to bring about a complete cure.

Subsection 4.—*Cysts.*

Solitary cysts occurring in this cavity have most frequently been found to be dentigerous, *i.e.*, a misplaced tooth-sac has found its way, through the alveolar ridge, into the cavity of the antrum, and has there developed into a cyst in the process of growth.

With regard to the dentigerous cysts, it has been proved by Mr. James Salter ("On the impaction of permanent teeth in the substance of the maxillary bones," by S. J. A. Salter, in Guy's Hospital Reports, vol. v. 3rd series) that "the cysts only arise when the tooth or teeth associated with them are embedded in

the jaw-bone; they do not occur after the tooth has pierced the gum. The embedding of a tooth in the bone does not necessarily give rise to serous collections, for that is by no means an uncommon occurrence, whereas dentigerous cysts are rare. There appear to be three circumstances which may either of them produce impaction of a tooth in the substance of the maxillary bones: the tooth may be originally developed too deep in the body of the jaw; or it may grow obliquely, and so fail to reach the alveolar margin; or again the position of the tooth may be normal, but from some arrest of development of the fang it may fail to reach the alveolar edge and so remain permanently embedded in the jaw."

Hence it is generally the permanent teeth that give rise to dentigerous cysts, and therefore, in a case of cystic distension of the antrum, the presence of a temporary, in the position of a permanent, tooth, at a period when the complete set should have taken their places in the row of permanent teeth, will afford strong presumptive evidence that the mischief is due to the impaction of its successor in the body of the jaw. The absence of a tooth that should be normally present, will afford similar evidence, for under these circumstances the temporary tooth will have been shed at the usual period, and, its successor not appearing, there is every reason for supposing that it has been arrested in its progress to the alveolar border by one of the causes above alluded to.

A consideration of these curious and valuable deductions from observed cases will aid materially in forming a diagnosis in any given case of distension of the antrum by collections of a fluid nature, and will also assist us in directing the treatment of particular cases.

In one or two cases, cysts have appeared to originate by the conversion of old abscesses, connected with decayed teeth, into cystic growths. This appears to be the case in a specimen (see Plate III., fig. 5) in St. Thomas' Hospital Museum. A decayed molar lies immediately below the cyst in the antrum, and the cyst itself appears to be adherent to the fang of the tooth. The

same was found to be the case with the larger cyst represented in fig. 3, Plate III., the cyst being attached opposite a decayed first molar. In these cases the progress of the growth of the cyst is slow, and, especially in the last-named variety, little trouble is likely to be caused by their presence, which may only be discovered after death.

A case illustrating the formation of this kind of cyst is related in the *Dental Cosmos*, by Dr. Chase, of Iowa City, U.S. This gentleman, on drawing a molar tooth, was surprised to find that he had brought away with it "a large quantity of alveolar substance, the bicuspid root, and a fibrous connective tissue tumour, nearly an inch in diameter, attached to the tooth, and enclosing two of the roots." (See woodcut and notes of the case in Dr. Garretson's work "On the Mouth, Jaws," &c., p. 351.)

"The pathology of the case, as inferred by Dr. Chase, is that the tooth decayed to the pulp cavity; that the pulp, after repeated inflammatory attacks, died. Putrefaction of that organ occurred, provoking periodontitis; after awhile suppuration occurred, and the disease became chronic. The periodonteum became thickened and spongy, continued irritation caused a proliferation of connective tissue corpuscles, thus eventuating, finally, in the formation of the cyst." (See Case XL in the Appendix.)

Dr. Garretson (op. cit., p. 350) states that he himself "removed a cyst from the antrum of a young man, and that it seemed to spring from the root of the second molar tooth, or its immediate neighbourhood; the mucous membrane had been dissected up and covered the cyst as a reflex tunic."

In all these cases, however, there was no external evidence of cystic growth, such as enlargement of the bony walls of the antrum, or obstruction in the nostrils, but they have very great interest in a pathological point of view, and indicate the possible origin of some of these cases of distension of the antrum with fluid.

There is, however, another form of cystic growth, described by Virchow as vesicular polypus, which, from the tendency which all polypi have to increase in bulk, is probably in some cases the commencement of those enlargements of the antrum that are generally described as dropsy, a designation, by the way, altogether inappropriate, implying, as it does, a false notion of its pathological significance and etiology. They are thus described by the author above-named :—

"There is no mucous membrane which cannot, according to circumstances, produce follicular cysts and polypi, and it would occupy much space to pass in review all these particular cases. Therefore, I shall confine myself to mentioning the places where the development of these tumours assumes a particular character, or where it becomes of serious importance. This is the case in the *antrum of Highmore*, where these products are relatively frequent and assume all the forms which we see in the uterus in affections of the follicles of Naboth. We find then, in the wall of the maxillary sinus, vesicles sometimes solitary, sometimes multiple, which are filled with a clear or opaque mucus, or with a purulent or epithelial mass. These vesicles spring up by degrees from the surface, take on the form of molluscous growths and polypi, and these polypi become at last so large as to fill up the whole of the cavity. These large vesicles have not ordinarily such thick contents; the mucus softens and forms a thinner and more watery liquid. If the morbid product increases more and more, the sinus can sometimes no longer hold it, and dilatation thereof results, accompanied by atrophy of the bone. This condition appears to be that one which has often been described as *hydropsy of the sinus;* at least, there is no observation showing that *free hydropsy* could attain, in the antrum, to such a development, and I consider as probable, that which M. Giraldes has been the first to note, that a mistake has usually been made as to the origin of these cysts. At the time that the polypus has become so largely developed, it is possible, on opening the sinus, to reach immediately the cavity of the polypus, without perceiving that the liquid was contained in a special envelope,

exactly as when one cuts into the sac of an echinococcus the vesicle of the animal is at the same time incised."*

Examples of the so-called dropsy of the antrum are recorded by Fauchard,† L. H. Runge,§ Bordenave,‡ M. Sauvé,‖ Jourdain, M. Deschamps fils,¶ Boyer, Dubois (in Boyer's "Maladies Chirurgicales," tom. v. p. 105 et seq.). (See translation, Case XXXVIII in Appendix), Sir W. Fergusson (*Lancet*, June 29th, 1850), and by Sir John Fife (*Lancet*, 1850, vol. ii, p. 343). (See Case XLI. in the Appendix).

Mucous Cysts.—M. Giraldès, of Paris, seems to have first pointed out that the so-called *dropsy of the antrum* is often only the result of the formation of a large single cyst or multiple cyst, and that the seat of the disease was, in such instances, in the mucous glands of the lining membrane of this cavity. These glands lie in great numbers, especially along the inner wall of this sinus, and when, from any cause, the orifice of the glandular canal becomes obliterated, the secretion is retained, collects and forms a cyst. M. Giraldes divides these cysts into two kinds:—1. The miliary cysts, formed by the dilatation of the peripheral part of the excretory duct. 2. Cysts of a larger bulk, and formed by the dilatation of the whole follicle. The first kind are only of importance as being occasionally the starting point of the larger cysts. These latter, of which specimens are seen in St. Thomas' Hospital Museum (see Plate III, figs. 3 and 4), placed there by Mr. William Adams, even before the treatise of M. Giraldès called attention to their significance, are variable in number, sometimes single, sometimes multiple.

In the specimen figured in Plate III, fig. 6, the "lining mem-

* Virchow, "Die krankhaften Geschwülste," vol. i, p. 245.

† "Le Chirurgien Dentiste," Paris, 1728, tom. i, p. 438.

‡ "Dissert. Med. Chirurg. de morbis præcipuis sinuum ossis frontis et maxillæ superioris, preside F. de Fiegler Kintelu," 1750.

§ "Memoires de l'Academie Royale de Chirurgie," tom. iv, p. 336, and tom. v, p. 227.

‖ "Bulletin de la Faculté de Médecine et de la Société, etablie dans son sein," tom. v, p. 9.

¶ "Dissertation Inaugurale," par M. Deschamps, fils.

brane of the antrum at the base of the cyst is slightly thickened, but healthy in other parts, excepting that, at a little posterior to the above-described cyst, it appears to be split into two layers, which are separated from each other, the outer layer having a central perforation, presenting therefore somewhat the appearance of a cyst with a central aperture." ("Catalogue of St. Thomas's Hospital Museum," p. 194; description of specimen, I, 22.)

In the next specimen (I, 23 in the Catalogue), a somewhat similar condition of the posterior part of the lining membrane of the antrum is described; it "is seen to be split into two layers at two places, the layers being separated to the extent of one-eighth of an inch, and connected by loose but abundant areolar tissue." This description answers very closely to the appearance of the cysts such as those in Plate III, fig. 1 and fig. 2.

On Plate III, figs. 1 and 2, are two illustrations representing cysts in the antrum taken from M. Giraldès' paper on this subject. They well exhibit the multiple form of cyst in an early stage of development.

Their size varies from that of a large pea to that of a pigeon's egg, and even larger. Their colour is not uniform: sometimes transparent, of a whitish yellow, sometimes opaque, yellowish at the centre, and transparent at their circumference. The matter contained in them is generally viscid, thick, stringy, transparent, and sometimes yellowish. In some instances it is a thick opaque mass, occupying the central region of the tumour. In the larger cysts the matter seems to have undergone a certain amount of alteration; it is more liquid, of a yellowish-white, sometimes but slightly transparent, of a syrupy consistence, and loaded with crystals of cholesterine. The matter from these cysts dries up rapidly when exposed to the air, and then assumes the appearance of gum arabic. Chemically, it contains much the same constituents as mucus, but with a little more albumen. Microscopically, it contains granules, altered blood globules, fat globules, débris of epithelium, but, above all, a large quantity of crystals of cholesterine.

Symptoms and Progress.—As the cysts increase in bulk they

Plate III.

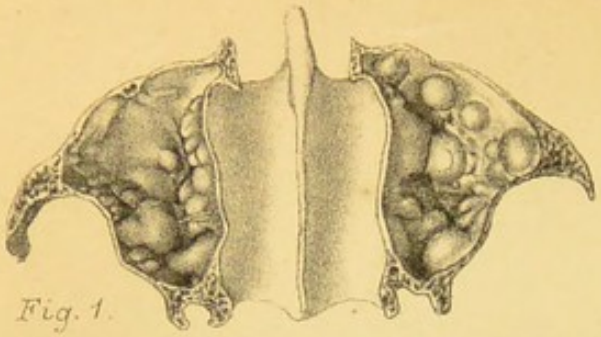


Fig. 1.

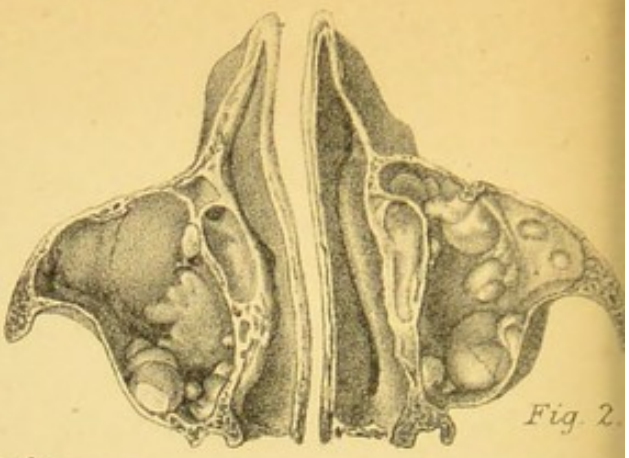


Fig. 2.

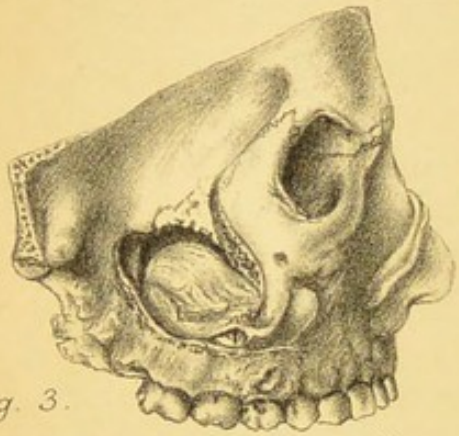


Fig. 3.

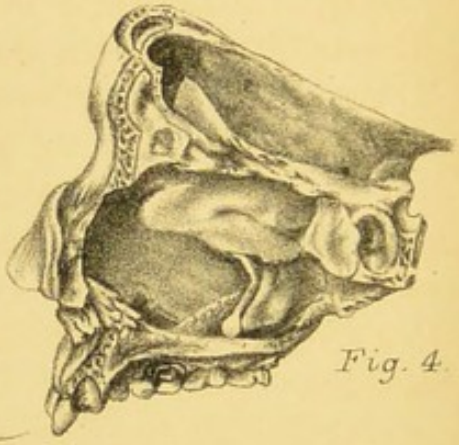


Fig. 4.

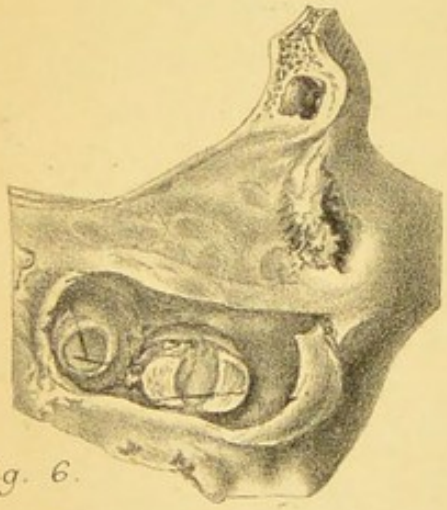


Fig. 6.

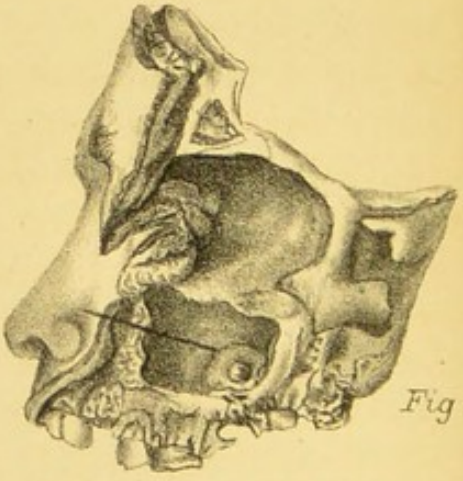


Fig. 5.

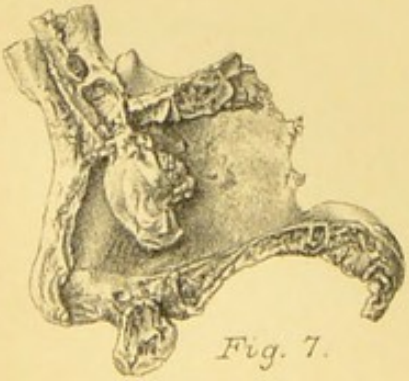


Fig. 7.

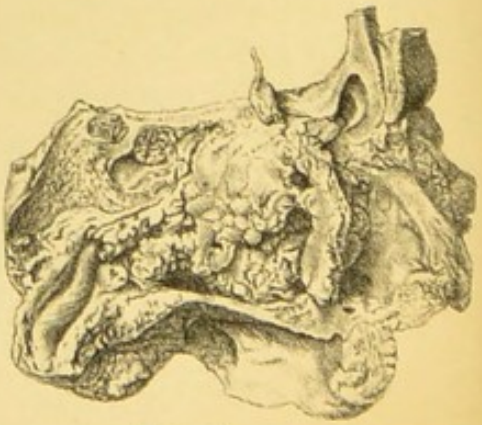


Fig. 8.

W. West & Co. imp.

Description of Plate III.

Figs. 1 and 2, Sections of the upper jaw with cysts in the antra (from Giraldès' Treatise "sur des Kystes Muqueux des Sinus Maxillaire").

Fig. 3. A specimen of cyst in the antrum, in St. Thomas' Hospital Museum. In the same specimen there is a polypus of the nasal fossa. The lining membrane of the antrum is slightly thickened at the point of attachment of the cyst. The first molar tooth is decayed in the fang opposite the attached parts of the cyst; the other teeth are all healthy; the fang of the carious tooth is exposed on the alveolar ridge externally, showing that ostitis and subsequent absorption of bone tissue have been going on.

Fig. 4. The opposite side of the specimen represented in fig. 3, to show the polypus (much shrunk by the long immersion in spirit) attached below the orifice of the antrum in the middle meatus.

Fig. 5. An imperfect cyst in the antrum, with a carious molar tooth immediately beneath it (from a specimen in St. Thomas' Hospital Museum).

Fig. 6. Simple serous cysts of the antrum. The mucous membrane of the nose appears to have heen inflamed (from a specimen in St. Thomas' Hospital Museum).

Fig. 7. A specimen in King's College Anatomical Museum (marked 811. 10) showing a gelatinous polypus hanging from the frontal sinus, taken from an old woman.

Fig. 8. A specimen of medullary disease of the nasal cavities and adjacent parts, from King's College Anatomical Museum (marked 811).

fill, and ultimately distend the cavity occupied by them, and thrust the walls of the antrum towards the cheek, the orbit, the nostrils, or the mouth, and sometimes in all these directions at the same time, causing thereby great facial deformity and displacement of the neighbouring organs. The walls become thin and fibrous in consistence, so that when pressure is made on the cheek a crackling sensation, as if from the yielding of parchment, is experienced. In all respects, therefore, the symptoms resemble those of so-called dropsy of the antrum.

Diagnosis of Cysts.—The same external distortion and enlargement of the jaw occurs in the advanced stages, as in distension of the walls of the antrum from any other cause, and in the early period these features will be altogether absent. An exploratory incision in the most prominent part of the swelling, through the mucous membrane, will not fail to clear up any doubt as to the presence or absence of fluid and as to its nature, but it may not quite satisfy us as to its position, unless care be taken to explore the cavity with a probe after letting off its fluid contents; for it is not very uncommon to meet with cystic growths in the mouth quite external to the walls of the antrum, and it would not be satisfactory to conclude, from the mere presence of fluid in such a cyst, that we were therefore dealing with an antral cyst. Sir James Paget describes a case, occurring in a woman, of a soft elastic swelling, which pushed out the thin mucous membrane of the upper jaw, producing externally an appearance somewhat similar, at first sight, to distension of the antrum. An incision into the cyst allowed the escape of nearly an ounce of turbid brownish fluid, containing crystals of cholesterine. Sir James then found that "the cyst rested in a deep excavation on the surface of the alveolar border of the upper jaw; an adaptation of shape attained as the result of long-continued pressure of the cyst, which had existed six years."

Treatment.—A puncture should be made in the most prominent part of the cyst wall, and, after removal of the contained fluid, the aperture sufficiently enlarged to allow of the whole cystic growths being scraped away from their attachments. The

opening must be made, if possible, within the mouth, in order to avoid a disfiguring scar on the cheek, and also because the cavity of the antrum can be better reached at this part, about half-an-inch above the second molar tooth, or at the most prominent part of the tumour near that point. If, however, there is a carious molar that requires removal, it should be extracted, and the antrum can then be perforated through the socket. In whichever way an opening is made, it should be sufficiently large to allow of the introduction of some instrument, such as a gouge, for the purpose of extracting the cystic contents. If the opening be made in the outer wall, a portion of the bone should be removed by means of cutting pliers.

The sinus being opened widely and emptied of its contents, it may be syringed out daily with some stimulating injection, such as iodine solution, or sulphate of zinc, and the aperture kept open by being stuffed with lint soaked in carbolized oil.

A still better method of making a large orifice in the wall of the antrum is that suggested by Dr. Weber, viz., to cut the bony wall in the form of a trap-door, leaving the upper part of the flap united by the periosteum, as a sort of hinge. This allows of a sufficient opening, and the vitality of the bone will be preserved, so that when it is thought desirable to close the orifice, the bone can be restored to its normal position, and no permanent aperture will be left. If the walls of the sinus have become much attenuated before treatment is commenced, it is possible that a seton may be passed through the expanded and softened portions, and allowed to remain until suppuration has become established; but this method is open to the objection that we cannot judge of the exact nature of the cyst, unless we have a considerable opening, through which the probe or finger can be passed; and considering the very frequent occurrence of some irritating foreign body or loose tooth in connection with these enlargements of the antrum, considering also the fact that the cyst, if multiple or if formed of a tough membrane, should be removed in order to prevent its refilling, it is much better in all cases to make a larger opening than could be done by the use of

the seton thread only. It is rarely necessary to make any incisions through the integuments, in order to reach the expanded walls of the antrun; and this is only justifiable when the cystic growth is partly solid. It is probable that in Sir John Fife's case (Case XII in the Appendix) the incisions were made through the integuments in the expectation of meeting with a solid growth, though it was afterwards found that the only contents of the antrum were "two teeth and about four ounces of gelatinous amber-coloured fluid." The case is instructive, as illustrating the desirability of making preliminary or exploratory incisions into the growth within the mouth before proceeding to make large incisions through the skin.

Erectile or Cavernous Tumours.—Intermediate between the cystic or fluid expansions of the antrum and the solid tumours, may be placed the cavernous or varicose tumours, of which, however, I can only find two examples recorded: one is found in M. Josh. Gensoul's "Lettre Chirurgicale sur des Maladies Graves des sinus Maxillaire," p. 28. (See Case XLII in the Appendix.)

The compressibility or spongy feeling of the tumour through the attenuated wall of the sinus must have given the surgeon a suspicion of its true nature, though in the narrative of the case no mention is made of the diagnosis. The treatment by removal of the upper jaw was certainly justifiable in this case, the antrum being quite full of the cavernous tissue.

It is possible that at an early stage the actual cautery would be equally efficacious in a similar case, and for a convenient form of cautery for this purpose, I may refer to a case reported in the "Clinical Society's Transactions," with a drawing of the instrument employed* (fig. 14).

The second case is cited from the practice of Mr. Liston, in the *Lancet* of October 9th, 1841, and October 26th, 1844. It was taken from a young man of twenty-one years of age; had been growing for three years; projected into the nares and

* "Transactions of the Clinical Society of London," vol. vi, p. 166. "A Nævus of the Orbitar Cellular Tissue treated by Ligature and the actual Cautery," by W. Spencer Watson.

pharynx and formed a tumour on the cheek. It did not involve the alveolar border nor the lower and anterior part of the jaw,

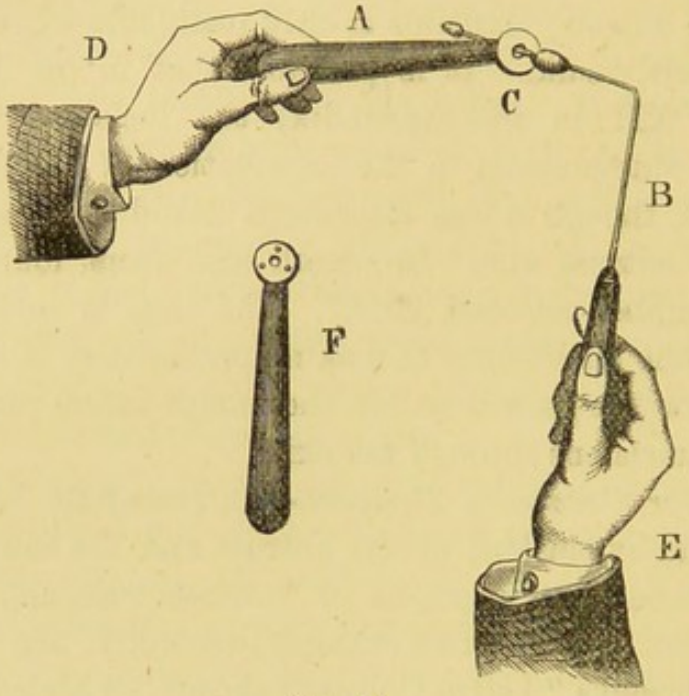


Fig. 14.

and consisted entirely of erectile tissue, though it at first sight looked like a fibrous tumour.

Subsection 5.—*Solid Tumours of the Antrum.*

Dentigerous cysts occasionally undergo changes of various kinds, so that, from being originally bags of fluid with the tooth attached to the wall and lying partly within the cavity, they may, at a very advanced stage, come to resemble solid tumours. Mr. Samuel Cartwright possesses a preparation (a representation of which from Mr. Cattlin's Paper on the antrum will be found in Plate IV fig. 1) of a bony cyst occupying an expanded antrum attached to its floor, but unconnected with it elsewhere. The cyst contains in its interior a supernumerary tooth, lying loose in its cavity. In such a case as this the diagnosis would have been very difficult, and the cystic origin of the tumour could not have been ascertained previous to an operation. The growth would have been stationary for a considerable time, and therefore no interference will be thought desirable.

Polypi in the antrum are very uncommon in the mucous or gelatinous form, but epuloid or fibrous or sarcomatous tumours have often been classed as fungus or malignant polypus, when met with in this cavity.

The case of vesicular polypus described by Virchow ("Die krankhaften Geschwülste," vol. i, p. 245) does not belong to the same class as the mucous or gelatinous polypi of the nasal fossæ; it is rather related to the mucous cysts mentioned in a former page as occurring in the antrum, and being the first stage of the so-called dropsy. The cystic or vesicular polypi, described by Mr. Cæsar Hawkins ("Contributions to Surgery and Pathology," vol. i, p. 233) as occurring in the nasal fossæ generally, are no doubt of the same kind, and all are similar in origin to the mucous cysts met with in the lips and inside of the cheeks. None of them appear to have much clinical interest, and they are only pathologically important as being the possible origin or starting-point of more serious disease. Luschka has found these cystic polypi or mucous cysts in the antrum in five out of sixty subjects examined. (Luschka, "Ueber Schleimpolypen der Oberkieferhöhlen," Virchow's Archiv. 1855, viii, p. 423.)

The ordinary gelatinous polypus in the nasal fossæ may occasionally grow to such a size that it causes absorption of the inner wall of the antrum, and then partially occupies it, but the more common course is for the polypus to push the antral wall before it, contracting its cavity, but leaving it still intact as a separate sinus.

Of polypi originating in the antrum an example has been already mentioned (see Subsection 3, on "Abscess of Antrum") (Case XXXI in the Appendix). The presence of the polypi in this instance was not suspected, until they made their escape, in a decomposed condition, through the posterior nares into the pharynx and were expelled through the mouth. The sinuses closed up, and the purulent discharge, that had been so long troublesome, now ceased; it was evident that the suppuration had been due to the presence of the polypi, and that the inner wall of the antrum had become absorbed, or had suddenly given

way, from ulceration and internal pressure combined. The exact nature of the polypi in this case could not be ascertained because they were decomposed, and microscopic examination failed to throw any light on their structure. But it is most likely that they resembled the mucous cysts and vesicular polypi, rather than the gelatinous form; and the fact that there was no history of any polypi in the nasal fossæ associated with the disease in the antrum, makes it more likely that this was the true explanation of the case. Sir James Paget is of opinion that the "soft polypi that grow, very rarely, in the antrum" are just like the mucous, gelatinous, or vesicular polypi that are commonly met with in the nostrils.

The various *solid tumours* that affect the upper jaw, when they grow to any considerable size, very commonly invade the antrum, or encroach upon its cavity by compressing its walls in various directions. There are, however, very few cases in which it can be said that the disease is essentially a disease of the antral cavity, as having commenced within it, though, regarded clinically, it is often convenient to classify growths as coming from the antrum, which have, as a matter of fact, only secondarily invaded it.

Sarcomatous and *epulo-fibroid* growths often penetrate the alveolar ridge and grow into the cavity of the upper jaw, and the disease then becomes more important as regards the whole jaw than as affecting one of the accessory cavities of the nasal fossæ.

Mr. Carr Jackson recently operated on a case of this kind, at the Great Northern Hospital, in which, after removing a portion of the antrum involved in the growth, he found a tooth lying loose in the cavity. This complication had no doubt arisen from the disease having sprung from the socket of the tooth, and from the latter having been carried upwards in the diseased growth and at last separated from it by ulceration or necrosis.

There is a remarkable preparation of a *villous fibroid growth* in the antrum, in the College of Surgeons' Museum. This

specimen was taken from a patient operated on by Mr. Christopher Heath, who, in his work on diseases of the jaws, gives the particulars of the case. The interior of the antrum was covered with a remarkable papillary or villous growth, resembling some forms of cauliflower excrescence; a quantity of broken-down loose fibroid tissue lies at the bottom of the bottle containing the preparation. The rest of the tumour consisted of polypoid growths. (See Case XLIII in Appendix.)

The late Mr. Bruce's report on the above specimen is as follows:—"It appears to consist of a fine soft fibrous stroma, in which very numerous nuclear bodies and a few elongated fibre-cells are distributed. Its structure resembles that of the upper strata of a mucous membrane, from which it is probably an outgrowth. It consists of newly-formed fibrous tissue and of the elements from which fibrous tissue is developed, and may, therefore, be classed among the simple fibro-plastic growths as distinguished from the true myeloid tumours."

The remarkable and unusual points in the above specimen are that this form of polypus should have originated, as it appears to have done, within the antrum, and that it presented, besides the ordinary pedunculated form of polypi, the soft fleshy villosities on some portions of its surface. It must be regarded as an unique specimen.

Fibrous, fibro-sarcomatous, and *osteo-sarcomatous* tumours also invade the antrum from the neighbouring bones or cavities, though it is not often that the tumour actually springs from within it. But a specimen in St. George's Hospital Museum is described as "Fibrous tumour growing from the antrum, and making its way by the absorption of the walls of that cavity in different directions. It projects upwards into the orbit, destroying the floor of that cavity, and protruding from its inner margin forwards on to the cheek. It has also destroyed the anterior wall of the antrum, and displaced the malar bone forward and outward; inwards it projects into the nose beneath the middle turbinated bone, and downwards it makes its appearance on the under surface of the alveolar process in the form of a rounded

mass, destroying the floor of the antrum in the neighbourhood of the front molar tooth. Behind, the tumour appears in the zygomatic fossa by the absorption of the outer part of the tuberosity of the superior maxillary bone. The tumour is composed of circular nuclei of various sizes, and spindle-shaped fibres. The patient from whom the specimen was taken, William H——, died of arachnitis and softening of the corresponding part of the brain." Catalogue of St. George's Hospital Museum, vol. ii, p. 160.

A similar specimen is seen in the College of Surgeons' Museum, 1850.

M. Demarquay had a case (reported in the *Edinburgh Medical Review*, Oct. 1867) of fibrous tumour occupying the antrum of a man æt. 53 years, in whom it had existed for 20 years. When removed, it was found to be lying quite loose in the antrum, and had set up suppuration around it (see Case XXXII in Appendix). It had evidently become detached, in consequence of necrosis, due to pressure on its nutrient vessels resulting from its own growth.

Recurrent fibroid tumours and cases of *medullary sarcoma* are generally associated with some disease primarily in the body of the jawbone or in the alveolar ridge, though the symptoms may afterwards be developed towards the nasal cavities. It is, therefore, important to note the chief clinical features in these cases as an aid to diagnosis.

The distinction between the fibroid polypi, or tumours in the upper jaw simulating polypi, and the gelatinous polypi, is not always a distinction of kind. It may be one only of development. Tumours which, in their early stages, have all the characteristics of the gelatinous form, may, when recurrent, after several operations for their removal, become much more fleshy and firm in consistence, and, when examined microscopically, have all the structural peculiarities of sarcoma.* But the very firm fibrous tumours and the osteo-sarcomata will

* Mr. Cæsar Hawkins is of opinion that the distinction between the fibrous polypi and the gelatinous forms, depends upon the seat of the tumour, that when

generally retain their original characters from first to last There is no essential malignancy about these growths, that is to say, they have no tendency to contaminate and involve the neighbouring structures in their own form of growth, and they do not spread to the adjacent lymphatic glands, nor are they reproduced in distant organs of the body. But the aspect of the patient is often very much like that of one affected with malignant disease, and, as the tumour penetrates the bones, and ultimately the integuments, and causes fistulous openings on the cheek with fungous protrusions, with a foul-smelling discharge and sometimes a bleeding surface, the appearance of the disease is very much the same as that of medullary disease, and if the tumour has not been removed before this stage has been reached, there is every probability of a fatal issue. Death is generally preceded by great wasting and anæmia, and pressure upon the base of the brain is usually announced by convulsions and coma. Sometimes the system seems to be infected by the absorption of foul discharges, and the patient dies of a form of septicæmia.

There is good reason for believing that some sarcomatous tumours, or, as they are sometimes called, fungus of the jaw, degenerate into true cancers. This may be due to spontaneous changes, such as are observed in adenomatous growths in other parts, or possibly to the irritation of external applications or caustics. The tumour then becomes the seat of severe lancinating pains: there is frequent epistaxis; the presenting part is softened, and projects in a fungous form, and an ichorous discharge escapes from the fistulous openings in the cheek, or by the side of the gums, or in the palatine vault. The bones are softened and destroyed rapidly, and febrile excitement becomes more and more developed, until the patient becomes ex-

it springs from a part of the nasal fossæ in which the fibrous tissues are predominant, the resulting tumour is fibrous; but that if the mucous tissue is the part affected, the gelatinous polypus is the result of the morbid process; and further, that a simple gelatinous polypus may in time become fibrous in consequence of its growth extending to the sub-mucous tissue.

hausted by the pain and discharges, and dies miserably. If, however, a degenerated fibroid tumour of this kind is operated on before the lymphatic glands in the neck have become affected, there is every prospect of arresting the disease and saving the patient's life. In a case treated by Mr. Lawson, by excision of the tumour and subsequent application of caustics, the result was excellent, and most encouraging as to the possible results of cases ordinarily most unpromising ("Clinical Society's Transactions," vol. vi, p. 20, and Case XLVIII in the Appendix).

Myeloid tumours are found in this cavity (see Paget's "Surgical Pathology," vol. ii, p. 219, and Case LVI in the Appendix), and two cases of Mr. Canton's are recorded by Mr. Christopher Heath (one from the "Pathological Transactions," vol. xvii).

Osseous growths have often been met with occupying the antrum, and one of the most remarkable was a case of Mr. Hilton's ("Guy's Hospital Reports," vol. i): a large, ivory-like mass, occupying the whole of the upper jaw, sloughed away and fell out spontaneously.

Several other instances of large ivory-like growths of the upper part of the face have ultimately invaded the antrum, as well as all the surrounding cavities (see "Pathological Transactions," vol. xix, p. 310 et seq.).

It is thought by Sir James Paget better not to attempt the removal of these growths by operation with instruments, as it is so very difficult to ascertain exactly the depth to which they extend, and as some of them have been found to extend deeply into the cranial cavity, great caution is required in dealing with them. Sir James Paget would prefer to imitate the operations of nature, as exemplified in Mr. Hilton's case, and to apply caustics to the exposed surface of the tumour, with the view of exciting a sloughing action and spontaneous detachment of at least a part of the growth. With these views I am inclined to think most surgeons of experience will agree.

As to the cancellous form of osseous growths invading the antrum from the ascending process of the superior maxillary

bone, of which Sir James Paget has given two examples ("Lectures on Surgical Pathology," vol. ii, pp. 241 and 242), there seems no reason why an attempt should not be made to extirpate the tumours which, in these cases, originate in the upper maxilla.

Hyperostosis of all the bones of the face sometimes invade the antra and obliterate them. Specimens of the kind are found in the College of Surgeons' Museum, and in that of St. Thomas and St. Bartholomew's Hospitals. In the museum of St. Thomas' there is a specially remarkable specimen of this disease, marked "C 195." It is "the skull of a fisherwoman, long remarkable even at Billingsgate for her hideous appearance. Two large swellings had been formed under the orbits in the fore parts of the cheeks, between which the nose appeared wedged, and the nostrils were closed. Each eye projected considerably from its socket. This person was seized with a fit which seemed to be of an apoplectic nature, and in that state was brought into St. Thomas' Hospital, where she almost immediately died" ("Surgical Essays" by Cooper and Travers, part i, p. 171). The specimen shows, in connection with each superior maxilla, a rounded bony growth, extending from the lower margin of the orbit to the roots of the alveolar processes. Each mass projects considerably into the floor of the orbit, diminishing materially the size of its cavity. The left orbit is also encroached on by an additional growth that projects downwards and outwards from the orbitar plate of the frontal bone. On removing the skull-cap, the increased density and thickness of the frontal bone may be seen; this, however, is most marked on the right side, and seems to have occurred principally on the internal table; a cup-shaped growth may also be seen projecting into the cavity of the cranium from the left orbitar plate of the frontal bone. The various sections that have been made through the specimen show that the cavity of each antrum is occupied by the growth, which, by its projection inwards, has also encroached upon the nasal fossæ. The frontal and ethmoidal sinuses are filled with a similar deposit. ("Catalogue of St. Thomas' Hospital Museum," vol. ii, p. 84).

The extensive and almost symmetrical growth of these enlargements of the bones seems to point to some constitutional origin of the disease, but the exact nature of this is not known. They seem to be related to a disease affecting the bones of the face generally, to which Virchow has given the name of leontiasis ossea, and which seems to have some pathological relationship to elephantiasis (see Virchow, "Krankhaften Geschwülste," Band ii, p. 23), the chief points of resemblance between the two diseases being the intermittent attacks of a kind of erysipelas. This peculiarity in a case of hyperostosis was well marked in the Case XLIV in the Appendix.

In St. Bartholomew's Hospital Museum (Series I, p. 62) is a specimen of hyperostosis of the bones of the face, filling up both the antra. In sections through the sinuses, their cavities are represented by spaces of the size of a cob-nut in one, and not so large as a pea in the other. This indicates, as the disease of the adjacent bones does also, that their obliteration is in consequence, not of the growth of tumours into them, but of the thickening of their walls. The new bone by which they are increased in thickness is hard, nearly solid, and heavy; it is almost all formed on their inner surfaces; only a few small similar growths are elevated on their outer surfaces, and project on the face and into one of the orbits. The septum nasi and spongy bones are similarly enlarged, thickened, and very dense in their texture. Two cases of hyperostosis, illustrating the pathology of this fearful disease, are given in the Appendix (see Cases XLIV and XLV.

Osteosarcoma, or osseous tumours with fibroid tissue mingled with the bone, are sometimes met with in the antrum, witness a case under the care of the late Mr. Solly, the specimen from which is in St. Thomas' Hospital Museum. (Section I, 18, in "St. Thomas' Hospital Museum Catalogue.") It is thus described in the catalogue: "An osteo-fibrous tumour, removed by Mr. Solly. The tumour entirely filled the cavity of the antrum, the bony parietes of which have been absorbed to a considerable extent; it protruded the cheek anteriorly, projected into the

fauces posteriorly, pressed down the palate inferiorly, and extended to the septum nasi internally. Its firmest point of attachment is to that part of the antrum corresponding to the roots of the first molar, canine and incisor teeth. The tumour is of a rounded form, and has a smooth external surface; its section presents very much the appearance of a fibrous tumour of the uterus of slow growth, and contains an abundance of bony deposit. It was removed from a boy, æt. 17 years. The existence of the tumour was discovered only ten months previous to its removal, when the face began to swell, the swelling being accompanied by pain. No untoward circumstances followed the operation, and the boy left the hospital quite well. The deformity was very slight. Five years after the operation the boy was in capital health."

The diagnosis of a solid tumour in the antrum, requires to be directed to two principal points:—(1.) As to its nature. (2.) As to its position.

The symptoms indicative of a slowly growing tumour within the antrum, are much the same as those resulting from fluid collections in the same cavity, up to a certain point. There is the same gradual distension of the bony walls, the visible and tangible enlargement on the cheek, the distortion of the features and displacement of the neighbouring parts, and ultimately the softening and ulceration of the skin. But the opening on the surface once made, either by the unaided efforts of the pathological processes, or by an incision into the prominent part of the growth, there is then, in the case of the solid growth, no escape of purulent or other fluid, and on passing a probe into the orifice, the growth is found to be solid and resistant. An early exploratory puncture with a fine trocar is therefore very necessary in all growths of doubtful nature in this region. The possibility of mistaking an abscess for a solid tumour has been already alluded to in Subsection 3, and it has also been pointed out, that a small circumscribed abscess may coexist with a tumour in this region.

Some idea as to the malignancy of a growth which has been

proved to be solid, may be derived from a microscopic examination of the discharge, or from portions removed in the course of the exploratory punctures or incisions, and its rapidity of growth, fungoid tendencies, &c., will also assist in the same direction.

In the later stages the lymphatic glands in the neck will become enlarged in true carcinoma, and it will be always desirable to examine the glands in this region carefully, whenever a tumour is rapidly increasing in size, and there is reason to suspect it of being malignant. It is rare for true carcinoma to commence in the antrum, but as it is not infrequent in the neighbouring bones, it is almost sure to invade the antrum as it advances.

It is next important to ascertain the anatomical relations of the disease, especially in reference to its seat of implantation. If coming from within the antrum, we shall expect to find the presenting part of the tumour surrounded by a margin of thin irregular plates of bone; or if the disease has not advanced so far as this, to be able to trace the bony walls of the cavity continuously over the expansion of the tumour. There is the obvious difficulty in the case of bony tumours, that their surfaces will be hard and resisting, and therefore so far like the bony walls of the antrum itself; but it is generally noticed that bony growths have a nodulated and rounded or lobulated surface, especially at that part which is most prominent. This consideration will, in most cases, serve to distinguish the bony growths from within the antrum from a distension of its walls; but it is possible that there may be a nodular growth altogether outside the jaw, and compressing the walls of the antrum, and yet presenting some aspects similar to those proceeding from within. Even fibrous growths coming from behind the jaw and winding round it, and presenting on the cheek may deceive, and have deceived surgeons, as to their seat and mode of growth. A remarkable case, related by Mr. Prescott Hewett, in the "Medico-Chirurgical Transactions," vol. xxxiv, p. 43, is a striking illustration of this point in diagnosis (see Case XLVI

in the Appendix). In all cases of supposed tumours within the antrum, it is well to examine the nostrils anteriorly and posteriorly. The fact that a tumour is visible in the anterior nares, and that the nostril is occluded by it, is, to a certain extent, an argument in favour of its coming from the antrum; supposing that there are, at the same time, indications of a distension of the cavity in other directions. The history of a slow growth in the cheek, with a later obstruction in one nostril, is strongly in favour of the same view. The invasion of the pharynx, or obstruction of the posterior nares, is a complication of the later stages of antral growths; but in the earlier stages the growth invades the anterior region of the nostrils, and might be scarcely visible by posterior rhinoscopic examination. The fact of the pharynx being occupied by the growth at an early period, would lead to the inference that the disease is a naso-pharyngeal rather than an antral disease.

Subsection 6.—*The Treatment of Polypi and Solid Tumours in the Antrum.*

Polypi of the antrum presenting in the nostrils, may sometimes be removed through the natural passages by tearing them away from their attachments by means of the polypus forceps. Sir Wm. Fergusson has succeeded in getting rid of a polypus in this way on one occasion ("Practical Surgery," p. 561), after having incompletely removed it in a former operation; but this plan cannot be generally adopted for the removal of tumours from the antrum. It can only be tried with any reasonable prospect of success, when the tumour presents in the nostrils, after having caused by its pressure complete absorption of the inner wall of the antrum, thereby converting its cavity and that of the nostril into one large fossa. Even under these favourable circumstances the tumour could not be brought away entire, unless it had a very narrow and rather fragile base of attachment, and a tolerably firm consistency. If, however, the case is favourable for this plan of operation, it should certainly be tried, and in the event of the aperture of the nostril being too narrow,

more room could be obtained by dividing the ala at its junction with the cheek, or by turning up the soft tissues of the face by Dr. Rouge's plan (see Section IV).

More frequently it is necessary to lay open the front of the antral cavity and remove the growth piecemeal through the aperture thus made, a method of proceeding advocated and acted upon by Sir William Fergusson in some cases, in which it is thought possible to extirpate the whole tumour without removing the surrounding bones of the jaw. Previous to the time of Gensoul, this appears to have been the only method of operating, even when the bones around the sinus were more or less involved, and cases are recorded as having been thus treated by Acoluthus, a physician of Breslau, by Jourdain, Garengeot, Desault, Dupuytren, Beclard and Georgi (see Gensoul's "Lettre Chirurgicale sur quelques Maladies Graves du sinus Maxillaire," p. 5. Paris, 1833). Operations of this kind often had to be repeated at intervals of a few days in consequence of the difficulty of reaching the outer limits of the disease, and the hæmorrhage was often very embarrassing, being kept in check by the use of the actual cautery and subsequent plugging of the cavity. M. Gensoul seems to have been the first* surgeon to perform the operation of resection of the upper jaw for tumours of this cavity, and he was speedily followed by Mr. Lizars of Edinburgh, and by Mr. Scott of the London Hospital.

M. Gensoul's operation was a much more formidable proceeding than the various modifications introduced by more modern surgeons. In order to expose the upper jaw thoroughly the cheek was laid open by four incisions. The first reached from the outer corner of the eye to the upper lip, which was divided opposite the canine tooth. From the middle of this incision, or rather a little nearer the level of the base of the nose,

* Perhaps it would be more correct to say the first surgeon on this side of the Atlantic, for it is stated by Dr. Garretson (op. cit. p. 679) that an American surgeon, Dr. Jameson, made the first complete resection of the upper jaw; this having been done in 1820.

a second was carried to within four lines of the lobe of the ear; a third extended from the end of this to within five or six lines of the external angle of the orbit; and a fourth from the point of union of the second and third incisions to within an inch of the lower border of the lower jaw along the inner margin of the masseter muscle. The jaw being thus exposed, the junction of the malar with the external-angular process of the frontal was divided with the aid of a chisel and mallet, and the chisel was made to penetrate as far as the spheno-maxillary fissure. The zygoma was next cut through, and the chisel was then applied at the inner angle of the orbit, and made to cut through the lower part of the os unguis and the orbitar plate of the ethmoid. The nasal bones, the articulation of the two maxillæ, and the articulation between the jaw and pterygoid process of the sphenoid were divided in a similar way. The soft parts were then cut through with scissors or bistoury, and the tumour thus liberated was removed.

This operation, with some modifications in one or two cases, was performed successfully in four cases at least by M. Gensoul, the tumours being very large and requiring therefore very free incisions for their exposure.

Such an operation performed without the aid of an anæsthetic, must have been as appalling to witness as it was agonising to the patient to endure, and embarrassing to the surgeon to perform.

The use of a chisel and mallet, for the purpose of dividing the bones, appears at first sight to add to the dangers of the operation, but there is no doubt that, in skilful hands, they might be used with perfect safety and with more rapidity than the saw employed by surgeons in the present day. Nowadays, however, rapidity of operating, which, without anæsthetics, was all-important for the successful performance of an operation, has become less so; and the particular operation in question can now be performed at comparative leisure, while the improved methods of operating, and the better choice and adaptation of instruments, together with the employment of anæsthetics, have robbed this formidable proceeding of half its terrors.

Many modern surgeons have succeeded in removing some very large tumours from this region with much more limited incisions through the integuments of the face than those employed by Gensoul, often only removing portions of the upper jaw, but leaving the orbitar plate and sometimes the alveolar ridge intact. Among other improvements in the operation, it has been found that an incision carried through the centre of the upper lip and along the sulcus between the ala of the nose and the cheek up to the inner angle of the orbit, suffices to make a very large flap, and to expose the surface of the jaw completely. In the case of very large tumours, if this flap does not expose the surface sufficiently, a transverse incision along the lower border of the orbit, commencing from the termination of the first incision, gives great additional room, when the flap has been dissected back towards the zygoma.

It is not by any means necessary to remove the floor of the orbit in all cases, and the malar bone, or a great part of it, can generally be left in its position in many cases. The small saw, the curved cutting pliers, and the lion forceps, devised by Sir William Fergusson, afford very great assistance in the performance of these operations.

In the case of tumours of any considerable size, the incisions above described, through the lip and the integuments of the cheek, are absolutely necessary, but in the rare instance of small tumours of the nature of schirrus, and in some epulo-fibroid growths, it is possible to excise the jaw without dividing the lip or making any external incisions whatever. Sir Wm. Fergusson, in the course of some remarks on an operation performed on a young woman with disease affecting the alveolus from the second incisor to the second molar, and extending into the antrum, observed that he had been able to remove the diseased parts without interfering with the lip, and he attributed his success in this instance to the employment of the curved cutting pliers. He first clipped away the alveolar ridge and then attacked the portion of disease situated in the neighbourhood. By this means he freely laid open the antrum and nostril. He alluded to a

case in which Mr. Bowman successfully removed a large tumour from the antrum extending into the mouth, without dividing the lips.

Professor Horner also has removed the upper jaw of the left side without preliminary incisions; and Dr. Garretson has succeeded in doing the same thing in two favourable cases without the slightest difficulty. (Garretson, op. cit. p. 681.)

The operation, as practised by Dr. Horner, is thus described by his son-in-law, Professor Smith: "Having determined to avoid cutting through the cheek, as commonly practised, the patient was seated in a chair, with his head well supported, and partially etherized. The assistant, supporting the patient's head, then raised the angle of the mouth on the left side and held it widely open, while the upper lip and cheek were dissected from the superior maxilla as far back as possible, in a line parallel with the superior margin of the buccinator muscle. The two incisor teeth on the left side being then drawn, the corresponding alveoli were cut through in the middle line by a narrow saw, which worked its way from the mouth into the left nostril; then a pair of strong hawk-bill scissors, such as are used by gardeners for lopping off twigs, took out the two vacated alveoli at a clip. A thin, flat, well-tempered knife, with a strong, round handle, was now struck through the roof of the mouth into the nose, at the junction of the palatine processes of the palate and superior maxillary bones (posterior middle palate suture), so as to cut forward and separate the maxillary bones from each other in the middle, when the narrow saw was again used to cut through the root of the nasal process of the maxillary bone, and strong scissors, curved on the flat, made to cut through the orbitar plate at its margin, the incision being carried back to the pterygoid process of the sphenoid, around and below the malar bone. The base of the soft palate being then detached by a short, triangular knife, curved on the flat, so as to leave the soft palate attached to the palate bone, a few touches of the knife freed the remaining attachments. The pterygoid process, the malar bone, and the orbitar plate of the upper maxillary were not disturbed. The

tumour, which was schirrous, besides its bony connection, was also attached to the posterior part of the cheek and to the external pterygoid muscle. The gouge and scissors, however, sufficed to remove every part that could be detached. The bleeding was profuse, especially from what was believed to be the posterior palatine artery, but the vessel was readily secured by means of a ligature and Physick's needle, and a few other ligatures with *charpie*, arrested the remainder of the hæmorrhage."

A likeness of the patient taken three years after the operation (Garretson, op. cit. Plate XIII, fig. 3) demonstrates the admirable result, the amount of disfigurement being hardly perceptible. However much we may admire the skill displayed by the surgeon in the performance of the operation above described, it is doubtful whether, by abstaining from external incisions, he did not increase the difficulties and dangers to be encountered during its performance; and the greater freedom and rapidity obtainable by the free exposure of the bones, as in the ordinary operation, quite compensates for any slight additional disfigurement that may result from the necessary incisions in the integuments.

A modification of the incisions used for large tumours may be employed for those of intermediate size. The centre of the lip may be divided and the incision carried into one or other nostril, the alar cartilage of which may be separated from its attachments to the upper jaw without dividing the skin, and the flap thus formed will, when turned up, expose the greater part of the upper jaw, and will suffice for the removal of most antral growths.

In a case of disease of both antra, it may be necessary to remove both superior maxillæ. This operation has been successfully performed by Hayfelder and others, and for a description of the operation by the former I may refer to Dr. Garretson's work above quoted (op. cit. p. 685).

Having already alluded to the great similarity in clinical features between simple sarcomatous tumours and malignant or carcinomatous disease in the antrum, and to the tendency of

the former to degenerate into the latter, it is evident that an operation for the removal of tumours in this region is very urgently called for in the early stages, and that when the growth has gone beyond the early stage to that of softening, no operation can reasonably be expected to have much chance of success. When the lymphatic glands in the neck are affected, no operation should be attempted. In all cases, the earlier the disease is removed by a radical operation the better will be the chance of success. Whenever the eyeball is protruded, there is reason to fear that the tumour involves the base of the skull, and operations in such cases are, as a rule, to be avoided; but the fact of the growth being of a malignant character, is not in itself a reason for declining to remove it by operation. Rapidly-growing tumours of a soft medullary kind are the least likely to yield successful results after operation, and, unless seen in the earliest stage, should not be interfered with.

Epitheliomatous disease may be attacked successfully without removing the upper jaw, even after ulceration of the skin has taken place and fungous protrusion on the cheek has shown itself. The disease should then be removed with the skin involved and any portion of the bones that have become softened, and the deeper parts attacked by the application of escharotics, such as the chloride of zinc paste, or some other equally effectual form (see Mr. Lawson's case in the Appendix, Case XLVIII).

Several instances are recorded in which suppuration around sarcomatous and osseous tumours has caused their spontaneous detachment from their seat of implantation; and the disease has then cured itself by being discharged through an ulcerated opening in the cheek or mouth. Dupont relates a case of the kind in the "Mémoires de l'Académie Royale de Médecine" (tom. v, p. 235), and in the same "Mémoires" there is the report of a case of M. Chastenet. Following a blow on the face, with extensive ecchymosis, tension, and pain, a tumour appeared, which, after having caused caries of the upper jaw, discharged pus into the mouth near the canine teeth. After a lapse of two

years, most serious symptoms came on; the whole of the lower part of the upper jaw and palate separated, and with these bones the surgeon removed an enormous fungus, which had distorted the face and had come to maturity in the nasal fossa, though its root was implanted in the antrum.

Mr. Hilton has also recorded a case of ivory exostosis of the upper jaw, which became spontaneously detached and fell out of the face in a similar way.

Such cases are too rare to justify the expectation of any similarly fortunate termination of the disease in an ordinary way; but their occasional occurrence is a noteworthy feature in the history of such affections, and seems to indicate a line of treatment in imitation of nature's spontaneous efforts. Hence caustics and the actual cautery have been applied to some of these tumours, but the result has not often been fortunate, and I am not aware of any instance of successful removal of any tumour by these applications alone, though it is possible that they may prove very useful auxiliaries in extirpating growths that cannot be reached by the ordinary operative procedures alone. Of the caustics used, the chloride of zinc, made into a paste with starch and liquid extract of opium, offers the best possible combination for the purpose, and has been used in many cases of malignant growths with most surprising effects.

The galvanic cautery has also been employed, but with very indifferent results. In a case (under my care in July, 1866) of supposed malignant sarcoma of the upper jaw involving the antrum, no cutting operation being deemed advisable, Dr. Broadbent's plan of injecting acetic acid into the disease was tried. The effect was to produce softening and suppuration of the part injected, but the disease was too extensive to allow of the treatment being thoroughly carried out, and the patient died exhausted before any very perceptible diminution in the bulk of the tumour had taken place (see Case XLVII in the Appendix).

After removal of portions of the upper jaw for disease, if the incisions have been well contrived, the amount of deformity left

is very slight as compared with the magnitude of the operation. Two months after removal of the whole antrum for a fibro-cystic growth, a patient of Mr. Gant's (exhibited by him before the Medical Society of London in January, 1874) presented no disfigurement of the face, and could eat without inconvenience and speak distinctly.

Even when the whole upper jaw and malar bones have been excised, the resulting gap can be filled up by a vulcanite artificial jaw, and the patient's appearance is then singularly free from disfigurement.

SECTION VII.

The Diseases of the Lachrymal Sac and Nasal Ducts.

Subsection 1. The Anatomy and Functions of the Lachrymal Sac, &c.

„ 2. On Obstructions of the Sac and Duct.

„ 3. Chronic Dacryocystitis, or Mucocele.

„ 4. Acute Dacryocystitis, or Abscess of the Lachrymal Sac.

„ 5. Lachrymal Fistula.

„ 6. Polypi of the Lachrymal Sac.

„ 7. Calculi and Foreign Bodies in the Excreting Lachrymal Passages.

Subsection 1.—*The Anatomy and Functions of the Lachrymal Sac, &c.*

The nasal fossæ communicate with the mucous membrane of the eyelids through a series of channels (the lachrymal canals), which open into the inferior meatus. These channels commence at the minute orifices (*the puncta lachrymalia*), seen on the margin of the lid, at the outer extremity of the lacus lachrymalis, situated at the summits of slightly-elevated papillæ (the *papillæ lachrymales*), and leading into minute canals (the *canaliculi*), which proceed inwards to terminate side by side in the *lachrymal sac.*

The *superior canaliculus,* the longer and smaller of the two, at first ascends, and then bends at an acute angle, and passes inwards and downwards to the lachrymal sac. The *inferior canaliculus* at first descends, and then, abruptly changing its course, passes almost horizontally inwards. They are dense and elastic in structure, and somewhat dilated at their angle.

The *lachrymal sac* is the upper dilated extremity of the *nasal duct,* and is lodged in a deep groove formed by the lachrymal bone and the nasal process of the superior maxillary. It is oval or pear-shaped in form, the upper being the wider portion, and closed in and rounded, and the lower end being narrower and continuous with the nasal duct. The canaliculi open into a point on its external aspect, about three lines below its upper rounded extremity. It is covered by the tensor tarsi muscle, and by a fibrous expansion derived from the tendo oculi, which is attached to the ridge on the lachrymal bone. In structure it consists of a fibrous elastic coat, lined internally by mucous membrane; the latter is continuous through the canaliculi with the conjunctiva, and through the nasal duct

with that of the nasal fossa. The *nasal duct* is contained in an osseous canal formed by the superior maxillary, lachrymal and the inferior turbinated bones. It opens by a somewhat expanded orifice, with an imperfect membranous valve, into the inferior meatus.

The mucous membrane of the canaliculi is covered with squamous epithelium, but in the lachrymal sac and nasal duct the epithelium is ciliated as in the nose. (Gray's "Anatomy," p. 596.)

The dimensions of the lachrymal sac and nasal ducts respectively, in the dead body, are thus given by Messrs. Arlt and Weber (Archiv für Ophthalmologie, t. 1, A 2, p. 135, and *Klinische Monatsblätter*, 1863, p. 63).

M. Arlt.		M. Weber.	
Lachrymal Sac.			
	Millim:		Millim:
Length 10 (=0·9397 of an inch)		Length	12 to 15
Depth (from front to back) .	4	Depth	6
Width	4	Width	4
Nasal Duct.			
Length . .	10 to 16 Millim:	Length . .	10 to 12 Millim:
Depth . .	1½ to 2½ „	Depth . . .	4 „
Width . .	„ „ „	Width . . .	3 „

These dimensions in the living subject would be rather less, as will be at once evident, if we consider how all the mucous membranes become shrunk and attenuated after death. Consequently, the width and depth of these canals must be taken as rather less than the figures above given would imply:—the length of the canals will be pretty much the same during life as after death.

According to my own measurements, the lachrymal sac varies in length from $\frac{2}{5}$ inch to $\frac{3}{5}$ inch, and the nasal duct from $\frac{2}{5}$ to $\frac{1}{2}$ inch; so that the total length of the sac and duct together will be rather more than an inch in the larger specimens and rather less in the smaller. From the upper end of the sac to the floor of the nose is about $1\frac{1}{2}$ inch in the adult of average size.

The variations of size and form of the features, and especially those of the nose, in different individuals, at different ages, and

in different races of mankind, will cause corresponding variations of size and shape of the lachrymal sac and nasal duct. The channels thus described convey the tears, and perhaps some of the ordinary mucus, from the conjunctiva to the nasal fossæ. The constant flow of moisture over the eyeball being a necessity, a channel for the conveyance of the stream after it has served its purpose is also required, and the consequences of an obstruction to the free passage of tears by these canals, clearly demonstrate the object they fulfil when in a patulous and healthy condition. They prevent the overflow of tears and mucus upon the cheek, and they secondarily assist in keeping up a supply of moisture for use in the lubrication of the nasal fossæ.

Subsection 2.—*On Obstructions of the Lachrymal Sac and Nasal Duct.*

If we glance at the anatomical relations of that series of channels making up the excreting lachrymal apparatus, we observe that there are three, or perhaps, four principal points at which obstructions are likely to occur, viz., (1) the points of entrance of the canaliculi into the sac, (2) the point at which the lachrymal sac enters the nasal duct, and, (3) the valvular termination of the nasal duct in the inferior meatus of the nose ; and, (4) perhaps, at a partial fold or dissepiment about the middle of the nasal duct.

The most common obstructions are due to alterations in the mucous membrane ; and thickening of this membrane from congestion or inflammation, is the most frequent kind of alteration. Next in frequency, come obstructions due to ulceration and contraction of cicatrized ulcers, and next to these, alterations of the bony walls, such as periosteal thickening or swelling from any inflammatory cause. For convenience, we will divide all causes of obstruction into two classes ; (1) those that are *temporary* in their nature, and require no mechanical dilatation in order to remove them, and, (2) those of a *permanent* kind, in which mechanical dilatation is absolutely essential. The first class, I

believe, includes a much larger number of cases than was at one time thought, and I have learnt by experience that many cases of epiphora, even when associated with mucous regurgitation through the puncta, will get well, either spontaneously or with the aid of constitutional remedies and local counter-irritation of the skin of the region of the sac. The catarrhal or other swelling of the mucosa passes off in this region, as it does in the Schneiderian membrane, and in the conjunctiva, and leaves the channels free from obstruction, as soon as the general health is restored. But it cannot be denied, that what was at first a *temporary* obstruction, may pass into the *permanent* condition if neglected. If, for example, the flow of tears and mucus is stopped for a considerable time, and these secretions accumulate, so as to distend the lachrymal sac, the effect is to set up acute inflammation in those parts at which the pressure is most felt, and ulceration and a glueing together of the opposed surfaces may take place at the narrowest parts of the channel, and a membranous, fibrous, or even a bony obstruction may be thus induced. So that, in any case in which there is a doubt as to the nature of the obstruction, it is better to assume it to be of a permanent character, and to employ mechanical dilatation *tentatively*, than to lose time by the use of ineffectual remedies.

Diagnosis of *Temporary* as opposed to *Permanent Obstructions.*—We judge that an overflow of tears is due to *transient* causes if it has come on in the course of catarrh, or has immediately succeeded an attack of any form of rhinorrhœa, and if the discharge from the puncta, on making pressure over the region of the sac, is small in quantity and nearly transparent, consisting, in fact, of but slightly turbid mucus, and if these symptoms have only recently shown themselves in a patient with some constitutional weakness, especially in very old or very young persons. It is more certainly ascertained that there is no permanent obstruction, if saline injections through the puncta have been made use of, and the solution has found its way into the nose and pharynx. Under these circumstances, we may generally succeed in relieving the patient without any operative inter-

ference, by constitutional treatment only, or with the aid of local counter-irritation. Iodine paint applied over a very limited space between the inner canthus and the bridge of the nose, is very useful in these cases, and when there is reason to suppose that the obstruction is due to swelling of the lower end of the nasal duct, the inhalation of a mixture of carbolic acid ammonia and spirits of wine, or the use of the scented snuffs, will generally overcome the obstruction and relieve the patient.

Subsection 3.—*Chronic Dacryocystitis, or Mucocele.*

Chronic dacryocystitis, or *mucocele*, most commonly results from the extension of catarrhal inflammation or scrofulous catarrh from the conjunctival surface. There is often a similar affection of the nasal mucous membrane associated with that of the eyelids, and in either case the canal of the lachrymal sac, or of its continuation into the nose, is liable to become engorged and choked with mucus. The consequence of this is, that the flow through it is obstructed, mucus collects and distends its cavity, the tears flow over the eyelid on to the cheek, there is regurgitation of mucus from the puncta lachrymalia when pressure is made on the sac, the skin over it becomes red and sometimes inflames and ulcerates, and the nasal fossa of the corresponding side becomes dryer than before.

Mucocele seems, in some cases, to arise from obstruction to the flow of tears through the canaliculi. If the puncta lachrymalia happen to be everted, or thrust away from the eyeball from any cause, as, for instance, by chronic thickening of the eyelid, there is an overflow of tears, and the lachrymal sac becomes choked with mucus and congested from an insufficient supply of moisture passing through it. The chronic thickening of the eyelids may be an indication of a similar chronic thickening of the lining membrane of the sac, each being the result of a precedent attack of catarrhal inflammation, or of a chronic conjunctivitis with nasal complications, such as are often seen in the case of scrofulous children.

The superficial appearance of swelling at the inner side of the eye is at first often quite insignificant, and indeed not noticeable until pressure being made on it by the finger, mucus or pus regurgitates through the puncta; but if the disease has continued for any considerable time, the swelling of the sac becomes very conspicuous, and in a case that has gone on uncontrolled or neglected for years it may present a prominence at the sulcus, between the inner canthus and the nose, of the size of a filbert, or even larger. This swelling is generally marked over its centre by a horizontal depressed line or furrow, showing the position of the tendo oculi and its relation to the distended sac.

The diagnosis of cases of mucocele is generally not difficult; tumors or cysts in the immediate neighbourhood of the sac sometimes bear a superficial resemblance to mucocele, but they are rarely so situated as to cause obstruction to the flow of tears, and hence epiphora, the most characteristic symptom of mucocele, is almost always wanting in the case of tumors. My late colleague, Mr. E. C. Hulme, informs me that he, on one occasion, met with a tarsal cyst occupying the position of the lachrymal sac, but superficial to it, and in this case the resemblance to a case of mucocele was very striking, though, on opening the cyst and evacuating its contents,the true nature of the case became evident. Sometimes, though the obstruction in the lower part of the sac or the nasal duct may be sufficient to prevent the flow of mucus through them into the nose, yet, when pressure is made over the swelling, it disappears, without any appearance of mucus from the puncta, and the patient experiences a sensation of fluid having passed into the nose. The obstruction has, in fact, been overcome by the pressure employed, though the ordinary flow has been insufficient to effect its passage through the congested and swollen membrane. Patients frequently find this out for themselves, and, by employing pressure with the finger over the region of the sac, empty it into the nose as often as they find its bulk increasing. By doing this at rather frequent intervals during the day, they are able to avoid, to a great extent, the inconvenience resulting from a constant overflow of tears.

In most cases, however, this cannot be done, the constriction in the duct being too rigid or too tight to allow of the emptying of the sac in that easy way. It is then necessary to overcome it by the following series of operations: first, the canaliculus of the lower eyelid is laid open, either by passing a small grooved director into it, and then guiding a narrow cataract knife or small scalpel along it and slitting up in that way, or by using the small straight knife (fig. 15) devised by Mr. Bowman (which I always employ, and find more convenient than the use of the director); or lastly, it may be done with a pair of finely-pointed straight scissors. This done, a probe should be passed along the canaliculus and into the lachrymal sac, and then turned into a vertical position and passed down to the obstruction in a direction downwards, backwards, and a little outwards. The constriction will yield, and the probe passes down into the nose. If it has taken the right course, and is lying in the lachrymal sac and nasal duct, its free extremity will be resting against the upper margin of the orbit, and its course will be described by a line which, passing through the centre of the tendo palpebrarum, cuts through the inner extremity of the eyebrow above, and the interval between the second incisor and canine teeth below. This line corresponds very nearly with the superficial furrow between the ala of the nose and the cheek. The upper end of the probe will also be inclined obliquely forwards and inwards. If it lie much outwards, it must have passed through the os unguis into the nose; if it lie too obliquely forwards and inwards, it may have passed into the antrum. Any marked deviation from the position above indicated will imply a faulty direction of that part of the probe which is not visible. The passing of the probe requires some skill and delicacy of manipulation, but it is rare that any mischief results from it, although rough handling or imperfect knowledge of the anatomy of the parts may lead to disastrous results here as elsewhere.



Fig. 15.

Having overcome the obstruction, it is well to leave the

probe in the stricture for a few minutes, in order to subject it to some amount of pressure, and so to favour subsequent absorption. I prefer the probes of the form figured. (See fig. 16 and fig. 17.) They are made somewhat thinner towards the point than above, and terminate by a bulbous extremity. Mr. Bowman's probes are made in four or five different sizes, to suit the varying amounts of constriction met with, and are formed into a spiral, so that by slightly rotating one on its axis the point may be made to describe a circle, when within the sac, and thus have a better chance of coming upon the aperture, or that part at which least resistance is offered. For certain cases of very tight stricture it is well to be provided with a set of these fine probes, but the smaller the probe the greater the risk of running its point between the mucous membrane and the bone, and so making a false passage; whereas with the bulbous-pointed probe it is impossible to do this without employing much greater violence than any prudent surgeon would be likely to attempt.



Fig. 16. Fig. 17.

After removing the probe, a few drops of blood will generally flow from the nostril, and sometimes there is pretty free bleeding. This is generally hailed by the surgeon as a sign that he has passed through the stricture satisfactorily. The probe will have to be passed at intervals of two or three days until all signs of stricture have disappeared. Probably after the first few times of passing it, the mucus that regurgitates on pressure over the region of the sac will be mixed with blood; then, in a few days, it may become purulent or muco-purulent, and if this be associated with swelling, heat, redness, and tenderness of the parts adjacent, it will be advisable to discontinue the use of the probe for a week, as there is probably too much inflammatory action going on in the part, and any increased irritation would lead to mischief. If, however, the purulent discharge is only slight, and unaccompanied by inflammatory redness, the probe may still be

used at intervals, and in the course of a few days the regurgitation on pressure will be simply serous or will not occur at all. In the meanwhile the overflow of tears has been steadily becoming less and less troublesome, and at length disappears altogether.

Whenever the progress is slow, and in all cases when the general health seems in any way at fault, constitutional treatment will be required in addition to the local manipulations. In young people scrofula is often associated with mucocele, and cod-liver oil and iron are often necessary. In elderly people a gouty diathesis is sometimes found with this affection, and regulation of the diet and medicines directed against faulty assimilation and secretions will be required. In ill-fed people, such as we see at hospitals frequently, improved diet often seems to be the most essential means of improving the patient's general health and tending to remove his local ailment.

If we find that, even after the obstruction has been overcome and the general health improved, there is still a discharge of mucus or pus, and still an overflow of tears, it is probable that the sac has become altered in character and its secreting function has become so vitiated by long continued inactivity that it requires some stimulating application. To effect this a syringe,* somewhat like that known as Anel's (but having certain special modifications in its structure), may be employed to inject solutions of metallic salts into it from time to time.

A solution of sulphate of zinc (gr. 4 to f. ℥i) or of chloride of zinc (gr. ss. to f. ℥i) will often improve the character of the

* The syringe should have two or three fine nozzles of different sizes, curved so that they can be passed easily into the sac, and the nozzles should be attached to the body of the syringe by means of an india-rubber tube, which is freely movable, being capable of detachment and reattachment by a simple joint without a screw.

This flexible piece of india-rubber enables the operator to work the piston of the syringe at an angle to the part in the sac, and without causing any jar or wrench to that part lying in the sac. A syringe for this purpose, with a plated metallic barrel instead of glass, as they are ordinarily made, is sold by Messrs. Krohne and Sesemann, and is admirably adapted for the purpose for which it is designed.

secretion of the mucous membrane, if injected every other day or every third day, by means of the syringe above described, or by any other suitable apparatus.

If all these means fail to stop the overflow of tears and the mucous regurgitation on pressure, we next proceed to pass a style and to keep it in the duct for some weeks until the passage has become thoroughly dilated. The soft virgin silver is the most suitable material for a style, and it should be made with a narrower portion at its upper end, which can be turned over the edge of the eyelid and so retained in position.* For hospital use the pure leaden style used by Mr. Green, of Philadelphia, and which I have myself very frequently employed, answers extremely well. It is a good plan to use a rather thin style at first, and in a week to replace it by a larger one, until at the end of three or four weeks one of the size of a crow-quill may be introduced.

In very obstinate cases, or in neglected cases that have been of many years' duration, the larger the diameter of the style employed the better the chance of a permanent cure. The sac is sometimes so much distended and thickened by chronic mucocele that its walls lose their elasticity, and hence, when the natural channel is restored, the sac still remains as a prominent and unsightly tumour at the upper part of the cheek. To overcome this, it is a very good plan to lay open the sac and dissect out a portion of its anterior wall, cauterising the interior with solid nitrate of silver, and then to bring the edges of the skin together by sutures. There is some risk of leaving a fistula, but this will not generally happen, if the obstruction in the lower part of the sac has been previously overcome by

* The virgin silver was first employed as a material for styles by Mr. E. C. Hulme, and are described by him in an article in the *Medical Times and Gazette* of May 21st, 1859. Some further valuable observations of Mr. Hulme's on the subject will be found in a letter in the *Brit. Med. Journal* of April 11th, 1863. Mr. Hulme still considers these virgin silver styles to be very useful "in appropriate cases, especially in hospital practice, where time is of such importance to both patient and surgeon. I never saw," says Mr. Hulme, "any bad result, nor even any objection on the part of the patient to their use."

appropriate treatment. Another plan is to pass a seton through the prominent parts of the sac and leave it in until free suppuration is established, after which contraction will be almost sure to take place and the seton can then be removed. The cases, however, that require this plan of treatment are very rare.

In very obstinate cases some surgeons have employed the actual cautery for the purpose of obliterating the sac, but this is a method of treatment which seems both illogical and unnecessarily severe. It is much better to lay open the sac freely and apply solid nitrate of silver to the exposed mucous membrane, leaving it open until free suppuration is established and healthy granulations have sprung up. Meanwhile, as soon as the acute swelling consequent on the application of the caustic has subsided, probes should be passed daily through the previously-opened canaliculus, and the stricture dilated by progressively increasing the size of the probes employed. The object of this treatment is not, of course, to obliterate the sac, but to cause a more healthy secretion of its lining membrane, to destroy the thickening of the submucous tissues, and to reduce the calibre of the sac by the shrinking consequent on cicatrization.

Some cases of mucocele are found to depend upon the persistence of very tight strictures, which resist the passage of probes altogether, or only admit very small probes, and with great pain and distress to the patient. The stricture is, in these cases, due to cartilaginous thickening of the submucous or periosteal tissues at the lower end of the sac, or in the nasal duct, or possibly may depend upon chronic thickening of the bony walls of the canal. Under these circumstances I have found the division of the stricture by means of Stilling's knife (fig. 18) has been a most successful operation. In order to perform it the patient, unless of very heroic temperament, should be put under the influence of an anæsthetic. The canaliculus having been previously laid open, a probe is passed into the sac, in order to enable the surgeon to ascertain the seat and nature of the stricture. Stilling's knife being then



Fig. 18.

passed at first horizontally, its point is turned downwards, and its cutting edge held forwards, and it is then carried vertically downwards until it meets with the stricture. This is divided by turning the cutting edge against it in three or four different directions; next a full-sized conical probe (fig. 19) is passed, with the intention of freely dilating the newly divided edges; and lastly, a silver style introduced, and left in for a week or ten days, or until the discharge assumes a simply serous character. After the removal of the style it will be necessary to pass a probe about once or twice a-week for several months, as there is a great tendency to the return of such strictures if neglected. It is important, in the treatment of such cases, to ascertain that the obstruction to the flow of tears into the nose is not due to acute periostitis, nor to the presence of necrosed bone. These conditions are indicated by inflammatory redness, pain, and exquisite tenderness over the bones and cartilages of the nose; and of course the operation just described would be entirely unsuitable, or even mischievous, when such a set of symptoms present themselves. Various instruments have been devised for division of strictures of the nasal duct, among others the guarded canula-lancet (Bowman's) may be occasionally useful: but, in the majority of cases, the operation can be better performed with the aid of Stilling's knife than with that of any other cutting instrument.



Fig. 19.

In those extremely rare cases in which the obstruction is due to exostosis in the nostril, or to chronic thickening of the bony walls of the nasal duct, consequent on disease or injury, it is possibly the best way to establish a passage directly into the nostrils by perforating the os unguis, and keeping the aperture open by daily probing for a week or ten days. Constitutional treatment will, in some cases, be required, but in the majority the removal of the obstruction is sufficient to effect a cure. That the disease is constitutional is not necessarily proved by the fact of its affecting both lachrymal sacs. This symmetrical

form of dacryocystitis is not at all uncommon, but it more often depends upon a previously symmetrical blepharitis than upon constitutional defects; sometimes, however, both causes operate together.

Subsection 4.

Acute Dacryocystitis, or *abscess of the lachrymal sac*, may arise from a variety of conditions. Perhaps the most common cause is the supervention of acute inflammation on chronic mucocele. The continued irritation caused by the mucus accumulating in the sac gives rise to puriform discharge, the lining membrane becomes inflamed, and the tissues around it become involved in the same unhealthy action. In scrofulous children, as a consequence of the extension of catarrhal inflammation from the adjacent mucous membrane of the nostrils, or from the conjunctiva (sometimes both being involved in the same action at the same time), there is sudden swelling and inflammation in the sac and its integumentary covering, with acute pain and overflow of tears on the cheek. The skin soon becomes red, sometimes both eyelids and the adjacent parts of the cheek are swollen, and after a few days, or at the end of a week, there is evident pointing of matter near the inner canthus, generally a little below the tendo oculi, and at this stage fluctuation is felt distinctly over the most prominent part of the swelling. If the abscess is allowed to go on uninterrupted, the reddened integument becomes thinner and thinner at this point, and ultimately bursts, giving exit to a purulent discharge; or, in rare cases, though there has been no pointing of matter on the cheek, the swelling of the eyelids and in the region of the sac may suddenly disappear, after the discharge of pus and blood from one nostril, the patient experiencing immediate relief. When this happens, we must suppose that the abscess has found its way into the nose through a very thin os unguis, or through one that has become softened and perforated by pressure. The pain, swelling, and redness then subside, but a discharge continues from the ulcerated aperture, and unless further treatment is adopted, a

fistulous opening remains permanent, and the overflow of tears continues. In adults especially, if the general health is bad and broken down by debilitating causes of any kind, acute abscess may come on in the course of any catarrhal attack affecting the mucous membranes of this region.

These abscesses frequently follow febrile disorders, such as measles, scarlatina, and typhoid fever, and in aged persons may be the result of gouty catarrh of the conjunctiva. Among the less frequent exciting causes of abscess, syphilis affecting the bones of the nose, and causing caries or necrosis, is occasionally observed. (Case LXVI in Appendix.) There is then acute pain and tenderness over the affected parts, and on opening the abscess, the probe comes in contact with bare bone, which is sooner or later removed or discharged from the opening in the form of a sequestrum.

Chronic periostitis may give rise to abscess by obstructing the nasal duct and causing accumulation of mucus, and subsequently purulent inflammation.

Polypi and other tumours within the nostrils may cause similar obstruction and subsequent inflammation; and lastly, injuries of the bones of the nose bring about the same series of morbid processes, sometimes with the complication of necrosis of the parts injured.

In one case that came under my care some years ago, the exciting cause of the abscess seemed to be inoculation with the poison of glanders, accidentally spurted into the patient's eye. (See Case LXIII in Appendix.) Any animal poison, such as that of gonorrhœa or syphilitic discharges, may similarly excite the lining membrane of the lachrymal sac to suppurative inflammation.

Diagnosis.—In a case in which there has been epiphora and other symptoms of obstruction in the sac for any lengthened period before the outbreak of the acute swelling in the region of the sac, it is not difficult to seize at once on the true nature of the case. The swelling in any case is situated, in the first instance, between the root of the nose and the inner canthus,

and in this region the finger will detect at this stage a round induration which is extremely tender, and which the patient instinctively endeavours to protect, shrinking away suddenly the moment it is touched by the surgeon. But in the majority of cases the patient does not present himself until the swelling has extended considerably beyond the limited area above mentioned, and both eyelids and the upper part of the cheek are often involved in one uniform swelling; so that at first sight it is quite possible to regard the case as one of erysipelas of the face, or of inflammation or abscess of the eyelids or the orbitar cellular tissue. An alveolar abscess of the incisive or canine fossa sometimes gives rise to a somewhat similar swelling of the cheek and lower eyelid, and hence mere ocular inspection will seldom suffice for the purpose of diagnosis. A careful and delicate exploration of the region of the sac with the finger will, if it be a case of abscess of the sac, invariably detect the round or oval induration, marked superficially by a horizontal band due to the stretched tendo oculi (not, however, always distinguishable), which is characteristic of the special case in question. Abscess or tumour starting from the frontal sinus, or the orbitar cellular tissue, will be felt higher up and more above the line of the tendo oculi, that of abscess of the sac lies principally below this tendon and sometimes entirely below it. Abscess in the alveolar border will present the tender and swollen prominence in the region of the canine or incisive fossa, and will be detected when examined within the mouth.

Erysipelas will be distinguished from all these cases by the uniformly tense and shining character of the integumental swelling, by the excessive general febrile disturbance, and by the absence of any one tender and indurated spot or area of tumefaction in the subcutaneous tissues. In the more advanced stages of abscess of the sac, the swelling of the eyelids and upper part of the cheek subside, and there is then a circumscribed swelling, visible to the eye and easily defined by the finger, lying between the root of the nose and the inner canthus, but most prominent at the inner extremity of the lower eyelid.

In this area fluctuation soon becomes perceptible, and if the knife is withheld the skin becomes discoloured, attenuated, and at last gives way with the escape of pus. In two cases in my own practice, occurring, one in a young child and the other in a woman of forty, the abscess burst through the os unguis into the nose, and should this occur the diagnosis would be more difficult and uncertain. Abscesses superficial to the sac and boils in this region are sometimes mistaken for the more deep-seated purulent collection; but in these cases there is an absence of the overflow of tears which is invariably present in the case of true abscess of the sac, and the swelling is from the first more superficial and more strictly confined to the skin and subcutaneous areolar tissue in the case of boils or cutaneous abscesses.

The presence of tumours or polypi in the nostrils, as an exciting cause of the mischief in the sac, will be easily detected by an examination of the nostrils. Syphilitic periostitis of the bones or necrosis following it are characterized by their history, and by the excessive tenderness and pain over the region of the bones affected.

Treatment.—If the case is seen in the very earliest stage when the symptoms are those of obstruction, with some amount of tenderness and swelling in the region of the sac and slight febrile excitement, it may be possible to arrest the progress of the inflammation by putting on one or two leeches over the sac or within the nostril, applying afterwards the ice-bag continuously, or as long as the patient can bear it with a feeling of comfort. If, however, the superficial parts have become swollen, and it is evident that pus has already formed, it is better to open the sac without further delay. There are two ways of doing this. If the superficial swelling be moderate, and does not involve the lower eyelid to any great extent, it is a very good plan to lay open the lower canaliculus, or, if this cannot be conveniently reached, the upper canaliculus, and at the same time to carry the point of the knife on into the sac itself, freely dividing its outer wall on the conjunctival aspect. Mr. Bowman's

canaliculus knife (see fig. 15) is an extremely convenient instrument for this purpose, and can be manipulated more easily than the canaliculus director and scalpel or cataract knife. In any case the sac must be opened freely, and we can only be satisfied that this has been done by seeing pus escape through the incision. It is often difficult to prevent this incision closing too soon, and this can only be prevented by passing a probe between its edges daily for three or four days after opening the abscess.

It is seldom that this method of operating can be carried out. The abscess may have so far ripened that the skin at the inner extremity of the lower eyelid is threatening to give way, or has become so far attenuated that it is hopeless to attempt to prevent its ulcerating sooner or later; or though there may be no pointing on the cheek, there may be so much swelling of the eyelids and the adjacent parts that it is impossible, without great pain to the patient, to reach the canaliculus and incise the sac through it. Hence the more usual plan is to make an incision into the sac at its most prominent part, below the tendo oculi. A small scalpel, or long cataract knife, is the most convenient instrument for this purpose. Its point should be entered a little below the inner canthus and thrust nearly vertically downwards, but with a slight inclination towards the nose and somewhat backwards, so as to clear the lower margin of the orbit, on withdrawing it (which should not be done until matter is reached and escapes by the side of the blade), the incision should be enlarged to the extent of three lines, or a quarter of an inch, in a direction obliquely downwards and outwards. The patient should be lying down during this operation, with his head supported on a pillow, and the surgeon stands at the head of the couch behind him; or, if this be inconvenient, the patient may be seated on a low stool and the surgeon stands behind him, supporting his head against his chest and steadying his hand on the forehead of the patient.

The incision should be probed on the following day and for two or three days subsequently, as it has a tendency to become united by the first intention, in consequence of the accurate

adaptation of the parts, due to the great superficial swelling so often accompanying this affection.

The relief to the pain and discomfort by an early opening of an abscess of the sac is very marked, and hence an early incision is always to be advised, provided the diagnosis is clear and there are no contra-indications of another kind. If the abscess is allowed to break, it often leaves a ragged opening on the cheek, which takes a long time to heal, and perhaps forms a permanent fistulous opening. (Cases LXIII and LXIV in Appendix.)

As soon as the acute symptoms and swelling of the parts have subsided, means must be employed for restoring the perviousness of the natural passages. The canaliculus must be laid open freely and kept patulous by passing a probe, and as soon as the extreme tenderness of the region of the sac has subsided, the lachrymal probe should be passed into the nose through the sac and nasal duct. A small probe only will pass in the first instance, and the passage must be dilated by gradually increasing the size of the probe employed. It is generally found that as soon as the natural passage becomes pervious, the opening on the cheek gradually closes up, but in some cases a permanent fistula remains, which will have to be dealt with by subsequent treatment.

Subsection 5.

Lachrymal fistula is generally the result of a neglected or imperfectly-cured *lachrymal abscess.* If this be so, the first step in the treatment will be to ascertain the conditions of the sac as regards perviousness or the reverse. The constant overflow of tears on the cheek, and the regurgitation of pus or mucus on making pressure over the sac, will be the best evidence of obstruction in the nasal duct, short of actual probing. The treatment then consists in the various proceedings already described in the treatment of mucocele.

It is especially necessary to make use of the style in the treatment of fistula lachrymalis, and to continue its use until the fistulous opening has closed. It may be necessary to keep

it in the sac and duct for six months or more, and the larger the style employed the better. (Case LXIV in Appendix.)

If the fistula still remains open after the style has been in its place for some weeks, it is well to apply the solid lunar caustic to the edges of the fistula, and reduce thereby any redundant granulations that may be interfering with the formation of a cicatricial union of the opposed edges. This very often succeeds, but in very obstinate cases the actual cautery should be employed; the swelling of the adjacent parts caused by irritation of the actual cautery will sometimes bring the opposed edges more accurately into opposition, and at the same time adhesive inflammatory action is set up in the raw edges themselves, and a closure of the orifice is thus effected.

Sometimes the fistula is kept open by the protrusion of gelatinous-looking button-shaped granulations from the lining of the sac, and, when this is the case, the most effectual plan of operating is to dissect the skin carefully around the aperture, laying it open freely, to remove a portion of the anterior wall of the sac with its granulations, and to apply the solid caustic to the interior. The edges of the skin can then be brought together by one or two sutures, and Dr. Richardson's styptic colloid or collodion and cotton wool applied over the wound. In no case can the fistula be expected to close, unless the passage through the sac and nasal duct has been thoroughly re-established. Formerly lachrymal fistula was the result of wearing a style, but the modern method of passing the style through the mucous aspect of the lower eyelid has made this form of fistula a mere historical curiosity.

Subsection 6.

Polypi of the lachrymal sac are very rare. I have at present under my care a woman of about forty-five years of age, with a chronic obstruction to the passage of the tears through the right lachrymal sac and duct, which I suspect to be due to the presence of a polypus partly within the sac. I have frequently passed the lachrymal probes into the sac, and the patient wore a style

for several months with great benefit; but, notwithstanding some temporary relief, the overflow of tears returns, and when I last probed the duct there was a sensation as of some soft compressible body occupying the passage. The patient tells me that she formerly had a polypus or polypi removed from the nostril, and on examining the nostril there is a yellowish glistening body in the lower meatus, though the nostril itself is not obstructed by it. Should this prove to be a polypus in the sac, there will ultimately be considerable protrusion of its walls, and, in all probability, some external tumour and abscess presenting on the cheek.

At p. 136 of M. Gerdy's work "Des Polypes," a case is recorded of a woman, thirty-two years of age, who had had symptoms of mucocele for several years, but no abscess. A tumour was felt in the region of the sac; the latter was cut into, and a polypus of the size of a filbert removed. It was attached to the anterior wall of the sac. (See "Radius, Scriptores Ophthalmologici Minores," vol. ii, p. 139, Lipsiæ, 1828. See also another case of lachrymal polypus, related by Janin, in his "Mémoires et Observations sur l'Œil," p. 299, Lyon, 1772.)

Subsection 7.—*Calculi and Foreign Bodies in the excreting Lachrymal Passages.*

Two instances of concretions have already been given under the head of "Rhinolithes" (see Section II, Subsection 6). Several others are quoted in systematic works on ophthalmology, and the following case, quoted by Mackenzie from the "Philosophical Transactions" or Lowthorp's "Abridgment" (vol. iii, part i, p. 40), is perhaps equal, if not superior, to any other recorded instances in its marvellous circumstances and details:—

"A saddler's daughter had an imposthume, which broke in the corner of one of her eyes. Out of it there came about thirty stones as big as pearls, and splendid; after which she had a fistula, which was cured by Turberville, under whose care the

patient was." Could this have been a case of epithelioma containing "globes epidermiques" or "cancroid pearls?"

Dr. Krimer relates the following case (Gräfe and Walther's "Journal der Chirurgie und Augenheilkunde," vol. x, p. 597, Berlin, 1827), which very closely resembles the case reported on by Dr. Bristowe, in the "Pathological Transactions." (See Section II, Subsection 6.)

Case.—A woman had for nine months been affected with disease of the excreting lachrymal organs. The sac was swelled, hard, and upon the most prominent part of the tumour, which was red and painful, there was a small ulcer, which penetrated into the sac, and discharged pus, mixed with tears, especially on pressure. The nasal duct appeared entirely obliterated. When, in order to re-establish it, Dr. Krimer endeavoured to introduce a pointed probe, he withdrew on its extremity a concretion of the size of a small pea, the removal of which left the canal entirely free, and the fistula was promptly cured. The calculus was ash-grey, covered with thick mucus, polished, of a calcareous appearance, and insoluble in water, alcohol, and weak vinegar. Dr. Krimer thinks that it was formed in the lachrymal sac by inspissated mucus.

The foreign bodies in the lachrymal excreting canals have been generally styles that have sunk into the fistula and become buried in the skin, which may even heal over them, and so disguise the source of the troublesome overflow of the tears and mucocele which results from its presence.

If the presence of a style be suspected, the lower end of it may possibly be felt in the inferior meatus of the nostril by means of a probe, and if it be lying loose it may even be extracted through that aperture. The more usual and more effectual way of dealing with such a case is to cut down upon the supposed position of the foreign body in the region of the sac, and to seize and extract it by drawing it upwards through the aperture thus made.

SECTION VIII.

Diseases of the Skin and Subcutaneous Tissues.

Subsection 1. Herpes.

„ 2. Eczema.

„ 3. Comedones. Acne. Sycosis. Gutta Rosea

„ 4. Lupus. Syphilitic Tubercle.

„ 5. Epithelioma. Rodent Ulcer.

„ 6. Malignant Pustule. Delhi Boil. Aleppo Evil. Biskra Bouton.

„ 7. Nævus. Lipoma. Rhinoscleroma.

„ 8. Gangrene. Frostbite. Scurvy.

„ 9. Boils. Carbuncles.

SUBSECTION 1.

Herpes of catarrh frequently affects the upper lip and the adjacent parts of the alæ and mucous membrane of the nose. It appears in the form of a group of vesicles, each about the size of a millet-seed or a split pea, and is accompanied with general febrile heat, thirst, rapid pulse, and local irritation. In a few days the vesicles dry up into thin scabs, which are sometimes confluent, and not generally surrounded by any redness of the skin. An eruption of herpes on the upper lip and adjoining portion of the nose frequently accompanies attacks of intermittent and other fevers.

Herpes zoster facialis, when it invades the region of the ophthalmic division of the fifth pair, sometimes involves the nasal branch, and this branch is occasionally attacked alone. In the former case there is congestion of the conjunctiva, intolerance of light, irritation of the eyeball, and acute neuralgic pain in the whole of the region of the eye and side of the nose. In the course of twenty-four or forty-eight hours, an eruption of vesicles appears in the forehead, eyelids, and side of the nose, and generally ulceration of the cornea and great vascular congestion of the sclerotic. Serious impairment of sight is too often the ultimate result, and sometimes complete destruction of vision ensues. The nasal branch of the nerve may, however, be the only part involved, and the eruption is then confined to the side of the nose, and the eyeball is not affected. The eruption having become developed, the severe pain ceases or becomes much mitigated in most cases.

Diagnosis.—Before the eruption makes its appearance, the aspect is that of an acute neuralgic attack, and as it often

follows exposure to cold in persons of very feeble habit of body, it may be set down to rheumatism of the parts. But the vesicular eruption appearing on one side only of the face or nose, the appearances are characteristic.

Treatment.—In the commencement of the case soothing local applications, such as powdered starch, or liquid extract of opium, are indicated. At the same time, in the febrile form of the disease, effervescing salines may be given internally. When there is acute neuralgia, morphia or opium in some form will be necessary to relieve the pain. The hypodermic injection of morphia, as the most speedy means of relief, will be generally preferred. Gouty or dyspeptic conditions are not uncommonly associated with herpes, and must be met by appropriate remedies. Later on, in the cases of herpes zoster, if there are, as very commonly occurs, superficial ulcers in the site of the eruption, they may be dressed with zinc ointment, or a combination of calamine ointment and liq. plumbi subacetatis, or the ung. plumbi subacetatis, or the compound chalk ointment known as "Kirkland's neutral cerate," which is particularly useful in almost all irritable eruptive disorders, and of which the following is the formula:—

℞ Lead plaster, 8 oz.
Olive oil, 4 oz.

Melt together the plaster and the oil by heating over a slow fire, then add

Prepared chalk, 4 oz.
Distilled vinegar, 4 oz.
Goulard's extract of lead, 1½ oz.

Stirring the ingredients well together until they form a uniform smooth mass.

Lastly, add a few drops of essential oil of lavender, or oil of rosemary.

This cerate should be spread thickly over a piece of lint and applied to the ulcerated surface.

This preparation is superior in some respects to the ung.

diachyli albi, which consists of olive oil ℥xv, litharge ℥iii ʒvi, melted together, and ol. lavandulæ ʒii afterwards added to the mixture when cold. But the litharge ointment may be more quickly prepared, and is therefore more convenient in some cases.

The treatment of simple catarrhal herpes consists simply in protecting the surface by dusting it over with finely-powdered starch, or applying zinc ointment, until the scabs have died and desquamated. Ulcerations rarely occur in the catarrhal form, and it is often so simple an eruption that no treatment is required, apart from that directed against the associated catarrhal symptoms.

Subsection 2.—*Eczema.*

This affection, known also as porrigo larvalis and crusta lactea, often occurs on the alæ of the nose, at the point of junction of the skin with the mucous membrane, and extends both up the nostrils and on the adjacent surfaces of the lips and cheeks. The nose thus becomes enlarged, the surface reddened, and the passage of the air through the nostrils impeded. Eczema also originates on the mucous membrane, and the passage thus becomes obstructed by crusts and swollen membrane. It has been commonly asserted that this affection is peculiar to the strumous and strumo-rachitic diathesis, but according to Neumann's statistics, this opinion is hardly borne out by facts. (See Neumann's "Text-Book of Skin Diseases" translation by Dr. Pullar, p. 137.) He is rather inclined to regard it as associated with dyspepsia and disordered menstruation in the majority of cases, though in many its origin is obscure. Dr. Tilbury Fox regards it as a catarrhal affection of the skin, and it is remarkably frequent in association with ordinary catarrh, and after those exanthemata, and particularly measles, in which there is a previous catarrhal flow from the nasal mucous membrane. Possibly, the strumous diathesis predisposes to catarrhal affections, and hence eczema may be looked upon as one of the

indirect accidents of struma, though it may not be necessarily a consequence of the constitutional condition.

Acute eczema may affect the nose and lips in common with the rest of the face. The whole of the face is then reddened and swollen, and there is general febrile disturbance, preceded by a sense of chilliness. An eruption of vesicles appears:—these burst and exude a gummy discharge, which dries up into crusts, on the removal of which the surface beneath is red and moist, and subsequently becomes dry and scaly, with occasional alternations of moist exudation and renewal of crusting.

In the chronic form, there is generally no febrile disturbance at the onset, but the eruption appears as the sequel of a catarrhal attack, or as a continuation of the acute form. Vesicles appear, slowly developing into pustules, which form crusts covering a reddened surface, the exudation being continued in the form of a viscid gummy discharge. The swelling of the nose and lip is much less in the chronic than in the acute form, but the passage of air through the nostrils may be equally obstructed by the formation of crusts.

Treatment.—Neumann altogether derides the notion that constitutional treatment is the principal point to be attended to. "We never employ internal remedies, except in cases in which the affection is evidently dependent upon diseases of the internal organs." (Neumann, op. cit. p. 142.) There are, however, few cases of eczema of the nose and adjacent parts met with in practice, in which faults of digestion or assimilation are not strikingly brought under the notice of the practitioner. Hence, in the commencement of the treatment, purgatives will generally be required, followed by ferruginous tonics or quinine. Diet must be very carefully regulated. Excesses of any kind should be avoided, and in acute eczema, except in very old or feeble persons, all alcoholic stimulants must be at first forbidden.

When the patient is anæmic or chlorotic, steel in some form must be given; and arsenic is sometimes useful in obstinate cases.

The local treatment in acute eczema must be directed towards

moderating the excessive heat and inflammatory action of the part. Cold douches, or linen wet with cold water will be most suitable at this stage. Soda has a tendency to allay the feeling of itching and heat, and it may be added to the water. After the subsidence of the heat and redness, the crust may be dressed with ung. zinci oxid. or the litharge ointment (see p. 227), or the Kirkland's neutral cerate (see p. 226).

These applications are also suitable to the chronic form, but in addition the crusts must be softened once a-day by smearing with potash-soap and washing with warm water. Occasionally the application of weak astringent solutions of borax and alum (boracis venet. alum crudi aa ʒi, glycerine ʒii) may be used with advantage, and suppositories of cocoanut butter with oxide of zinc may be passed up the nostrils, and weak solutions of glycerine and sulphate of zinc (zinci sulphatis gr. ii, glycerine f. ʒss aq. ʒi) injected into the anterior nares, for the purpose of softening and detaching the crusts.

For eczema impetiginosum of the face in children, Neumann recommends the use of a mask of linen, the inner surface of which is smeared with oil or ointment, and which is to be kept on until the crusts are separated and new cuticle formed, and this plan is found to answer well, and is very convenient in the case of young children, as it obviates the necessity of a frequent change of the dressings.

In eczema rubrum of the face in gouty or dyspeptic patients, there is often great swelling and irritability of all the features. The itching in such cases is intolerable, and it will be necessary to give sedatives at night. Opium, however, is not well borne by these patients, but chloral hydrate succeeds in giving a good night's rest even in very extreme cases.

Locally, the application of flour and water made into a thin paste and smeared over the affected part and allowed to dry, serves the double purpose of a protective covering, and exerts, at the same time, some amount of pressure as it dries and contracts. If the drying up of the crust is uncomfortable, it may be easily relaxed by applying warm water with a camel's hair brush.

In these very irritable cases, after the subsidence of the swelling, olive oil may be brushed lightly over the surface, or the following ointment applied :—

℞ Adipis benzoat, ʒii.
Ceræ Albæ, ʒss.
Ol. Olivæ, ʒiiss.

The oil and wax to be melted down and the benzoated lard rubbed down with the other ingredients until a smooth ointment is produced.

In other cases the liniment aq. calcis is a good soothing and protecting covering.

Whenever these or other oily applications are used, it will be found convenient to cover the nose and features with a mask of tissue-paper. It is softer than any textile fabric, and can be quite as easily adapted to the parts, when thoroughly saturated with the unguent or oil.

In the case of gouty eczema, the secretions must be carefully regulated during the paroxysms of inflammatory swelling and redness, and especial attention must be given to the state of the urine. After the acute stage has subsided, tonics, and especially steel and chalybeate waters, will be required. In chronic eczema of a dry scaly form, and in the dry squamous tetter that sometimes follows the acute forms, the following paste is extremely useful—

℞ Camphor : ʒi.
Sp. vin. rectif. ♏xx.

The spirit to be added to the camphor in order to facilitate its reduction to a fine powder, and then rubbed up into a smooth paste with 3 oz. of glycerine of starch. This paste should be spread thickly over the scurfy part and covered with oiled tissue-paper, and it need not be changed for twenty-four or forty-eight hours. Under similar circumstances, the occasional use of the solution of soft soap (potash soap) in rectified spirits of wine answers well, and can be employed at the times of changing the starch and glycerine paste, as a means of cleansing

the surface and removing any adherent scales that may have accumulated beneath it.

Subsection 3.—*Comedones, Acne, Sycosis, Gutta Rosea.*

Comedones appear frequently in young persons at about the period of puberty, on the alæ and bridge of the nose, though they also infest the forehead, chin, cheeks, and shoulders. The comedo consists of a distended hair-follicle, the secretion of which, instead of passing upwards with the hair and lubricating it and the surrounding skin, becomes dry, indurated, and moulded to the form of the follicle. Its upper extremity, lying at the level of the orifice of the follicle, is marked as a black spot (of the size of the point of a pin, and sometimes as large as a pin's head or larger) visible to the naked eye. These spots sometimes become surrounded by a small elevation, which marks the distension of the follicle with its retained secretion, and sometimes the skin over this raised surface becomes inflamed, suppurates, and forms a pustule. This later stage of the *comedo* constitutes *acne.*

In the earlier stage, before redness and inflammatory swelling have come on, the contents of the follicle can be squeezed out between the two thumb nails in the form of a whitish-yellow worm-like thread, of about the thickness of a piece of sewing cotton, and in some cases of the thickness of a piece of whip-cord. These worm-like threads consist of closely-packed epidermic scales, which here and there exhibit an opaquely-dotted appearance, due to the presence of oil globules and a few free oil globules. The black spot on the top of this yellowish mass, which comes away with it, consists of a hard superficial layer of epidermic scales impregnated with dirt. Among the contents of the obstructed follicle is a small six-legged parasite, the *steatozoon* or *acarus folliculorum,* described accurately by Dr. Beale,* Mr. Erasmus Wilson,† and others.

* *Journal of Cutaneous Medicine,* vol. iii. No. 2, Oct. 1869.

† He gives a detailed description of it in his work on "Diseases of the Skin"

This morbid condition occurs in persons whose skin is naturally greasy, whose hair and nails grow fast, and whose heads are full of scurf. It is part of a general disorder of the whole cutaneous surface, the secretion of the follicles being excessive, while the parts of the subcutaneous tissue around them are deficient in activity.

Treatment consists first in remedying any constitutional defect that may be manifest. The secretions are always more or less unhealthy, and a combination of steel and aperients is generally useful. Amenorrhœa, or leucorrhæa or dyspepsia, will be met by remedies appropriate to each particular case. With regard to local treatment, the skin may be stimulated by gentle friction, kneading, and by the application of hot fomentations without soap. Those comedones which are evidently hard and dry and cannot be removed without mechanical aid, may be gently pressed out, and subsequently friction with fine oatmeal, and borax lotion will, in most cases, very soon improve the general condition of the cutaneous surface. Later on, bichloride of mercury, with almond emulsion, alkaline washes, alum lotion, and lastly the weak hypochlorite of sulphur ointment, may be used with much benefit.

Acne consists of retention of the secretion of the hair follicles, as in comedones, with the addition of perifollicular inflammation. It may occur as a complication of *comedones* and *milia*, or as a sequel of the former, and frequents the same regions of the cutaneous surface. At the outset of the disease

(p. 508 of 1st edition). He has also discovered the ovum and embryo of the steatozoon. The following are the extremes of measurement of the perfect animal in fractions of an English inch, according to Mr. E. Wilson:—

Entire Length.	Length of Abdomen.	Breadth of Thorax.
$\frac{1}{135}$	$\frac{1}{227}$	$\frac{1}{333}$
$\frac{1}{64}$	$\frac{1}{88}$	$\frac{1}{333}$

Neumann also describes them as existing very commonly in the sebaceous follicles of the normal skin.

it appears as raised conical points, exactly similar to those of comedones, and is then termed *acne punctata;* whereas in the later stages, when inflammation around the base of the swelling has come on, it is described as *acne indurata;* and still later when the swelling and induration are succeeded by vascular congestion and suppuration, as *acne vulgaris.*

The nose is not so frequently affected by *acne vulgaris* as the parts of the face adjacent to it.

Etiology.—At the period of puberty, the time at which acne is most commonly observed, there is greatly increased development of hair all over the body, the hair follicles therefore become more active, and, consequently, if there is any constitutional defect of nutrition, they become congested and inflamed. The acne pimple or pustule is the result. Want of cleanliness, exposure to cold, with general languor of the circulation, are associated causes. Dyspepsia, mental depression, disorders of the generative organs, and especially uterine disorders, are among the more prominent primary defects leading to the local disorder.

Treatment.—The treatment must be directed to three points. (1) The relief of local hyperæmia; (2) the improvement of the nutrition of the skin of the part; (3) the improvement of the general nutrition.

The local hyperæmia and irritation will be best allayed by soothing applications to the part, and by stimulation of the secreting activity of the internal organs.

Alterative tonics, combined with gentle aperients, will be required in the cases of atonic dyspepsia so often associated with this affection, and subsequently steel or quinine may be required. Locally, the application of a lotion containing oxide of zinc and calamine powder suspended in water, with a small quantity of bichloride of mercury (gr. i to ℥viii), will be very useful, when applied warm to the face. The later stages will require more stimulant applications, and in obstinate cases the general health will require a course of arsenic or iron, or the two in combination, before the debilitated digestive organs will

recover their proper condition. Soap should not be used in acne vulgaris.

General hygienic considerations are all important in the treatment; and especial care must be taken to attend to ventilation, exercise, and diet. The latter should be unstimulating but abundant and varied. Excess of sugar and alcoholic stimulants containing sugar are particularly hurtful, and pastry and rich dishes are to be avoided. Great cleanliness of the skin generally should be observed, and warm baths containing potash are especially efficacious in this respect.

Sycosis sometimes attacks the roots of the hair within the entrance to the nostrils. It presents at first the appearance of tubercles (of the size of a millet seed, a pea, or even larger) developing into pustules, which dry up into circumscribed irregular crusts. The pustules are each traversed by a hair, the root of which on being pulled out, is swollen, bent, and bathed with pus. The surrounding skin is considerably swollen and œdematous, and subsequently abscess may form and the submaxillary lymphatic glands become enlarged.

The Treatment should be local only. First, the crust should be softened by oily or watery applications, and then removed. The hairs must then be pulled out, and red precipitate ointment (gr. i to ʒi) applied, using also soap and water as a douche occasionally, during the change of dressings. Persons liable to acne and sycosis should avoid the use of scented soaps. If it is necessary to apply soap to the face, the best common yellow soap (known as "Knight's Pale Primrose,") or Pears' Transparent Soap, is far better for all purposes than the mixtures sold as scented soaps. Some of these latter have been proved to cause affections of the skin. Fine oatmeal rubbed gently over the face offers the best substitute for soap.

Gutta rosea is a condition resembling *acne vulgaris* in certain points, but differing from it materially in others. It resembles acne in attacking the hair-follicles of the face, and particularly of the alæ of the nose and the adjacent parts of the cheek; but it differs from it in being a disease of the middle

or rather late period of life. It is rarely seen in young adults. By some dermatologists, it is considered a variety of *acne*, and the spots are very similar in appearance to those of acne, whence it is sometimes called *acne rosacea*, but they are more spread out and less sharply defined at their circumference, and the cutaneous structures around are more uniformly involved in the same congested condition with which the pimples themselves commence. They sometimes become confluent, the whole of the alæ and adjacent parts of the nose being of an uniform rose-red colour, with here and there a few isolated elevations marking the position of the original pimples. In very severe cases, the whole of the nose, including the tip, becomes involved in a bright rose-red swollen eruption, giving the patient a truly Bardolphian aspect. In these extreme cases, the condition is very different from that of a simple inflammatory swelling and infiltration of the perifollicular structures, such as the early stages present. The whole cutis and subcutaneous areolar tissue of the part affected become congested and infiltrated with plastic exudation, and the surrounding skin is more or less œdematous in the worst cases. The raised spots dotted here and there over the surface have a shining, almost translucent texture, and every now and then pustules or raised vesicles form on the most prominent parts. The heat and sense of tension in the part is always increased after eating, and whenever the digestion is out of order. It is sometimes accompanied by cracks or fissures at the margins of the nostrils and extending somewhat into the nasal fossæ, and these cause great irritation, the patient being very apt to pick or scratch them with his fingers, and so increase the mischief.

Etiology.—This condition is almost always associated with dyspepsia, due to various causes. It occurs not unfrequently in persons who have been living highly, dining on rich food and taking three or four full meals a-day without sufficient exercise. It may also occur in persons who have been living moderately or even poorly, if they have indulged too freely in the sugar-containing articles of food and soft fluids, with an insufficiency

of animal food and fresh vegetables. Sedentary habits and mental uneasiness or anxiety increase the tendency to dyspeptic malaise, and thus to an aggravation of the chronic disorder in the nose and face. It is also associated with disordered menstruation occasionally in women about the time of the cessation of the catamenia.

Treatment.—In the milder and earlier stages of gutta rosea, much benefit will be derived by improved habits of diet, increased exercise, and the use of occasional aperients and antacid tonic medicines. The lotion of oxide of zinc and calamine powder is very grateful, when applied locally to the spots, and may be occasionally changed for Goulard water, and eau de Cologne and water whenever the heat and tension indicate some cooling application.

Free purging is essential in the commencement of treatment, the saline purgatives, such as sulphate of magnesia and sulphate of soda, or the Carlsbad salts, being of great value in all cases of the kind. Later on, a combination of mineral acids and cinchona, or steel with mineral acids, will generally be required, the patients being very often debilitated and their powers of assimilation weakened by long-continued dyspeptic ailments. Friction of the surface, tepid bathing, and a mild climate are important aids to the other remedies. In some cases arsenic combined with steel will be useful, when the simpler forms of tonics have failed to restore the healthy secretive activity of the skin. Alcohol should be allowed sparingly, and the lighter wines, such as hock and moselle, or vin de graves are preferable to richer and stronger kinds; while malt liquors are to be strictly forbidden. The local treatment of this disorder is of quite secondary importance, and is directed chiefly towards allaying irritation and protecting the part from exposure to cold and external irritants.

Subsection 4.—*Lupus. Syphilitic Tubercle.*

Though *lupus* may attack various parts of the skin of the general surface, it more often selects the face, and very commonly the nose and adjacent parts of the cheek. Under the forms designated as lupus erythematodes, lupus non-exedens, and lupus exedens, it may be described as a tuberculous affection of the skin with a great tendency to destruction of the parts attacked, either by ulceration or an intestitial absorption. Pathologically considered, it is well described as "the slow disorganization of all the structures comprising the cutis and cuticle attacked by it, in consequence of the deposition in the cutis vera of a neoplasm of low vitality; the tendency to shrinking or atrophy of the parts affected, or in other cases to their destructive ulceration, being due to the presence of this new deposit."

The primary seat of this neoplastic formation has been a subject of dispute among dermatologists, but the variation in their descriptions is probably due to their describing different varieties under the same name. Thus Rindfleisch and Neumann describe lupus erythematodes as essentially due to a morbid change originating in the sebaceous follicles, while English observers and Dr. Auspitz, of Vienna, fail to discover this affection of the follicles as the primary lesion in the variety of the disease known as lupus erythematodes in this country. It is therefore clear that two different affections are here described under the same name, and it will be convenient to consider the lupus erythematodes of the Germans as a distinct phase of the disease, and we thus arrive at the conclusion that there are four different varieties of lupus, each characterized by distinctive clinical and histological features. In this classification and in the succeeding descriptions I have followed, in the main, the admirable treatise of Dr. Tilbury Fox, to whom I am much indebted for many valuable hints in reference to this part of my subject.

The *lupus erythematodes* of the English consists of patches of a deep dull-red colour, smooth and shining and scaly at the

edges, even with the surrounding skin, or at a slightly lower level. The affected skin looks wasted and shrunken, as if it had been seared with a hot iron in small round patches. In this form no ulceration occurs, and the surface remains perfectly dry throughout, but after the morbid action has ceased, the surface which has been affected has a white scarlike aspect, and the nose becomes thin and pinched, especially at the margins of the alæ. The patches on the cheek also leave a white shining cicatrix, showing a loss of substance in the vertical direction, though none in the superficial area of the part.

In this variety, and probably in the early stage of the other forms, the first morbid change in the affected parts appears to be an extraordinary dilatation of the capillary blood vessels and lymphatics, and especially of those around the sudoriparous and sebaceous glands. This is so remarkably the case that Dr. Thin* is of opinion that it may be the principal and characteristic change in the tissues and the starting point of the lupoid degeneration. However this may be, it is tolerably certain that in the erythematous form of lupus, the neoplastic deposit is not constantly present in the early stages, and certainly not primarily deposited in the sebaceous glands; for cases have been recorded in which it has attacked parts (such as the sole of the foot and palm of the hand) in which no such glands are present.

Lupus non-exedens occurs in patches occupying the alæ nasi, and the adjacent parts of the face. It commences as a tubercle or tubercles slightly raised above the surface of a dull-red colour, shining surface, and semitranslucent texture.† Other similar tubercles appear in their immediate neighbourhood, and a congeries or patch of them is thus formed, the whole mass often becoming confluent and presenting a red shining surface some-

* See "Abstract of Paper," by Dr. Thin, read before the Medico-Chirurgical Society of London, in *Lancet* for January 14th, 1875.

† This semitranslucent shining appearance is due to the increased succulence of the tissues associated with dilatation of the capillaries and lymphatics, and also to some amount of œdema following this dilated condition.

what uneven and tuberculated at its edges, which are raised above the surrounding parts. These tubercles give rise to no pain or irritation, and may remain almost stationary for months. Sometimes they present a scaly surface which peels off and is replaced by a new skin having a more cicatricial appearance. The skin gradually assumes a cracked and scaly aspect over the whole patch, and as it separates the surface below becomes more and more flattened and depressed until it ultimately is actually below the normal level of the skin, and in time assumes a white scarlike appearance. Meanwhile new tubercles have been springing up at the outer margins of the patch, and perhaps new ones have formed at a little distance, being separated by healthy skin from the original growth. These new tubercles are generally arranged in a somewhat circular, or semicircular form, spreading as the new crops arise in this form continually repeated, and becoming parts of a larger circle on each occasion.

Diagnosis.—Acne syphiliticum has a certain coarse resemblance to lupus, and leaves depressed cicatrices, but with *dark* coloured stains. It is distinguished chiefly by the hardness of the base of each pustule and by their being widely apart and seldom confluent, and not frequently growing in a crescentic form. But the concomitant conditions will be important means of distinguishing the two diseases. Acne syphiliticum will be associated with other symptoms of constitutional syphilis, such as scars of old ulcers on the forehead, cheeks or palate, scattered acne spots on the cheeks, or stains of ulcers of old acne spots on the same parts; lupus, on the other hand, appears as a merely local manifestation, being commonly confined to the narrow region of the nose and cheeks. There is no associated syphilitic cachexia, and the complexion may remain perfectly bright and ruddy.

*Lupus Exedens.**—In this variety there is the same aggregation of tubercles as in other forms, but as it progresses there is marked ulceration of the central portion, which at first softens,

* The appropriateness of the term employed to describe the ulcerative disease which every now and then makes such ravages in the face has been

then becomes crusted over, and when the crusts separate, presents an indolent form of ulcer. There is less transparency preceding the ulceration than in lupus non-exedens, and the base is harder, giving the ulcerated surface the appearance of being composed of a rotten cheesy deposit. It affects the whole thickness of the skin, and the glandular and hair-forming apparatus, and all the parts involved are destroyed by its ulcerative action, the cartilages and bones of the nose being sometimes ultimately eroded by it in the worst forms, hence distinguished as L. vorax. The entire nose has been seen to be destroyed in less than a month. The excavation of the centre of the growth is bounded by successive new crops of tubercles which form a raised border, varying in height according to the greater or less depth of the erosion. The ulcers, as well as the tubercles, are remarkable for the absence of severe pain.

Diagnosis.—The age of the patient (generally between fifteen and thirty years), the gelatinous aspect of the sore with the continual reproduction of crusts over the surface of the ulcer, the dull red raised edge, and the form of the cicatrices; the absence of any affection of the lymphatic glands, and the often florid, rarely cachectic, look of the patient, together make up a very clear concurrence of diagnostic indications.

From *acne* it differs in the same particulars as in the non-exedent form, and especially in the dull red shining aspect of the marginal tubercles.

Epitheliomatous ulcers have hard everted edges and a prominent fungoid surface, and in the advanced stages the glands become affected. The surface exudes a foul discharge, and crusts are rarely formed over it. This form of disease rarely affects the nose, and when it does, it is seen in elderly people, and there is generally a marked cachexia.

questioned by some of the best authorities on the subject of lupus, and I am inclined to agree with them that in almost every case of so-called lupus exedens there is either constitutional syphilis or struma as an important element in the causation of the ulcer. Rodent ulcer may be a better name for some of those which attack the face later in life, but which have also often been classified as lupus exedens.

In Plate V, Fig. 1, is seen an instance of lupus exedens, having a slight superficial resemblance in its local developments to epithelioma. The prominence of the ulcerated surface here was due to the swelling of the parts beneath and around the ulcer, and not to fungoid protrusion of the diseased growth itself. In this respect, the face depicted as Fig. 3 on the same Plate, offers a striking contrast. Here we have a well marked case of ephithelioma with much fungoid protrusion of the ulcerated surface distinctly referable to the morbid growth itself, and not at all due to infiltration of the surrounding parts.

For an instance of rapid and complete destruction of the nose by lupus, I am indebted to Mr. Gascoyen. (See Appendix of Cases, Case LVII.)

Ulcers of *syphilitic* origin are generally associated with tertiary symptoms of the disease elsewhere, and with an earthy cachectic complexion and broken health. The edges of the syphilitic lupoid ulcer is not surrounded by the characteristic soft rounded raised edge peculiar to true lupus; on the contrary, its edges are sharply cut and everted, its surface being foul, dirty, and sloughy, and surrounded by a copper coloured areola. The history of the case is generally conclusive.

Syphilitic acne sometimes assumes an aspect very closely resembling lupus exedens; when, for instance, the acne pimples have become confluent and ulcerated, and especially if caustics have been applied. Separate acne pimples on the neighbouring parts and the existence of other symptoms of constitutional syphilis, such as periosteal nocturnal pains and scars of old ulcers on the face or in the throat or mouth, will sufficiently indicate the true nature of the case. A very good illustration of the distinction between the two diseases is given by Dr. Tilbury Fox. (See Appendix, Case LIX.)

Rodent ulcer is associated with pain; it occurs in old age. It has only a slight tendency to healing, and its course is very chronic.

The Causes of lupus are not very clearly defined. It is seen most frequently during the period of life between fifteen and

thirty-five years of age, and in persons of tuberculous tendencies, and sometimes in phthisical subjects. Possibly, it is due to a combination of two or more associated diatheses. "It is more common in the country than in town, and in the female than in the male sex. Devergie found that twenty-five out of forty-seven cases were females, and Hutchinson forty-six out of seventy-four. Its selective seat is the face. In sixteen cases, according to Devergie, out of forty-four cases, the nose was affected; the nose and other parts of the face together in twenty-six cases. It is a disease of the poor rather than of the rich." (Dr. Tilbury Fox, "Diseases of the Skin," p. 372.)

Pathology.—That a morbid deposit resembling granulation tissue is constantly present in some portion of the integument, is acknowledged by all the pathologists who have studied the minute anatomy of lupus. Some difference of opinion, however, exists as to the primary seat of this deposit. According to Rindfleisch, the disease consists essentially of an adenoma of the sudoriferous and sebaceous follicles of the skin, the surrounding structures being secondarily affected (see Plate IV, fig. 2). "The cells of the lupoid tubercle are, on the whole, of small size, and held together by a mucoid cement, and may be called embryonic tissue." In a section, such as that in fig. 2, Plate IV., the gradual transition of the healthy sebaceous gland at *c* into the various stages of disease, as seen in the central portions of the section, is well illustrated. The extreme periphery of the affected surface is marked when seen from the surface by white shining nodules, which correspond to the sebaceous glands in the first stage of degenerative change, accompanied by swelling of the gland tissue. This swelling is due partly to proliferation of the glandular elements, and partly to the fact that the cells, instead of undergoing fatty degeneration, grow large and vesicular, distending the body of the gland even to five times its normal bulk. The proliferation of the corpuscular elements, according to Rindfleisch, begins in the interstitial and capsular connective tissue of the sebaceous and sudoriferous glands, and extends thence into the surrounding

parts, often deeply into the subcutaneous connective tissue along the afferent vessels. In the ulcerative stage, the parenchyma proper of the glands undergoes fatty degeneration, while the intermediate granulation tissue is converted into pus. The little abscesses thus formed burst and discharge their contents, leaving as the result an ulcerated surface.

According to Auspitz, however, in ordinary lupus non-exedens, in an early stage, the corium is the primary seat of the new deposit, which consists of oval cells with a nucleus more or less distinct, and varying in diameter from ·003 to ·005 inches. These cells seem to originate from the connective tissue corpuscles, as held by Virchow.

The subjoined illustration from Dr. Auspitz's work* shows the above-mentioned changes.

Dr. Tilbury Fox (to whom I am indebted for the opportunity of using the woodcut, fig. 20) adopts these views as being more correct in reference to the ordinary forms of lupus. "In cases of lupus, in which the disease consists not so much of tubercles as in a superficial infiltration, Dr. Auspitz noticed that the rete malpighii was increased to twice or three times its normal thickness, its cells having undergone fatty change. The papillæ were filled with the lupus cells, which were especially abundant along the capillary vessels therein, the vessels themselves being dilated and coiled to a marked extent, and surrounded by an increased amount of connective tissue." (Dr. Tilbury Fox, op. cit. p. 372.)

Prognosis.—In the non-ulcerative forms there is a very fair prospect of cure without any serious disfigurement, though a white cicatricial shrinking of the skin will mark the site of the original disease. The ulcerative forms are more obstinate, resist treatment for months or years, and often lead to great permanent disfigurement.

Treatment.—In dealing with the erythematous form of lupus, constitutional remedies are the most important, and the

* Ueber die Zellen-infiltrationen der Lederhant bei Lupus Syphilis und Scrofulose. Wien, 1864.

medicines most in favour are cod liver oil and iodide of iron. In some of those cases in which there is a syphilitic complica-

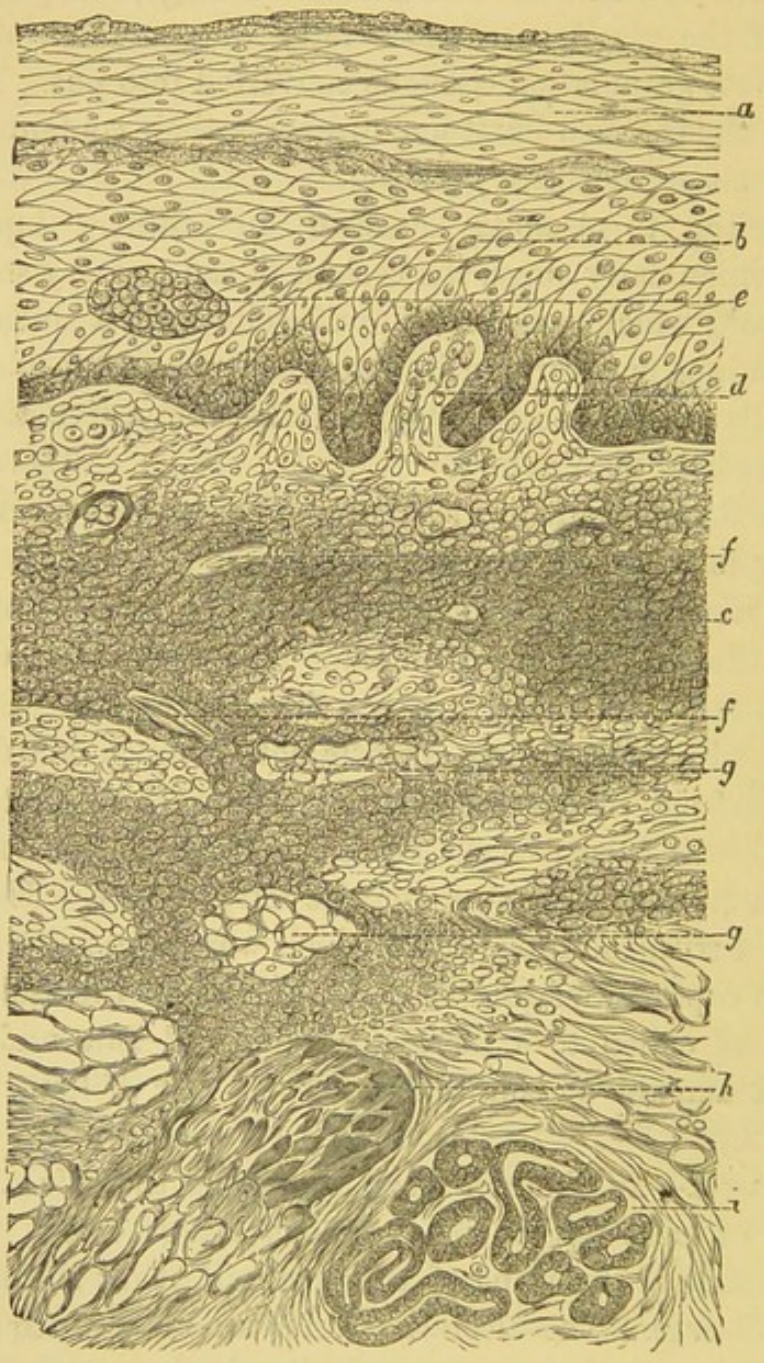


Fig. 20 (*after Auspitz*).

Vertical section through a lupus nodule of the face, treated with dilute acetic acid. × 300. *a*. Horny layer of epidermis. *b*. Rete. *c*. Corium filled with cells of new formation. *d*. Papillary layer. *e*. Transversely-cut papilla. *f*. Transversely-cut vessel of corium. *g*. Transversely-cut connective tissue bundles. *h*. A cut muscle. *i*. A sebaceous gland coil.

tion, iodide of potassium and sarsaparilla are often more efficacious, and in others the biniodide of mercury and arsenic

has been found to succeed after the failure of the other remedies. Locally, caustics are only to be applied to the scaly edges, and only in the form of solutions. A solution of nitrate of silver (gr. x. to f. ʒ i.) applied by means of a camel's-hair brush is very useful. Mr. Erasmus Wilson applies a solution of cantharides in acetic acid, and the compound tincture of iodine.

In the ulcerative forms the solid nitrate of silver or chloride of zinc in the form of paste, or moulded into a stick with sulphate of lime, will be necessary for the purpose of destroying the lupous tissue.

The *caustic* most in favour with Hebra and Kaposi is that known as *Cosme's paste.* The formula for it is ℞. arsenici albi grana decem, cinnabaris factitiæ drachmam semis, unguent rosati unciam semis. The paste is spread on linen to the thickness of the back of a knife. Strips, a finger's breadth in width, are cut off from this and applied to the part, charpie or wadding being placed over them. The dressing is left on for twenty-four hours, and is then renewed with fresh paste on the same plan as before. At the end of the second day the paste is again applied for the third time, as before, and is removed at the end of the third day. The great advantage which attends the use of this paste consists in the fact that the healthy skin is not in the least affected by it, not even excoriated, whilst each individual lupus nodule is invariably and thoroughly destroyed. After three to five days the eschars formed by its use are thrown off by suppuration. ("New Sydenham Society's Translation of Hebra's and Kaposi's 'Diseases of the Skin,'" vol. iv, pp. 101, 102).

Pencils of chloride of zinc are very inconvenient, if used without admixture, on account of their deliquescence and brittleness. The sticks formed after the plan suggested by Kobner and Bruno are to be preferred. They are made by fusing together one part of chloride of zinc; a half, a fifth, or a tenth part of nitrate of potash; a half or a tenth part of chloride of potassium, and moulding into sticks one-and-a-half to two inches long. They should be then wrapped in tin foil and kept

in a well-corked bottle. ("New Sydenham Society's Translation of Hebra and Kaposi's 'Diseases of the Skin,'" p. 108.) Chloride of zinc penetrates quite as readily as nitrate of silver into the lupus nodules, and acts just as slightly on the healthy tissues. It causes less severe, and more transitory, pain than the nitrate (op. cit.).

Volkmann employs a sharp-edged steel spoon for the purpose of scraping away the diseased tissue, and subsequently makes a number of superficial cuts into the raw surface till it bleeds freely. This must be done while the patient is under the influence of an anæsthetic. In a case treated on this plan by Dr. Lichtenberg, the healing of the ulcerated surface took place very rapidly.

The galvano-caustic offers many advantages:—(1) the heat can be regulated to any required degree; (2) the effect can be produced rapidly, and (3) more effectually than with the chemical escharotics. The best forms of instrument for this purpose are those supplied by Messrs. Krohne and Sesemann. The points consist of variously shaped platinum blades, points or cones, or if a large surface is to be attacked, of a cylindrical piece of porcelain, with a spiral coil of platinum passing round it, and connected with the battery by its two ends. According to Neumann, one application of the galvano-caustic is equal to about twenty of the nitrate of silver.

Caustics or other means for the destruction of the diseased tissues should only be employed when the disease is evidently extending, and only to those parts in which the ulcers are most perceptibly advancing. In some cases, however, there are indications for withholding caustics. They are those particularly in which there is great irritability, redness and swelling of the surrounding skin, and excessive tenderness of this irritable part. Under such circumstances soothing applications and poultices should be employed for a time, and caustics used only after the surrounding redness has subsided. In all cases the parts should be carefully excluded from cold air, and in the winter cotton wool should be applied over the other dressing.

The dressing of the ulcerated surface should be non-irritating in most cases. The grey oxide of mercury ointment has appeared to agree well with those cases that have been under my care.

The *lupus erythematodes* of the Germans is associated with a morbid condition of the sebaceous glands in which the neoplastic formation is probably in this variety primarily deposited (see Plate IV, fig. 2). It is thus described by Neumann—"Maculæ or papules (which are at first of a pale red tint, of the size of a pin's head) appear on the skin of the face; in the centre of each papule is the aperture of the hair follicle, which is covered with a thin and closely adherent epidermic scale or greenish crust. By the gradual extension of this efflorescence patches (of the size of a sixpence) are formed, which, at a later stage, involve larger portions of the skin. When the morbid process has lasted for some time, the centre of the patch heals, and the disease extends peripherically, the margin being reddened and elevated; the efflorescence becomes confluent, and on the nose and cheeks the patch assumes the form of a butterfly,—the body being represented by the nose, the wings by the cheeks. In the surrounding parts papules make their appearance, and passing through a similar development, the centre of the efflorescence heals, whilst the disease extends from the periphery. As the patches coalesce the points of contact disappear, and the lupus efflorescence assumes the aspect of tortuous lines. At length the disease may involve the entire skin of the face. In cases in which the affection has lasted several years a cicatrix is formed, which is darkly pigmented, glistening and parchment-like."

The infiltration of the sebaceous glands is, clinically and histologically, the most distinctive feature of lupus erythematodes of the Germans, but it is nevertheless not absolutely characteristic, for Neumann states that he has seen erythematous lupus affecting the palms of the hands; and, as there are no sebaceous glands in this region, he is driven to confess that the affection does not always originate in these structures.

In Fig. 21 (which I am enabled to make use of by the kind-

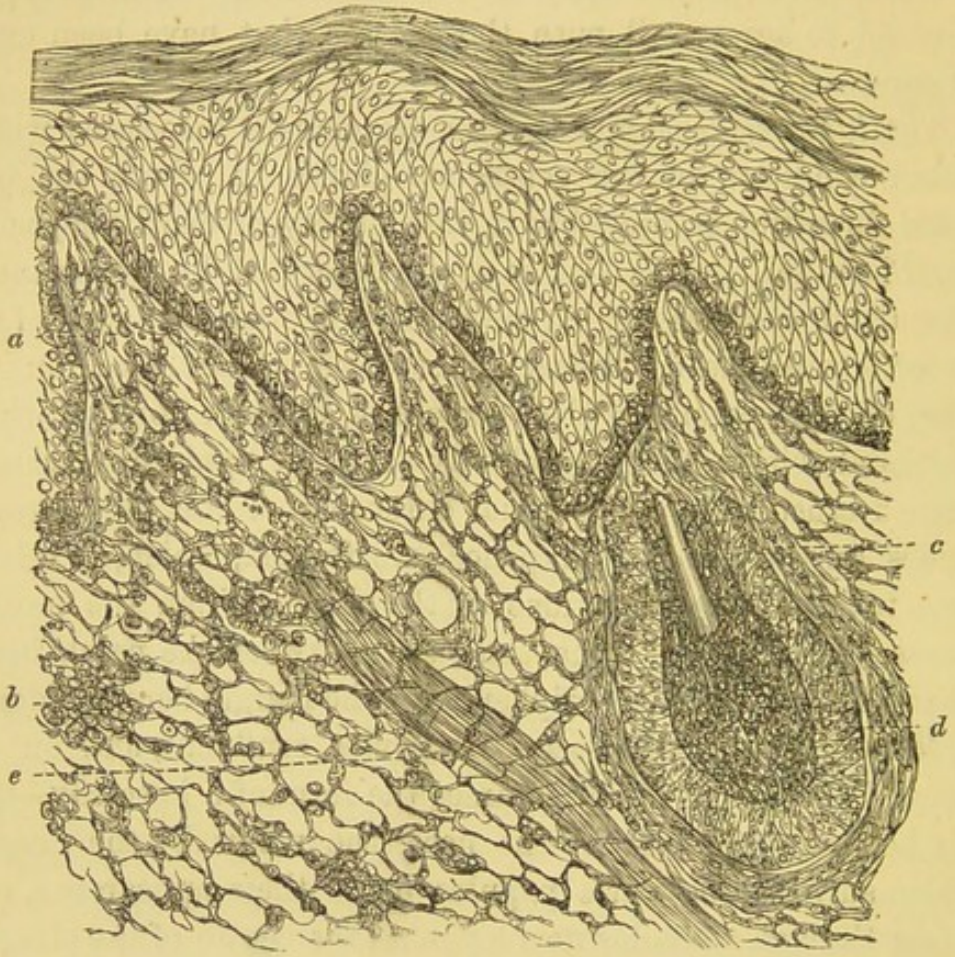


Fig. 21 *(after Neumann.)*

a. Enlarged papilla with cell infiltration. *b*. Accumulation of cells. *c*. Hair cut. *d*. Sebaceous gland with infiltration. *e*. Arrector pili.

ness of Dr. Tilbury Fox) we see that the papillæ are changed in form and much enlarged, that the sebaceous glands are infiltrated and have assumed a globular form, having lost their acinous shape, their excretory ducts becoming obstructed by the altered secretion and the new formation. The glands, thus obstructed and enlarged, are thrust towards the surface, where they are visible to the naked eye as minute yellow deposits, and are soon destroyed by ulceration, their friable contents forming part of the débris discharged from the surface.

Diagnosis.—Acne rosacea, when it occurs in confluent patches, somewhat resembles the lupus erythematodes of the

Germans, but the former differs from the latter by the presence of raised and suppurating pimples or pustules at various parts of the reddened area. The colour of acne, moreover, is brighter and more rosy than that of lupus, and its mode of origin and the ages of the patients affected are very different in the two diseases.

In this form the local *treatment* consists of destruction of the morbid products by means of caustics, but it is not necessary to apply the caustic to the deeper tissues. In slight cases the spiritus saponis alkalinus, and friction with white precipitate ointment may suffice, or potash cream, caustic potash, and corrosive sublimate may be used in concentrated solutions with a similar intention. In obstinate cases the strong corrosive acids may be employed. Internally, cod liver oil, iodide of iron, arsenic and iron, will be most likely to have a beneficial effect on the state of the patient's general health.

The bromo-iodine waters of the Woodhall Spa have been said to have a specific influence over erythematous lupus, when aided by the use of a table-spoonful of lemon juice in milk every morning. Kreuznach waters are also considered by some authorities to have a beneficial effect; but the obstinacy of some cases is such that they resist every method of treatment, and all changes of climate or regimen, so that, as Sir William Gull recently remarked, we are constrained to look upon this disease as one of the opprobria medicinæ.

Closely allied with lupus is the *syphilitic tubercle,* which often attacks the nose and upper lip in the tertiary stage of constitutional syphilis, and in some of the worst cases goes on to ulceration and destruction of all the tissues.

These tubercles are characterised by their livid and coppery tint, by being slow and indolent in their progress, by having a tendency to an annular or serpiginous arrangement, and by the associated syphilitic cachexia.

The tubercles in some instances are of small size, and form rings or circles, and are surmounted by a small thin scale. In other cases the tubercles are more scattered, more irregular in

form, of larger size, and remain indolent and unchanged for months or years. In a third variety the tubercles are surrounded by a copper-coloured areola, and, after becoming inflamed and painful, ulcerate. The ulcer extends deeply, and crusts over from time to time. Portions of the nose and lip thus invaded may become mutilated or destroyed by the deep and broad extension of the ulceration.

In some cases the ulcers assume a serpiginous form, spreading in serpentine lines, or in annulated figures. In others the ulcer takes a linear course across the tubercle, dividing it into two portions, but this is less frequently seen on the nose than the other varieties.

Syphilitic tubercles differ from those of lupus in being more scattered over the face, and not restricted to a group around or on the nose, by their coppery or brownish tint, and by their opacity and want of translucency.

Treatment.—Local is much less important than constitutional treatment in this disease. The iodide of potassium, and a combination of biniodide of mercury with iodide of potassium are the most useful internal remedies in a large majority of cases. But when the cachexia is very marked, cod liver oil and iodide of iron succeed better, especially in ill-fed people such as are often seen in hospital practice. Locally the grey oxide of mercury ointment, and the occasional use of chloride of zinc as a caustic, are well adapted to arrest the progress of the ulcer. Occasionally, the crusts covering the ulcers have to be removed by poulticing before any ointment or lotion can be applied.

Sarsaparilla in the form of liquid extract is sometimes useful in obstinate cases associated with general cachexia. In a few cases of mixed struma and syphilis, the rapid spread of the ulcers into the cartilages and bones of the nostrils has appeared to be arrested by the internal use of arsenic in combination with iron and quinine. In these cases it is very important to keep up the temperature of the whole surface of the body by warm clothing, and especially to protect the nose itself from cold by a

compress of cotton wool, worn whenever there is any chance of undue exposure, or when the weather is severe. Injections of dilute permanganate of potash will be necessary in all cases in which the deeper parts of the nostrils have become ulcerated, and especially when portions of bone have become necrosed or carious.

Whenever there are morbid irritability and nocturnal pains associated with ulceration, opium in some form will be required, sometimes repeated several times in the day, but always given at bedtime in a sufficient dose to procure sleep for four or five hours. Opium often appears to have a specific influence over the serpiginous syphilitic ulcers if given in repeated small doses, and this is hardly attributable to the rest and sleep obtained by its use, but rather to the soothing effect on the whole nervous system, and perhaps the determination of blood to the surface and the consequent checking of the tendency to slow molecular necrosis, which is one striking characteristic of syphilitic ulceration.

Complications of Lupus.—When the cheek is affected simultaneously with the nose, the glands in the sub-maxillary region and certain small glands in front of the ear may become inflamed and suppurate, giving exit to whey-like pus and a cheesy friable material. Sinuses and indurated nodules subsequently form in the region of these abscesses, and give rise to hard, prominent cicatricial lines or nodules. *Erysipelas* sometimes occurs as a complication of lupus erythematodes, even when no caustics have been applied. In lupus vulgaris it rarely occurs spontaneously, but when the health of the patient is favourable to its occurrence, the application of caustics not unfrequently excites erysipelatous inflammation of the neighbouring skin.

Subsection 5.—*Epithelioma. Rodent Ulcer.*

Epithelioma occurs as a disease of the nose occasionally in the form of warty or fungous excrescences, or in the shape of a roundish ulcer, with hard indurated sinuous edges. It may

commence as a hard subcutaneous lump,* which subsequently ulcerates, or as a warty growth, which, in consequence of irritation and scratching, becomes in time an irritable sore, and developes the hard edges and base of epithelioma. There is a tendency in each form to involve the neighbouring tissues in the same kind of growth, and in neglected cases the whole nose becomes a mass of fungoid tissue, which involves besides the nearest parts of the cheek and lip, and extends into the nostrils. A case of this kind from a specimen and cast in Middlesex Hospital is represented in Plate V, fig. 3.

Diagnosis.—It occurs late in life, and this at once distinguishes it from lupus, and the character of the sore is entirely different from that of lupus. There is occasionally some similarity observed between primary, syphilitic and even tertiary syphilitic ulcers and those of epithelial cancer. It is highly improbable that syphilitic sores would occur on the nose, but in the immediate neighbourhood primary and tertiary sores have not unfrequently been observed. The primary indurated chancre is very characteristic, and is distinguished principally by the sharp and defined outline of the indurated base, while the neighbouring lymphatic glands are enlarged and indurated from a very early date. The soft form of chancre and the tertiary syphilitic sore would have less resemblance to epithelial cancer from the absence of an indurated base and edges; and there would, in their case, be enlarged glands in the submaxillary region at an early stage, while, in the case of epithelioma, the glands only become affected in the very latest stage of the disease.

Treatment.—Extirpation of the growth by the knife, caustics, or the actual cautery are the only rational means to be employed for the removal of this disease. The galvanic cautery ecraseur might be used with advantage in the fungoid forms of the disease, such as that represented in Plate V, fig. 3, but in other cases the knife or caustics are preferable. In cases in which the

* An interesting example of this variety is related by Sir James Paget ("Lectures on Surgical Pathology," vol. ii, p. 430).

glands have become diseased, operative interference will not be desirable, and only palliative treatment can be employed.

Rodent Ulcer occupies an intermediate position between the simple fibroid and the cancerous ulcer, some regarding it as a true cancer, others looking upon it as of the nature of fibroid and epitheliomatous disease. It may commence as an irritable wart or pimple, which, as the patient grows old, becomes an almost painless ulcer, and then spreads slowly, until it may, if unchecked, destroy a large portion of the face, including bones and muscles.

The edge of the ulcer is indurated and raised but not undermined and everted. The surface is dry, clean, glossy, and does not exude any large amount of secretion. It does not invade the neighbouring tissues by infiltrating them with deposit, but it slowly eats its way into them. It does not affect the lymphatic glands, nor do similar tumours occur in other parts of the body.

Its microscopic characters are as follows: an excessive growth of fibro-cellular structure, epidermic structures being intermingled with the ordinary subcutaneous tissues, and exudation cells, some of which are flattened and curled together like the globes epidermiques of epithelial cancer.

Mr. Moore (in his work on "Rodent Cancer") inclined to the belief that rodent ulcer is not a fibrous degeneration, but a form of epithelial cancer, composed, however, "of a more feebly vital material."

Continental observers make no distinction between epithelioma and rodent ulcer, but it will be found practically convenient to regard the two diseases as distinct; for the rodent ulcer is different in appearance from that of epithelioma, its edges not being undermined, and it does not affect the lymphatic glands.

Treatment.—Extirpation of the disease by the knife or caustics, or both, is safe and effectual even in the late stages, and should be urgently advised as the only means of giving a chance of cure to the patient.

For instances of successful treatment by these means in cases which would formerly have been considered hopeless, in which the whole nose and adjacent parts of the face had been eroded, leaving in their places huge gaping chasms, I must refer to Mr. Moore's monograph on the subject. It is important in operating to remove the whole of the disease, and to apply caustics to any surfaces from which there is any difficulty in removing the growth by the knife. (See Case LX in the Appendix.)

Subsection 6.

Malignant pustule may be mentioned as an occasional accident in the region of the nose, that part being, in common with other exposed portions of the body, liable to direct inoculation with the specific poison. The disease is clearly traceable to contact with beasts affected with charbon or sang-de-rate. It commences as a vesication filled with a sero-sanguinolent fluid surmounting an indurated boil, this latter being surrounded by an inflammatory areola. The vesicle gives place to a black gangrenous centre encircled by a ring of smaller vesicles. There is severe itching, heat, and pain in the part and low typhoid symptoms. In severe cases the gangrenous part extends rapidly in area and depth, and a large portion of the part affected may undergo mortification. Death sometimes occurs from pyæmic poisoning. In a case communicated to me by Dr. Swift Walker, the nose was attacked, and a portion of the lip and alæ destroyed by gangrenous inflammation. (See Plate IV, fig. 5.)

Treatment consists in early destruction of the affected skin by caustics, such as potassa fusa, followed by the use of carbolic acid or chlorinated lotions, and supporting the strength by tonics and free stimulation. Steel and quinine, or bark and ammonia, are the most appropriate medicines. In a case of supposed commencing pustule the application of strong carbolic acid or glycerine of carbolic acid may have the effect of neutralising the poison and preventing the full development of the gangrenous spot.

Delhi boil, *Aleppo evil*, and *Biskra bouton* appear to be the same disease. It occurs on the face, nose, and hands as a small hard pimple, which, when first seen, has desquamating scales on its top. It increases in size and spreads irregularly by the development of coalescing papules, with some amount of induration and inflammatory swelling of the cutis. Presently scabs form, and an ichorous discharge exudes from beneath them, with ulceration beneath the crusted surface. It is very indolent in its course, and shows no tendency to healing for a long period.

From the researches of Dr. Fleming* it appears that this boil is traceable to inoculation of the discharges from dogs who were found to be subject to ulcers about the nose in Delhi; and he concludes that "Delhi ulcers propagate themselves in various ways amongst individuals or bodies of men principally, if not entirely, by their discharge, which is most contagious when a thick gummy-like exudation appears at the upper part of a sore, or from under a scab just previous to the commencement of ulceration."

In a case of which an illustration is given in Dr. Tilbury Fox's work (p. 243) from a photograph sent by Inspector-General Dr. Murray, of the Indian Service, the whole nose and part of the cheek appear to have been incrusted with scabs, but the hands, arms, legs, and thighs are the parts most commonly affected.

For many years it was supposed that these boils were traceable to some poison or peculiar chemical quality in the drinking water or washing water of the infected districts. The researches of Dr. Fleming, however, seem to show that this view of the causation of the disease is no longer tenable.

The treatment consists in the application of potassa fusa to the ulcerated surface from time to time, and supporting the patient by good living and tonic medicines.

* *Indian Medical Gazette*, Nov., 1869, and "Short Practical Remarks on the Nature, Treatment, &c., of Delhi Ulcers." By J. Fleming, M.D., F.R.C.S., Delhi, 1872.

Subsection 7.—*Nævus. Lipoma. Rhinoscleroma.*

Nævus, as a congenital port wine stain, involves only the superficial capillary network of the cutis. It sometimes affects the nose, with the neighbouring parts of the cheek, in a patch varying in size from that of a shilling to a surface occupying the whole of the cheek and adjacent parts. It is of no importance as far as the health of the individual is concerned; but, being very disfiguring, sometimes needs the skill of the surgeon. It may be destroyed, if of small extent, by the application of strong nitric acid, or by the use of a vesicating ointment of tartar emetic, or lead plaster containing the same material (Empl. Adhœs., ʒii. Antim. Tart., gr. xviii., as recommended by Teissl).

Nævus, involving the cutis vera in its whole extent, is very rarely seen on the nose, but Professor Neumann relates the following case, and it is interesting in many particulars, not least for the successful result of the treatment adopted.

A child two years of age had a vascular nævus involving "the tip and alæ of the nose, in the form of an elevated, multilocular growth, extending even to the nasal mucous membrane. As it was desirable to avoid an operation involving hæmorrhage, or subsequent deformity, I resolved to try the inoculation method; with this view I introduced a considerable quantity of fresh lymph into the deeper tissues of the base of the tumour, making about ten superficial and deep punctures. On the eighth day the pustules were completely developed, and several became confluent; the entire tumour became covered with a crust which was shed spontaneously after the lapse of a month. The child remained under my care for several weeks, when the tumour had considerably decreased in size; and, as its complete disappearance seemed likely to be tedious, I sent the patient home. When I saw the case again, after the lapse of a year, the site of the nævus was indicated only by a few strands of cicatricial tissue."

There are various other methods of treatment which may be adopted in particular cases; of these I give the preference to the needle cautery of Mr. Wordsworth, or the cautery needle

of the galvanic cautery. Injection of nævi with perchloride of iron is sometimes successful, but four or five cases have been published in which death has occurred during the performance of the operation from embolism, or obstruction of the heart by coagulated blood gaining access to its cavities from the seat of the injection. If the actual cautery is not attainable or its use objected to, the ligature will be the best means of dealing with the growth. It is, however, well known that nævi have a tendency to spontaneous cure, and in some cases it will be very desirable to wait for the chance of this taking place before attempting any operation.

Lipoma, so called from the pendulous and lobulated aspect of the growth, consists of an hypertrophic enlargement of all the structures of the alæ and tip of the nose, but does not, as its name would imply, contain any true fat. It is more properly described as a *cutaneous* outgrowth (Paget, "Lectures on Pathology," vol. ii, p. 105), with excess of fibro-cellular tissue and enlargement of the sebaceous glands. In well-marked examples pendulous growths of a blueish red colour, and varying in size from that of a small cob-nut to that of a walnut, with a rounded lobulated surface studded with minute crypt-like depressions, hang from the alæ and tip of the nose, to which they are attached by broad bases or pedicles. They grow slowly and painlessly, and become fully developed at an advanced period of life.

The pathology of this disease is not well understood, but the structure of the parts after removal is that of uniform hypertrophic thickening of the whole of the tissues involved, especially of the cutis and integumental glands, the sebaceous crypts being sometimes distended so as to form cysts as big as a bean. The subcutaneous areolar tissue is also much thickened, and the minute blood-vessels greatly dilated. The disease, therefore, consists of a local fibroma, and in some respects resembles elephantiasis, but with the addition of cystic enlargement of the sebaceous glands. It is possible that in some cases it represents an exaggerated condition of acue rosacea in its later

stages. These tumours, being very unsightly, may be removed without difficulty or danger. The hæmorrhage is somewhat free, but never so abundant as to excite apprehension. In a case operated on by my friend Dr. Swift Walker (see Plate IV, fig. 3) the result, as seen in Plate IV, fig. 4, is eminently satisfactory. Several other instances have come under my notice in which equally good results have been obtained.

In performing the operation for the removal of cutaneous outgrowths, the chief point to be attended to is to preserve the alar cartilages intact. This may be best effected by making an incision down the median line of the nose until the septal cartilage is exposed, then carefully dissecting the growths off the alar cartilages on each side, guiding the incisions by distending the nostril with the forefinger, so avoiding the possibility of cutting too deeply, and by saving as much healthy skin as possible in order to form flaps to cover the exposed cartilages and give sufficient prominence to the tip of the nose.

A layer of cotton wool saturated with styptic colloid forms a very convenient dressing; it is not bulky, and, when dry, makes a kind of case to the parts, and keeps the edges of the flaps well in apposition until union is effected.

Rhinoscleroma.—Hebra has described this disease as a peculiar new formation about the nose, in the *Wiener Medizinische Wochenschrift*, January, 1870. He says:—

To form an idea of it, a substantial syphilitic sclerosis of the prepuce in optima forma, may in imagination be transplanted to the external nasal structures, in one case even to the alæ nasi, and in another to the nasal ridge; to the mucous surfaces which form the borders of the nasal cavity; or lastly, to the skin of the parts surrounding the nose, as the upper lip and forehead. Among nine observed cases there were only two which presented the disease on the nose, cheek, and forehead simultaneously; in the others it was confined to the nose and upper lip alone. As a flat swelling it projected as much as $1\frac{1}{2}$ lines in some places, its extent being always limited by a sharp border with steep edges. The colour of this new formation varied from normal skin colour to a dark reddish brown. The upper surface of the diseased places was always smooth,

Description of Plate IV.

Fig. 1. A specimen of osseous cyst containing a loose tooth, in the possession of Mr. Samuel Cartwright (from Mr. Cattlin's paper on the "Antrum" in the "Transactions of the Odontological Society," 1857-60, p. 38).

Fig. 2. Vertical section of skin affected with lupus, showing the passage of the healthy skin into that which is most infiltrated. *a*, acinous nodules; *b*, embryonic tissue of the lupus nodule; *c*, altered hair sacs and sebaceous glands (after Rindfleisch).

Fig. 3. Portrait of a patient of Dr. J. Swift Walker, with (so-called) lipoma nasi before operation (from a photograph).

Fig. 4. Portrait of the same patient after removal of the tumour (from a photograph).

Fig. 5. A patient of Dr. J. Swift Walker, who had suffered from malignant pustule, ending in destruction of the tip of the nose and portions of both alæ (from a photograph). The disease was contracted by the patient, a farmer in Staffordshire, from one of his own oxen, the body of which he was examining, and which had died while affected with "black quarter."

Fig. 6. Portrait (from a photograph) of the same patient after Dr. Swift Walker had performed a plastic operation by bringing down a flap from the forehead.

Fig 7. A diagram to illustrate the method of plugging the posterior nares for the arrest of epistaxis. A plug at *a*, about to be lodged firmly in the posterior nares by means of the ligature *b*. This having been done, the double ligature *b'* is tied over a plug placed over the orifice of the anterior nares or, if necessary, wedged into them.

Fig. 8. A microscopic drawing, by Dr. John Harley, of a section of a gelatinous polypus of the nostril (× , 320).

Plate. IV.

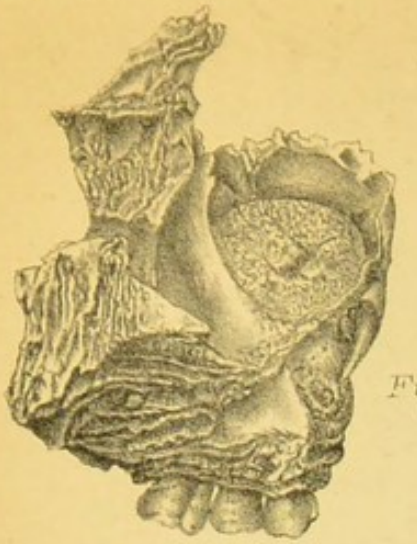


Fig. 1.

Fig. 2.





Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

Fig. 7.

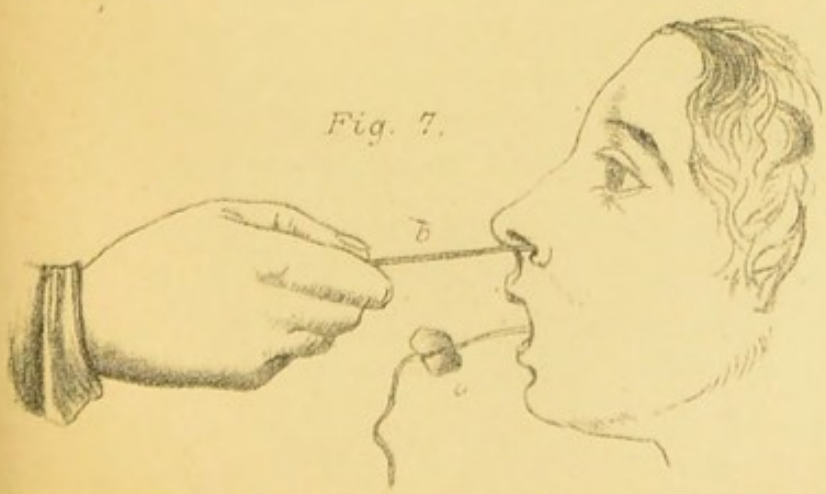


Fig. 8.



X 320

W. West & Co. lith.

rarely shining. The most striking objective symptom consisted in the extraordinarily complete induration of the affected places, which had an almost ivory-like feel. Besides this, the patients experienced but little pain, and only when the formation presented itself localised on the inner surfaces of the nose, and when these prominences were pressed. In all cases the development progressed very slowly, requiring several years before the trouble had acquired dimensions which obliged the patient to seek medical aid.

Characteristics common to all forms of the disease are seen :—

1. In their constant seat on the nose and sometimes in its immediate vicinity.

2. In the extraordinary induration of the affected parts.

3. In the exceedingly slow development of the pathological product, which appears either in the form of brownish-red tubercles or knuckles, or as induration of the normal-appearing tissue.

4. In the sharp margination of these indurations, and the absence of all œdema or inflammatory symptoms in the vicinity.

5. In the absence of all apparent metamorphosis of the new formation, as it neither degenerates, softens, ulcerates, nor is absorbed.

6. In the failure of all internal treatment, even with the strongest agents.

7. In the absence of all danger to the system at large, even in case of its existence for many years.

8. Lastly, in the insensibility and painlessness, when the diseased parts are left untouched ; severe pain, on the contrary, when the dark red tubercles are pressed.

Microscopic examination showed this growth to be "cell infiltration of the upper layers of the corium and the whole papillary body. The normal structure of the affected tissue has thus far suffered by the massively accumulated new formative elements, so that the connective-tissue structure of the papillæ and upper part of the corium is forcibly separated and crowded out, and its elements are renewed. The cells appeared well preserved, with sharp contour, and distinct nucleus, and imbibed carmine well."

A most interesting and exhaustive account of rhinoscleroma appears in the "New Sydenham Society's translation of Dr. Hebra's and Kaposi's work on 'Diseases of the Skin,'" published in the present year (1875). An analysis of the characters of fifteen

cases is there given. "The patients were all in the middle period of life, between 20 and 40, belonged to various nations, and followed very different occupations. No cause can be assigned for the production of the disease." Various *complications* of the disorder are mentioned, such as ulceration of the uvula, perforation of the hard palate, aphonia and laryngeal spasm, a peculiar alteration of the palate and pharynx, &c., but in none of these was there any clue to the constitutional condition of which the local disorder was a manifestation. The changes in the mucous membranes were clearly of the same character as those on the skin. Neither was there any further indication deducible from any of these cases for the successful treatment or cure of the disease. The *diagnosis* depends upon the characteristic hardness and the strict localisation of the growth. Syphilitic nodules, though at first indurated, soon soften and ulcerate, and yield ultimately to appropriate anti-syphilitic remedies, which have no influence whatever upon true rhinoscleroma.

Keloid in the region of the nostrils would present most of the appearances of rhinoscleroma, but, if examined microscopically, would present a fibrous texture essentially different from the cellular infiltration peculiar to this disease. *Epithelioma*, before ulceration has occurred, may have something of the density of rhinoscleroma; but its marginal, transparent, mother-of-pearl-like, vesicular-looking nodules and its general characters will save the attentive observer from making any mistake.

Complete removal of the diseased mass by excision or by caustics seems to have been invariably followed by a recurrence of the growth sooner or later, and even after a plastic operation to fill up the gap left by excision a return of the disease has been known to occur.

Treatment.—No internal remedies appear to have been of any avail. "In two cases," says Hebra, "where the tubercles projected from the inner surfaces of the nostrils into the nasal cavity, and effectually prevented the ingress of air, I have destroyed the tubercles with caustic potassa in substance, and, after separation of the slough, have produced cicatrisation by a

frequent coating with concentrated solution of nitrate of silver (aa part æq.). Compressed sponge was effectual in preventing contraction of the cicatrix. After destruction of the new formation with caustic potassa no regeneration took place, and the neighbouring morbid product was neither disposed to retrograde metamorphosis nor to more rapid development."

Subsection 8.—*Gangrene, Frostbite, Scurvy.*

Gangrene of the tip of the nose may occasionally arise independently of local injury or obstruction. Disease of the internal organs, leading to extreme exhaustion, has in some cases been associated with it. For example, in October, 1874, a patient of Dr. Hardinge's was in the Great Northern Hospital dying from phthisis pulmonalis. A week or ten days before her death a dark bluish-black discoloration made its appearance at the tip of her nose, which, in the course of a few days, spread to the size of a shilling and involved the whole of the tip, but did not extend to the alæ. This was not due to ecchymosis but to venous stasis, and Dr. Hardinge believes that if the patient had lived a few days longer the tip of the nose would have sloughed. He has observed only three or four similar cases in the course of his experience.

The same causes must have operated in a case of which there is a preparation in the College of Surgeons' Museum (No. 1,821), presented by Mr. Swan. A man cut his throat, and suffered so great a loss of blood that the nutrition of one of those parts, to which the blood is sent with most difficulty, became impossible. Before he died his nose sloughed. (Paget, "Lectures on Pathology," vol. i, p. 35).

Frostbite rarely affects any part of the face in healthy persons in this country, or in any temperate climate. The nose and ears are affected with acute inflammation running on to gangrene after prolonged exposure, rarely enough in this country; while in Canada and Russia during the extreme severity of winter, these parts are very frequently destroyed by cold, so that in the former country it is considered imprudent

to venture out of doors when the thermometer is standing below a certain degree.

There are three degrees of frostbite, the first characterised by redness or blueness of the skin, the second by vesication, and the third by gangrene. In the first degree, the nose becomes at first pale and numbed, and pinched or contracted in bulk; after a time, these symptoms pass off, and are succeeded by redness and swelling, with great itching and prickling. This condition, is in fact, the same as that of chilblain. This redness in general passes off without treatment, but it is considered dangerous to apply sudden or great warmth to the part under these circumstances, and in an attack of this kind of frostbite it is better to restore the natural heat of the part very gradually, *e.g.*, by rubbing with snow at first, and then gradually allowing it to be influenced by warmth applied with the hand. The redness, however, may remain permanent, the capillaries never regaining their contractile power, and this is especially likely to occur in frostbites of the nose and ears.

Professor Billroth relates the case of a young man whom he treated without success for a permanently *dark-blue nose*, the result of frostbite. The application of collodion made the organ paler for a time, but gave an unpleasant polish to it, almost as disagreeable as the blue tint; and as the blue tint returned when it was removed, the plan of treatment was abandoned for the application of dilute nitric acid. This produced a yellow discoloration which was also only transitory. Tincture of iodine and nitrate of silver were next tried. The one gave the organ a brownish-red and the other a brownish-black colour. The patient bore all these changes of colour like a hero, but the end of his chequered career was that his nose remained true blue to the last. Professor Billroth thought of trying cold as a last remedy, but, fearing that the patient's condition might be made worse, gave up the project.

In this country and in temperate climates generally, the parts most exposed to cold and in which frostbite is threatened are always of a red colour during the preliminary stage, as it affects the nose, cheek and ears; but in the severe northern

climates, and in intense cold, the part affected by the cold becomes of a pale colour; and it is by this colour that the bystander often warns the person affected of the accident that has befallen him, though he himself is generally unconscious of it, the part being so benumbed by the anæsthetic influence of the cold. This change of colour is accompanied with a stiffness and numbness of the part in which it occurs. Dr. Fletcher (D. J. Thomson, "Lectures on Inflammation," London, 1825, p. 640), who had been physician to the Emperor of Russia, relates "that when a man tells another that he is frozen, he asks whereabouts; and is informed that it is in this place or that, but commonly the nose, the upper part of the cheek, or perhaps the tip of the ear. He then usually rubs it well with snow, and lets it thaw by degrees, else if without that preparation he should go immediately into the stove, he would be in danger of losing his nose or other frozen part."

All authors are agreed as to the danger of rapidly applying warmth when a part has been frozen, and most agree in the advisability of using snow as a local application, with friction, in the first instance.

A case of partial and superficial *gangrene* of the tip of the nose and ear occurred to me at the Great Northern Hospital in the winter of 1874-75. The patient was a delicate girl of eighteen years of age, with all the evidences of cyanosis of congenital origin. Her lips were always of a bluish colour and her complexion correspondingly dull, and tinted by the excess of venous blood circulating in the arterial system. The weather at the time was exceedingly cold, and the small patches of gangrene, one on the upper edge of the concha of the ear and the other on the side of the tip of the nose, were due no doubt to the effects of cold on parts already in a state of very deficient vitality. The treatment consisted in keeping the parts constantly covered with cotton wool and in supporting the system by tonics and improved diet. Under this plan the gangrenous patch did not extend deeper than the superficial layers of the corium, and a very limited area was affected. The case demonstrates the

danger of exposing persons with the languid circulation of cyanosis to severe cold.

When there is complete loss of sensation, with persistent bluish-white discoloration, followed after a few days by vesication and bluish-black discoloration around the vesicle and beneath it, the third degree of frostbite has been reached, and a slough is inevitable. Little can be done by way of treatment. Poultices of linseed meal and powdered charcoal, or lotions of chlorine water, or chloride of lime, or soda, will be the appropriate local applications until the slough separates, and the surface of the stump must be dressed with some mild form of ointment, such as ceratum cetacei or adeps benzoatus, with occasional stimulation by means of lotions of sulphate of zinc or copper. The resulting deformity may generally be remedied by means hereafter to be alluded to under the head of rhinoplastic operations (Section XI., Subsection 3).

Scurvy occasionally gives rise to ulcers of the lips and nostrils. The ulcers in this disease are described by Dr. Buzzard (" Reynolds' System of Medicine") as having edges that are "hard, thick, and shining, and the surface fungoid and bleeding. This kind of ulcer has a tendency to increase rapidly in size and to invade the neighbouring structures. An intolerably offensive odour is emitted from it. Ulcers such as these will often eat their way into the soft tissues with great rapidity, exposing and invading large vascular trunks, from which dangerous hæmorrhage may occur. Sometimes the bones are exposed. * * * When the lips and nostrils are affected the patient presents a ghastly appearance, much like that of an aggravated case of lupus." (See *Edinburgh Monthly Journal*, July, 1847.)

Subsection 9.—*Boils.—Facial Carbuncle.*

Boils on the nose differ from the same disease in other parts chiefly in the greater amount of swelling and discomfort with which they are associated. The ludicrous disfigurement caused

Description of Plate V.

Fig. 1. A case of lupus terebrans, under the care of the late Professor Partridge at King's College Hospital.

Fig. 2. A case of glanders, from a wax cast in King's College Anatomical Museum.

Fig. 3. A wax cast, in the Museum of Middlesex Hospital, from a patient with epithelioma of the nose.

The patient was a woman, æt. 60 years. The museum contains a specimen, in spirit, of the whole of the diseased mass removed after death. The growth occupied the entrance of the nostrils, and extended a short distance within them.

Plate V.



Fig. 1.

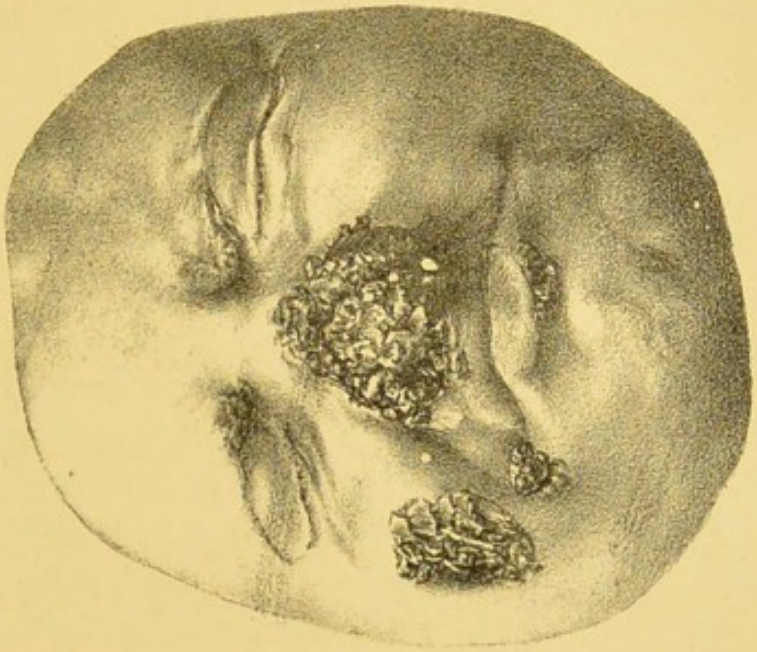


Fig. 2.

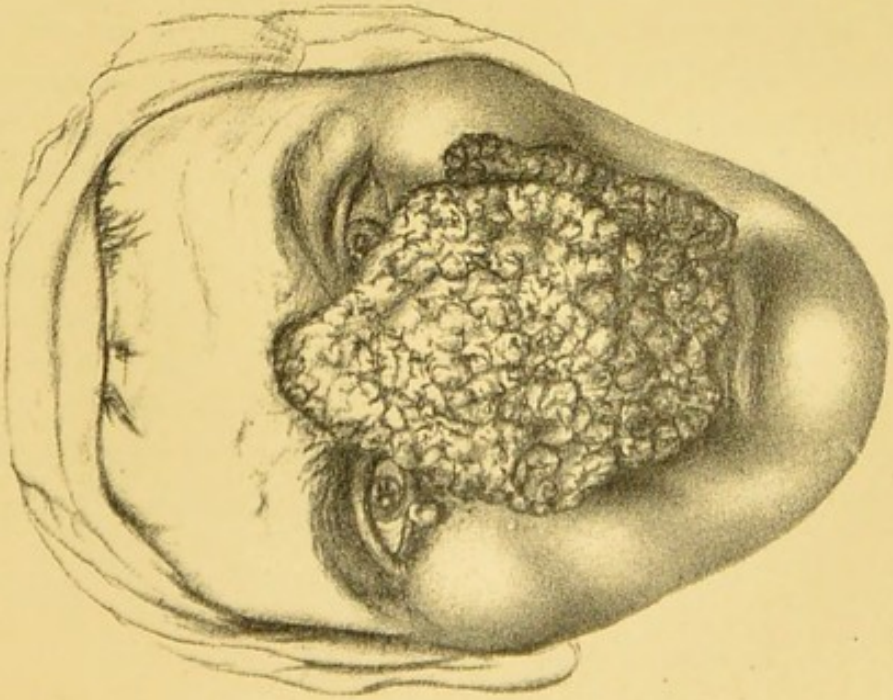


Fig. 3.

W. West & C° lith.

by a boil on or near the tip of the nose makes this ailment, in itself trifling, a source of the greatest annoyance and irritation to patients who have any regard to their personal appearance, and by young ladies especially is looked upon as a most direful calamity, compelling them to give up every sort of engagement for a time. It is often difficult to account for the appearance of boils in this unusual situation, but they are probably excited by the stings of gnats or mosquitoes in many instances, and do not as a rule belong to the same class of disorders as those occurring in the region of the neck, back and nates, of which there is good reason for thinking that some sort of vegetable parasite is the original irritant cause. It is very important to bring about as speedy a cure as possible in all cases, the interruption to business or social engagements being often most seriously inconvenient to the patient. The most effectual way of doing this will be to make a small puncture on the summit of the boil as soon as there is decided pointing of matter, and this opening should be kept open by daily probing. It is *not* desirable to make a large opening, nor to apply caustics, but the frequent application of a camel's-hair brush dipped in carbolised glycerine, will assist in separating any sloughing cellular tissue from the interior. Cotton wool steeped in carbolized oil (1 part of carbolic acid to 20 of olive oil) will be the best local application. Poultices are very difficult to apply and to keep in position. Warm fomentations used frequently are very useful, and prevent any irritation of the surrounding parts, which are very likely to become affected with pimples and boils by a sort of inoculation from the original boil if cleanliness is not strictly enforced. The general health often requires the administration of steel tonics and the regulation of the diet, from which malt liquors and sugar-containing food should be entirely excluded. If there is any difficulty about the escape of the slough from the interior of the boil, it will be expedited by applying a little acid pernitrate of mercury on the point of a glass rod, or, still better, a pointed stick of deal. The dilute nitrate of mercury ointment is a very useful local stimulant and dressing for the later stages

if the granulations are sluggish and the discharge thin and serous.

Carbuncle of a very malignant type, but which is quite distinct from malignant pustule, sometimes attacks the face, and if it involves the upper lip, as it often does, one or both alæ of the nose become indurated and swollen. Sir James Paget related in a clinical lecture, in 1869, that he had met with fifteen cases of facial carbuncle of a malignant kind, and that only one recovered. He considers this form of disease totally distinct from the ordinary carbuncle, and that ordinary carbuncle may attack the face and lip and be free from danger, while the malignant form frequently terminates fatally by pyæmia.

It occurs most frequently in young persons between the ages of fifteen and twenty-two years, coming on with severe pain, often preceded by some pustule or vesicle, and causing much swelling of all the surrounding parts. Fomentations and great cleanliness of the parts are the most important local means, but quinine and iron in large doses must be given internally, and Sir James Paget advises the administration of very large doses of quinine, pushed sufficiently far to produce decided cinchonism. In addition to these remedies a weak solution of sulphurous acid (1 part of the acid: sulphuros: of the British Pharmacopeia to 10 parts of water) should be used as a wash, and syringed into any sinuses or cavities there may be in the carbuncle. By this means we prevent the retention of foul or putrid discharges in contact with the venous channels, the risk of phlebitis and pyæmia is much diminished, and the escape of sloughing portions of cellular tissue is facilitated. The old-fashioned crucial incision is now scarcely ever employed in the treatment of ordinary carbuncle, and is particularly unsuitable for the malignant form of facial carbuncle.

SECTION IX.

Tumours of the Nasal Fossæ, and Naso-Pharyngeal Polypi.

Subsection 1. Fibroma.

„ 2. Sarcoma and Recurrent Fibroid Tumours.

„ 3. Treatment of Fibroma and Sarcoma in the Nasal Fossæ and Naso-Pharyngeal Cavity.

„ 4. Malignant Polypi of the Nasal Fossæ.

„ 5. Bony and Cartilaginous Tumours of the Nasal Fossæ.

Tumours of the Nasal Fossæ, and Naso-Pharyngeal Polypi.

Mucous and Gelatinous Polypi having been already considered (in Section II., Subsection 8), there remain for consideration (1) Fibrous Polypi, (2) Sarcomatous Tumours, (3) Malignant or Carcinomatous Tumours, (4) Osseous and Cartilaginous Tumours. It has been usual to describe naso-pharyngeal polypi as a special and distinct class, and clinically it is often convenient to regard those hard or sarcomatous tumours which present in the pharynx as of a different nature from those originating more anteriorly in the nasal fossæ, and to place the typical instances of naso-pharyngeal polypus in a different class from the ordinary nasal polypi. The fibrous and sarcomatous tumours in this region more often extend, as they grow, towards the pharynx than forwards, and more often occupy the pharynx from the commencement than the nasal fossæ. Nevertheless the presenting part of the tumour being a mere accident of its growth, and the implantation of its pedicle being its most important feature in a surgical point of view, it is better to classify them according to their histological affinities and characteristics rather than to accidental modifications due simply to their position of origin, or the point at which they are most prominent in the course of their growth.

There are certain *symptoms* common to all the varieties of intra-nasal tumours. In the initial stage of the disease we have disagreeable sensations and irritation of the mucous membrane, necessitating the frequent desire to blow the nose, and perhaps a muco-purulent discharge, with occasional hæmorrhages. The respiration is slightly impeded at first, but as the bulk of the

tumour increases, one or both nostrils become completely obstructed, the sense of smell is destroyed on one or both sides, and the voice becomes nasal in character. The next stage is that of distension. The nasal bones are expanded, the antrum encroached upon, the palate depressed, the pharynx obstructed, and deafness produced by irritation of the Eustachian tube. In other cases the orbits are encroached upon and the eyeball displaced, double vision being thereby occasioned. Sometimes respiration and deglutition are both seriously impaired, and in other cases the lachrymal sac becomes obstructed and inflamed, and fistulous openings appear on the cheek. In the very worst and most advanced cases, the whole of the face is hideously disfigured by the expansion of the antral walls and the whole nasal region, severe pains attack the head, the jaws, the eyes, the teeth and the forehead, and in the last stage the brain becomes affected by pressure upon its base, and convulsions and coma usher in the termination of the patient's earthly troubles. This description, however, only applies to the most formidable and neglected kinds, such as a case described by Paletta* of an enormous polypous mass situated in the nasal fossæ and sphenoidal sinuses, which distended the left antrum, expanded the bones of the nose, ulcerated the skin on each side of it, expanded the palate bones, thrust down the palate in its passage into the pharynx, pushed the tongue out of the mouth, and the eyes partially out of the orbits. The adjacent bones were dilated and destroyed, and the polypus itself had an extreme degree of hardness.

Subsection 1.—*Fibroma.*

Any part of the walls of the nasal fossæ and the adjacent region of the pharynx may be the seat of implantation of a fibrous tumour, but the roofs of these cavities are most frequently thus affected, and next in frequency the outer walls of the nasal fossæ, and especially the inferior turbinated bone. It

* "Exerc. Path.," p. 8. Milan, 1820,

is in most cases impossible to decide whether they have originally sprung from the aponeurotic coverings of the bones, or from the periosteum itself, and in many it may be uncertain whether or not the bones have been primarily or only secondarily involved. The naso-pharyngeal polypus is the typical form of fibrous tumour in this region, and may be implanted by a single broad pedicle or by several separate roots springing from the roof of the pharynx or the lateral walls of the posterior nares.

In the course of the discussion at the Paris Chirurgical Society, some years ago, M. Robert asserted that these tumours spring from the foramen lacerum anterius; others declare that they sometimes arise from the whole basilar surface of the sphenoid and occipital bones, and even from the atlas and superior cervical vertebræ, from whence they gradually protrude into the pharynx, nares, &c. Their primary attachment is most commonly by a single broad pedicle from some part of the basilar surface, and the occasional occurrence of several pedicles supporting one tumour is due to ulceration of the opposed surfaces of the tumour and mucous membrane against which they abut; these ulcerated surfaces becoming subsequently united by granulation and cicatrization. They consist of more or less dense tendinous or fibrous tissue, the fibres interlacing in every possible direction, so as to form nodular masses with smooth rounded surfaces.

Symptoms.—The early symptoms are those of obstructive disease in the nostrils, with occasional epistaxis, the origin of which may be overlooked at this period. As the tumour increases in size it is seen or felt projecting into the pharynx as a hard rounded mass, and later on manifests its presence in the nostrils as fleshy looking obstruction visible anteriorily. When the pedicle is attached to the anterior part of the basilar surface, it may be visible in the anterior nares from the commencement or at a very early stage.

As it advances the bones of the nose become flattened and spread out laterally and the orbits invaded, the eyeballs being displaced outwards in proportion to the extent to which these

cavities are affected. In one rare instance recorded by Mr. Prescott Hewett (*Medico-Chirurgical Transactions*, vol. xxxiv, p. 43), the tumour, instead of advancing anteriorly through the nostrils, made its way through the spheno-maxillary fissure into the orbit and the pterygo-maxillary fossa, and ultimately occupied the outer and anterior aspects of the upper jaw, thus giving the appearance of a tumour springing from the antrum. In those cases in which the roof of the nostrils is the original seat of the growth, there is, from an early period, an obstruction in the nostril affected, and the bones of the nose are very soon seen to be displaced. Some displacement of the eyeball is also seen as soon as the cavity of the orbit has become encroached upon.* If one nostril only is occupied by the tumour the septum nasi is gradually pushed over by it to the opposite side, and sometimes, on looking into the mouth, the palate may be seen to be depressed on the side affected. In these cases the tumour may not be visible in the pharynx, and even the finger may fail to reach any projecting tumour in the posterior nares. Posterior rhinoscopy, however, will probably detect the obstruction, and its extent in the backward direction.

Diagnosis.—From gelatinous or mucous polypi fibrous tumours differ, 1st, in their firmer consistence when touched by the finger or probe; 2nd, in their seat of implantation being generally higher up and further back in the first instance; 3rd, in their denser and more opaque aspect when their presenting parts are visible in the anterior or posterior nares; 4th, in their immobility when the patient is told to blow violently through the affected nostril while the other is closed; 5th, in the absence of any changes in their bulk from atmospheric causes; 6th, in their microscopic appearances after removal.

They differ from carcinomatous or recurrent sarcomatous

* A case is mentioned by Velpeau ("Dictionnaire des Trente Volumes," vol. xxii, p. 317) of a fibrous tumour of the pharynx which encroached upon and filled the whole orbit; and M. Gerdy ("Des Polypes," p. 30) relates a case of a fibrous polypus of the nostril and antrum which partly thrust up the floor of the orbit, but was successfully removed by Dupuytren through incisions into the mucous membrane of the mouth. (Case LXXIV in Appendix.)

diseases by their firmness and comparatively slow growth, by the absence of any affection of the lymphatic glands, and by their non-recurrence when completely removed. But this latter point of difference is by no means a reliable means of testing their pathological character, for it often happens that a tumour appears to have been entirely removed, and that a recurrence nevertheless takes place in consequence of some unavoidable incompleteness in the first operation.

Syphilitic Nodes or scrofulous abscesses in the pharynx may simulate fibroma. The history and concomitant conditions will be the chief reliable means of distinguishing the two diseases (see Case LXXV in Appendix). It is only in the very earliest stage of the case that any difficulty can be felt in making a distinction between these two conditions. *Tumours coming from the antrum* may present some of the appearances of the later stages of similar growths springing from the nasal fossæ, but the history of the early stages of the disease will in some measure serve to distinguish it. An antral growth will present at first some tumour on the cheek, and will only secondarily lead to obstruction within the nostril; whereas the fibrous growths in the nasal fossæ cause obstruction in the early stages, and involve the surrounding parts only at the later periods. In the very rare cases in which the pharyngeal growth passes round the posterior aspect of the upper jaw, and ultimately reaches its anterior surface and compresses the antrum, it may be very difficult to make an accurate diagnosis. The rare conditions of the lodgment of foreign bodies (as in the case of a pea having germinated in the nostril), and the impaction of displaced teeth in unusual positions, must be borne in mind in forming our diagnosis; but these sources of error are so rare, and the symptoms likely to be presented so uncertain, that it would be impossible to lay down any definite rules for the purposes of diagnosis in regard to them.

Fractures and displacements of the bones sufficient to cause obstruction of the nares may assume the superficial aspects of a tumour, but the use of the rhinoscope and the probe will soon

enable us to detect the true nature of the obstruction in such cases.

Having satisfied ourselves of the fibrous character of a growth, we have next to ascertain its seat of implantation.

In the early stage the rhinoscope and speculum will enable us to ascertain whether the growth is confined to the nostrils properly so called, or springs from some part of the walls of the pharynx. The exact seat of the growth, if confined to the nostrils, can also be discovered by the same means; using a powerful light and sending a concentrated beam by means of a lens or a concave mirror into the deeper recesses of the rhinal cavity. The use of the probe will also aid us in the same direction. In the later stages distortion of the various parts and the actual protrusion of the growth either anteriorly or posteriorly, or in both directions at once, will give us some evidence of its extent and seat of origin.

The possibility of a tumour which has originated *within the cranium* presenting in the nostrils, and simulating a fibrous nasal polypus, is not altogether imaginary. A very remarkable instance of the kind is cited by M. Gerdy ("Des Polypes," p. 110). A fibrous tumour of the second division of the fifth pair of cranial nerves was mistaken for a nasal polypus, and treated on this supposition by several ineffectual operations, with a fatal result. (Case LXXIII in Appendix.) A very careful consideration of the symptoms in such a case would have given some clue to the origin of the tumour, and in any doubtful case it will always be well to ascertain whether there are any symptoms of intracranial disease, and whether there are any paralytic conditions or loss of sensation in those parts to which the cranial nerves are distributed.

Another singular case illustrating the extreme difficulty of diagnosis is referred to by Cruveilhier. A mass having the appearance of a fibrous polypus occupied the right nostril, and was, on post-mortem examination, found to consist of a portion of dura mater, thickened, exhibiting a fungous surface, and containing within it the corresponding parts of the arachnoid and

pia mater along with some cerebral substance and pus, the whole forming a hernia through the cribriform plate of the ethmoid bone.

A similar case is described as a congenital disease under the name of hydrencephalocele, by Virchow (see Case LXXVIII in Appendix), the tumour in this case penetrating the palate and protruding through the mouth (Virchow, "Die krankhaften Geschwülste," vol. i, p. 185), and the same form of tumour is described as a rhinencephalocele when it presents, as it sometimes has been known to do, at the root of the nose, or in the nasal fossæ. In almost all such cases the congenital origin of the growth will be a sufficient means of diagnosticating the case; pulsations synchronous with the cerebral pulsations and the fluid contents generally recognisable will clear up any doubts remaining in ambiguous cases. Tumours may also arise in dangerous proximity to the brain without actually starting from within the cranium, and in all cases in which there are symptoms indicating an encroachment on the orbitar cavity, such as displacement or protrusion of the eyeball, there is a possibility that the tumour may be attached to the cribriform plate of the ethnoid, or to the parts of the sphenoid in its immediate neighbourhood (see a case by Mr. Cooper Forster, "Clinical Society's Transactions," vol. iv, p. 152). In any case in which the bones of the inner wall of the orbit are involved there is *some* danger in surgical interference, but this is greatly increased when the cribriform plate of the ethmoid is immediately adjacent to the attachment of the polypus, and hence the importance of the diagnosis of such cases. Fibrous polypi differ from the malignant tumours in this neigbourhood, by their comparatively slow growth, and by the absence of severe pain, and a sanguineous or fœtid discharge in the early stages. They are also very generally pedunculated, whereas the malignant growths have a very broad base of attachment, often as large as the free surface of the tumour.

SUBSECTION 2.

Sarcoma and Recurrent Fibroid Tumours spring from the same parts of the nasal fossæ as the fibrous polypi, but they are less commonly seen as naso-pharyngeal polypi. The lardaceous form is generally a degenerated stage of the mucous polypus, having a greyish white, opaque aspect, and very soft and easily-broken texture; their consistence being often like that of very soft cheese. They have some vascularity towards the base, and present vascular points here and there on section. It often happens that after a gelatinous polypus has been removed once or twice, the recurrent polypus assumes the lardaceous opaque condition. Its microscopic characters are then found to have undergone a corresponding change, the embryonic cellular tissue having been replaced by closely aggregated spindle-cells or round cells with little or no intercellular tissue of a fibrous kind. Occasionally the true fleshy sarcoma is the original tumour, and many of the naso-pharyngeal tumours, and the more rapidly growing tumours of the nasal fossæ, are of this kind.

Their consistence and colour vary so much that nothing general can be said about them; they may be as hard as cartilage or of gelatinous, nearly fluid consistence. On incision they may appear bright red, white, yellowish, brown, grey, black, dark red, and different shades of all these colours may appear on the same cut surface, apart from the pigmentation; this variation of colour depends upon their greater or less vascularity, and also the more or less recent extravasations of blood into their tissue. They are attached by one or more broad pedicles. They differ from carcinoma by being distinctly encapsuled in most instances, but in all cases having no tendency to infiltration of the neighbouring parts. The naso-pharyngeal polypi, when not pure fibromata, are of the variety termed fibrosarcoma. They are very vascular, and hence bleed very readily when touched or incised.

Progress.—Left to take their natural course the fibrous and sarcomatous tumours, whether in the nose or pharynx, tend to destruction of the patient by gradually encroaching upon the

adjacent parts, and often by causing absorption of the bones at the base of the cranial cavity and setting up brain mischief. The naso-pharyngeal tumours as they increase in bulk expand the bony palate and form a tumour visible in the mouth, or in rare instances extend into the pterygo-maxillary fossa; while those arising in the nasal fossæ expand the nasal and upper maxillary bones, and displace the contents of the orbits, or even penetrate those cavities after causing absorption of their walls by pressure; sometimes the bridge of the nose is destroyed by ulceration and the tumour presents through the opening. After operations for their removal they are very likely to return in the form of sarcoma of a medullary type, and then softening and ulceration of the diseased mass ensues, with very offensive discharge from the nostrils. Typhoid symptoms or some form of blood-poisoning is soon developed, and the patient generally dies either comatose or after a series of convulsions. If, however, the growth has been removed by an early and effectual operation it is not likely to recur, and the recovery of the patient is permanent.

Diagnosis.—As in the case of fibrous tumours, similar affections of the upper jaw and of the antrum may make their appearance in the nostrils or pharynx, and at a late stage the case will present some of the aspects of a tumour originating in the pharynx. But the same distinctions will be applicable here as in the case of fibrous tumours, though when we are dealing with a rapidly growing sarcoma the stages are much shorter, and the diagnosis will be correspondingly difficult.

The very rare occurrence of sarcomatous tumours originating in the frontal sinus, and ultimately finding their way into the posterior nares and pharynx (see a case in the *Medical and Surgical Journal of Edinburgh*, July, 1826), may complicate the diagnosis. If such a case were seen by the surgeon only at a late stage of the disease it would be difficult to arrive at a true diagnosis, but the history would show that protrusion of the frontal region and encroachment on the walls of the orbit, with more or less displacement of the eyeball, had been early

symptoms in the case, and this would be against the supposition of the disease being originally within the nasal fossæ proper.

Subsection 3.—*Treatment of Fibroma and Sarcoma in the Nasal Fossæ and Naso-Pharyngeal Cavity.*

The first point to be considered is whether any means should be adopted for the removal of the tumour. No operation should be attempted for the removal of tumours evidently coming from the cranial cavity, *i.e.*, in which some symptoms of cerebral disturbance, such as paralysis or anæsthesia of parts supplied by the cranial nerves, are present. Nor, as a general rule, should any operation be attempted when the displacement of the eyeball has been an early symptom in the case; for under such circumstances the tumour is very probably implanted on the bones of the basilar surface near to the cribriform plate of the ethmoid or the orbital plate of the frontal, and any attempt to remove the tumour may cause fatal injury to these parts (see a case by Mr. Cooper Forster, *Clinical Society's Transactions*, vol. iv, p. 159). Those tumours that are evidently connected with nodal swellings elsewhere can only be treated by constitutional remedies. (Cases LXXV and LXXVI in Appendix.)

Under the condition of advanced softening, and perhaps fungous protrusion through ulcerated openings on the cheek, the case is not generally favourable for an operation, but the general health of the patient being good and the glands of the neck being unaffected, an operation may be recommended even under these circumstances. The use of anæsthetics in operations of this kind is attended with much difficulty, and some danger. The free flow of blood into the pharynx, and the possibility of its passing into the larynx in most of the operations, makes it extremely hazardous to produce profound anæsthesia, and if the anæsthetic is given to such an extent only as to cause excitement, the patient becomes unmanageable. Patients who will submit to the operation without an anæsthetic will be in a better position than others.

In some cases the embarrassment and danger of hæmorrhage into the pharynx may be prevented by plugging the posterior nares before commencing the cutting part of the operation. M. Verneuil has operated in this way, and considers the preliminary plugging very useful in many operations on the nose and upper jaw. Whenever possible, the plugging should be performed before the adminstration of chloroform, because the co-operation of the patient is useful. It is obvious that, when the pharynx is occupied by a tumour, the preliminary plugging would either be impossible or very likely to impede rather than facilitate the subsequent steps of the operation.

The great variety of methods of operating testifies to the difficulties experienced in dealing with these tumours.

Fibrous tumours presenting in the nostrils may sometimes be reached by the wire snare forceps or toothed scissors, and removed through the anterior aperture, and they may also be removed in the same way or by ligature when presenting in the pharynx, if with a long and somewhat narrow peduncle; but when they are situated higher up in the nostrils, and are attached by a broad base, it is impossible to remove them without preliminary incisions through the soft parts, and in most instances separation of portions of the bones.

For tumours of this kind Dr. Rouge's operation, already described (Section IV, p. 124), may sometimes be of service. If, after lifting up the face by this method, sufficient space is not obtained, the nasal bone and the nasal process of the superior maxillary of the side affected may be partly detached and turned upwards with the skin-flap: in this way combining the advantages of Rouge's and Langenbeck's operations. Langenbeck's operation is performed as follows :—an incision commenced at the centre of the root of the nose is carried vertically downwards along its ridge till it reaches the lower third, a transverse sweep outwards is then carried along the upper margin of the alar cartilage. The flap thus formed is dissected outwards, and the nasal and superior maxilla exposed, their periosteum, however, being left untouched. The cartilage is now separated by an

incision through its junction with the lower edges of the nasal and nasal process of the superior maxillary. In order to divide the bones at the median junction with those of the opposite side, a saw may be used, or the bone cutting pliers, one blade being passed into the nostril and the other external to it. The nasal process of the superior maxillary is separated from its junction with the body of the bone in the same way by transverse incisions either with the saw or the cutting pliers. By means of an elevator, these bones are separated from their other lateral and posterior attachments, and turned upwards; only their periosteal and mucous coverings then remain to unite them with the frontal. The upper part of the nasal cavity is thus completely laid open, and tumours attached to the basilar surface of the sphenoid can be easily extracted through the aperture thus made.

In those cases in which the tumour is attached to the outer wall of the nasal fossæ either of the above-described operations will give sufficient room for its complete removal. A third method, however, described by Mr. Croft at a recent meeting of the Medical and Chirurgical Society, offers very great advantages whenever the tumour has extended much towards the antrum. Under these circumstances an incision is made along the ala nasi up to the lower part of the nasal process of the superior maxillary bone, and carried thence along the margin of the orbit. The nasal process of the superior maxillary is then cut through with forceps, and the periosteum stripped off the anterior surface of the body of the bone. A piece of bone is removed from this surface, making a window into the antrum. The tumour can then be reached and removed, and the periosteum and skin replaced. The bone is soon regenerated by the periosteal flap, and a less amount of deformity is left than would be expected from the amount of bone necessarily removed.

If, as often happens, the nasal bones are very much expanded and thinned by the pressure of the growth beneath, the upper part of the nasal cavity may be exposed by division of the soft parts along the line of the junction of the ala nasi and cheek, and subsequently cutting through the nasal bone by means

of the bone-cutting pliers, or even in some cases with a pair of strong scissors. (See Cases LXXI and LXXVI in the Appendix.)

The object of these operations being to afford room for the introduction of instruments, the choice of the kind of incision will in a great measure depend upon the size of the tumour and the depth at which its pedicle is attached.

If the pedicle is single, and occupies some portion of the roof or sides of the pharyngeal cavity, and can be clearly defined by exploration with the finger, it is unnecessary to make any preliminary incisions. Under these circumstances, the *wire of the ecraseur* can be passed through the nose into the pharynx, and the neck of the pedicle caught within the loop by manipulation with the finger through the mouth. The wire loop may sometimes be passed more easily round the pedicle through the mouth into the pharynx. Sometimes the tumour has depressed the soft and hard palate, and it can then be reached more easily after making an incision through the palate at the time of the operation for the removal of the tumour (Boutonniere Palatine of Maisonneuve), or through an aperture made in a preliminary operation some days before, as practised by Nelaton. Whichever way is practised, the wire of the ecraseur can be more easily passed round the polypus through the mouth in those cases which are clearly fibrous in texture, and when sarcomatous and soft they may be separated from their attachments by means of the toothed scissors, or even by the finger, without any other instruments. The actual cautery is sometimes useful in checking hæmorrhage after these operations, and when the attachments are very broad it is a means of destroying any portion of the pedicle which has escaped the wire of the ecraseur or the other instruments employed.

In some few instances there is no possibility of exposing and extirpating the tumour without removing the upper jaw or a great portion of it. The orbital plate of the upper maxillary bone can always be left entire in these operations, and in some

cases the alveolar ridge can also be saved. This operation gives a much greater freedom for operating on the deep attachments of the growth, and, by enabling the operator to remove the whole of the base of the pedicle, prevents the liability to a recurrence. A case recently treated by this method was brought before the Clinical Society of London by Mr. Timothy Holmes. (See Case LXXVII in the Appendix.)

Mr. Tatum, of St. George's Hospital, was the first surgeon in this country who removed the upper jaw in order to reach a fibrous tumour attached to the base of the skull. The tumour, which was attached to the sphenoid bone between the two pterygoid processes, was removed easily and without any hæmorrhage; only a small branch of the internal maxillary artery required to be tied. The wounds healed in about ten days, and the patient, a lad aged sixteen years, made a good recovery. (*British Medical Journal*, January, 1868.) The excision of the bone is most readily effected by means of the powerful lever bone-nippers contrived by Mr. Hoffman, formerly of Margate.

In all cases there is a great liability to a recurrence of the disease, and it has been observed over and over again that when a tumour, either of a fibrous or fibroid nature recurs, the recurrent growth is more succulent and sarcomatous in its nature than the primary disease.

The *galvanic ecraseur* has been of late years much employed for fibrous polypi, but the cases to which it is adapted are far from frequent. It is an instrument requiring much nicety of manipulation, and is very cumbrous and troublesome to manage. The principal advantage is that it divides the tissues with a very slight amount of bleeding, but on the other hand it is often so difficult to adjust the wire to the pedicle, that the tumour can only be removed piecemeal. Successive portions are ensnared and divided, and in this way many successive slices can be removed, each slice making more room for subsequent applications. It is also difficult in dealing with deeply-seated pedicles to avoid cauterising the healthy tissues at the same time that the disease is being attacked; but notwithstanding all

these disadvantages, the galvanic ecraseur is becoming daily more and more useful in this department of surgery, and is especially adapted for the removal of tumours accessible from the anterior nares. Dr. Thudichum finds the laminaria in the form of tents introduced into the nostrils, highly useful as a preliminary means of dilating them and allowing the operator to gain a more extended view of the nasal fossæ, as well as a greater amount of space for the introduction of instruments. By this means he has been enabled to remove tumours without preliminary incisions through the soft parts. Dr. Thudichum, though he advocates the use of the galvanic cautery* for fibrous polypi, confesses that they present considerable difficulties, and directs that, when the base of the tumour will not admit of constriction by the loop, a hook is first to be inserted through it, and the loop of the wire passed over the shoulder thus formed. Hardly any mechanical force is then required, and the polypus comes off as if cut with a knife. Dr. Thudichum removed a large polypus of this kind in three slices, there was no bleeding, and the turbinated bone in a few weeks had assumed its normal shape and appearances. (*Lancet*, Sept., 1868.)

This kind of polypus, when situated near the lower orifice of the nostril, may be treated either by the electro-caustic, or by the use of Mr. Gant's scissor-forceps, or by the toothed scissors, and when within easy reach of any one of these instruments there will be little difficulty in dealing with the case. For the treatment of more deeply-seated tumours, and especially the naso-pharyngeal varieties, the cold wire ecraseur or the toothed scissors are more useful and manageable than the galvanic apparatus.

Strangulation by a *ligature* passed round the pedicle is a method difficult to apply in most cases, and only to be preferred whenever the more expeditious proceedings already described cannot be employed. It is also an extremely painful method,

* Middeldorpf's Battery and Apparatus, as supplied by Messrs. Krohne and Sesemann, are the best adapted for this purpose.

and sometimes excites much inflammation and tumefaction of the surrounding parts, and may be attended with a profuse fœtid discharge and dangerous constitutional disturbance. The cure, too, is very slow, and there is a risk of poisoning by the passage of putrid fluids into the stomach. It is claimed on behalf of the ligature that it is not attended by hæmorrhage, but its inconveniences and dangers far outweigh this single advantage.

The simplest way of applying a ligature is to pass a silk thread through the nostril by means of Bellocq's sound (see fig. 8*b*), one end of the thread being left hanging from the nostril and the other from the mouth. To the end hanging from the nostril a noose of catgut or whipcord is fastened, and drawn into the pharynx until it can be seen hanging behind the soft palate; the loop being set free from the thread first passed is now manipulated by the finger passed into the mouth, and hooked round the palate until it is made to embrace the pedicle. A squeeze-knot or running-noose is now made on the ends hanging from the nostril, and constriction effected to the extent required by tightening the squeeze-knot up to the pedicle.

If, however, there is sufficient space in the nostrils to allow the sound to be passed alternately on the two sides of the tumour, the eye of the instrument (Bellocq's) may be threaded with the ligature at first, and passed along the floor of the nostril on the outside of the tumour, the end of the ligature being then drawn through the mouth. The sound is next passed along the nostril a second time inside the tumour and without a thread, but on its extremity presenting in the mouth, its eye is threaded with the end of the ligature already passed, and the loop being held within the mouth during its withdrawal, the ligature will now be in a favourable position for constricting the pedicle as in the first described process.

It is sometimes difficult to keep the noose open on attempting to tighten the knot, the noose slipping to one side and allowing the base of the tumour to escape. Dubois' plan of obviating this difficulty was to slide a segment of elastic

catheter, of very small calibre, and about an inch in length, on the ligature. When the ligature was placed on the pedicle, the piece of catheter being much less flexible than the thread, maintained the noose open. But if, in the attempt to surround the pedicle, the noose slipped over the polypus, he had provided the means of replacing it again, and for this purpose he tied a thread of a different colour round the middle of the piece of catheter, and left it hanging from the mouth. By pulling on this, the ligature was brought back to the root of the polype. As soon as the adjustment of the ligature was considered satisfactory, he could pull the small piece of catheter from off the ligature, and through the meatus. This was effected by pulling another coloured thread which hung out of the nose, and was tied to one end of the piece of catheter. The squeeze-knot was then adjusted as before, and the strangulation effected.

By whatever form of instrument the attachments of the tumour are divided, it is always desirable to finish the operation at one sitting. Sometimes, however, it is impossible, when using a wire ecraseur, to employ an instrument of sufficient strength to allow of complete division of the peduncle; and it may then be necessary to leave the wire-loop attached to it and allow it to cut its way through in the course of two or three days. But after this operation the surgeon must not be surprised if after the wire has passed through the peduncle the tumour remains behind. This has several times occurred, and it is supposed that in these instances the partially divided peduncle has become re-united at the outermost part of the plane of section, while the central part has been undergoing the slow process of division. It is, however, possible that in such a case the tumour has had more than one pedicle originally. (See Case LXXIX in Appendix.)

Subsection 4.—*Malignant Polypi of the Nasal Fossæ.*

True *carcinoma* is described as one of the diseases occurring within the nostrils, but the instances in which the so-called

malignant tumours here met with have been proved to belong histologically to the class of carcinomatous disease are very rare. The recorded cases are for the most part either fibrous or sarcomatous tumours that have undergone some kind of softening and degeneration with perhaps fungous protrusion, or cases of encephaloid disease originating in the meninges, or cranial bones, and making its way through the ethmoid and sphenoid bones into the orbit and nostril.

From a scientific point of view, and, perhaps, in some respects practically, it is important to make a distinction between the mere accidents of ulceration and compression of neighbouring parts arising from the presence of a tumour in itself free from malignant qualities, and those results due, in an early stage of the disease, to the special malignancy of carcinoma.

The following clinical features are attributed to, and supposed to be characteristic of, malignant growths. They are attached to a large surface by a broad base. They are accompanied from the very beginning by severe frontal and rhinal pain. They bleed very easily when touched, and often give rise to spontaneous epistaxis. A fœtid ichorous or sanguineous discharge flows from the nostril at an early stage. The bulk of the tumour increases very rapidly. The glands in the neck are early affected.

Some of these malignant growths are hard, immoveable, and incompressible; others are soft, very vascular and easily broken down, and have the characteristics of encephaloid cancer. They appear to grow always from the bones, and never from the mucous membrane or periosteum. The microscopic appearances differ in no respect from the cancers of the same kind in other parts of the body.

One of the most striking instances of this disease is recorded in the "Catalogue of St. George's Hospital Museum" (Series xvi, 47 and 48). A malignant tumour, described as firm and inelastic, was removed from the left nostril of a child æt. four years. The disease reappeared in various parts of the body, and

the patient died six months after the operation. A vertical antero-posterior section of the nasal cavity, shows it to be filled with a deposit of a malignant nature; the cavity of the antrum is occupied by a similar growth. The zygomatic fossa, the cerebral surface of the frontal bone, the palate bone and the superior maxillary, are all more or less involved in the disease. The body of the sphenoid has been completely absorbed and its position is occupied by part of the tumour, which has penetrated the cribriform plate of the ethmoid in the upward direction. The parts of the dura mater in contact with the disease were much thickened, but the brain was healthy.

This case illustrates the fact that most of the malignant growths in this region are recurrent. In the first instance the disease appeared to be of a fibrous nature, and was attached to outside of the nostril of a healthy child. Sir Benjamin Brodie was the operator in this case, and his diagnostic acumen being so well-known and appreciated, the fact of his not having recognised the malignant nature of the growth demonstrates the great difficulty of arriving at a satisfactory conclusion in such cases.

In the case of a woman sixty years of age under my care at the Royal South London Ophthalmic Hospital in 1871, the early symptoms of the polypus in the nostril were those of simple obstruction with muco-purulent but not offensive discharge. In the course of a few months protrusion of one eyeball and lachrymal abscess and fistula were developed, and I then made an attempt to remove a portion of the polypus, but finding that it bled very readily and had a broad base of attachment, I removed only a very small portion of the disease. On microscopic examination the tumour proved to be of an epithelioid nature, the cells of which it was made up being closely aggregated and presenting great varieties of form as if from very close packing. The tumour increased rapidly after this partial operation, and the pain also became very severe, necessitating the frequent use of opiates. She died within a year from the commencement of the disease.

An exactly parallel case is reported in the Ophthalmic

Hospital Reports (vol. iv, p. 98), and in that instance the tumour was removed twice before any malignant symptoms developed themselves, excepting that very severe hæmorrhage occurred on the first occasion, and about a year after this a slightly tender lymphatic gland of the size of a horse-bean was felt behind the angle of the lower jaw. The tumour removed by the second operation (performed by the late Mr. Moore) was to all appearances a simple sarcoma; nevertheless very shortly after the enlarged gland above alluded to increased in size, softened, and presented a characteristic cancerous ulcer. The orbit also became involved in a similar ulceration, and the patient died nine months after the second operation.

Diagnosis.—The chief points of diagnosis between benign and malignant polypi have been already stated. (See Subsections 1 and 4.) Too much reliance, however, cannot be placed on any of the signs of malignancy, and in the earliest stages an exact diagnosis is sometimes very difficult. Here it will be necessary only to allude to the occasional occurrence in the nostrils of tumours of intracranial origin.

The instance from Cruveilhier's practice under Subsection 1, is also applicable in reference to malignant tumours, but the meningeal cancers (so called) which penetrate the base of the cranium towards the orbit and upper part of the nares, are those most likely to be looked upon as true cancer of the nares.

Out of fifty-one cases of meningeal cancer analysed by Velpeau, seven presented in the orbito-nasal region, and in several of these the tumour presented in the nostrils and caused symptoms commonly referable to malignant polypus.

It might *à priori* have been supposed that intracranial disease would necessarily give rise to symptoms striking enough to call attention to the seat of the mischief; but this is far from being universally the case. Pain in the head for instance may be referred to a particular region, and yet after death a tumour is discovered in a position quite remote from the seat of pain, and tumours have many times been discovered within the

skull without any subjective or objective symptoms during life that in any way raised a suspicion of their presence.

Recently, it is true, the ophthalmoscope has occasionally thrown light on these obscure cases, and in certain instances of so-called optic neuritis discovered by its use the physician has been enabled to diagnosticate intracranial tumour; but it has happened that very serious lesions of nerves, and of most important structures within the skull have given no external sign whatever. Professor Bérard ("Theses de Paris," No. 23, 1826) has related a case in which *the olfactory nerves were destroyed by the pressure of a tumour*, and yet the patient, according to the positive affirmation of the occupants of the beds adjoining his, enjoyed to the last the faculty of smell. This, too, was a case in which the tumour protruded through the ethmoid bone into the nares, and in which the sense of smell might be supposed to have been affected by the presence of the intra-nasal portion of the tumour.

The diagnosis, therefore, on this point must always be very guarded, and too much reliance must not be placed on negative evidence. When positive paralysis or anæsthesia is present the evidence of intracranial lesion is of course very much stronger.

Treatment.—The majority of cases of so-called malignant tumour being only instances of recurrent sarcoma, there is no reason why properly selected cases should not be submitted to operative interference.

Softening of the presenting part of the tumour, and perhaps fungous protrusion through the cheek or the nostril, with considerable distortion of the features and even displacement of the eyeballs, need not forbid the attempt to relieve the patient of a most serious and (if left to itself) fatal disease; but when a tumour has *from the first* grown rapidly and been associated with severe frontal pain and ichorous discharge from the nostrils, and especially if on examination the base is broad and largely adherent to the roof of the nares and pharynx, and bleeds on the slightest touch, no prudent surgeon would think of

meddling with it in the way of operation. Our efforts must be mainly directed to relief of pain and preparing the patient for an euthanasia.

Subsection 5.

Bony and *Cartilaginous Tumours* are occasionally met with in the nostrils, but rarely, if ever, originating from the bones of the nasal fossæ themselves. They spring sometimes from the posterior ethmoidal cells, or the frontal sinuses, and invade all the surrounding cavities in their progress. According to Dr. Thudichum, exostosis of the turbinated bones is an occasional complication of nasal polype (*Lancet*, September, 1868), and he has succeeded in detaching such growths by means of the galvanic cautery wire, the loop of which is heated to whiteness. From my own experience I cannot recommend such a means of attempting the removal of a genuine bony tumour, for though I am satisfied that it is possible to cut through a narrow pedicle of bone by means of this instrument, yet there are great difficulties in the way of doing so, and the wire is very apt to break, when heated to whiteness, if any strain is put upon it during the operation. If, however, the exostosis is attached by a fibrous or cartilaginous pedicle, there is no difficulty in cutting it through by the heated wire, though under such circumstances a pair of scissors would answer equally well or even better.

Several cases of bony tumours occupying the nasal fossa and the adjacent antrum, have been recorded in the "Pathological Transactions," and elsewhere, presenting some of the symptoms of ordinary nasal polypi. Dr. Duka's case ("Pathological Transactions," vol. xviii, p. 256 et seq.) is the best illustration of this rare and curious condition.

A Mahomedan woman, about twenty-six years of age, presented herself with the right side of the face much disfigured by a well marked swelling of the infraorbital region, extending downwards and inwards, both the nose and eye being encroached upon. There was an oozing of muco-purulent fluid from the right nostril; the roof of the mouth was in its normal condition; the difficulty of

breathing through the nose was considerable. On introducing a probe into the nostril, it was stopped in its progress by a hard bone-like structure, which on inspection, presented a rounded blackened extremity about a quarter of an inch from the edge of the ala and septum nasi. Seizing it with the forceps, it appeared quite moveable, as if on a pivot from above downwards, and to a certain extent from side to side, but it resisted all efforts at traction forwards. On laying open the ala nasi, Dr. Duka found that a bony mass occupied the nasal fossa, and was retained in it by its bony walls; he therefore removed the palatine and alveolar portion of the superior maxilla, and succeeded in extracting a mass of compact ivory-like bone, weighing 1,060 grains. This was lying loosely embedded in a cartilaginous deposit, but had no apparent connection with any of the living tissues. It is therefore, impossible, to say whence this tumour originated.

In a somewhat similar case in the "Mémoires de la Société de la Chirurgie de Paris," vol. ii, a bony tumour was removed from the nasal fossa, by M. Michou. This tumour, however, was attached to the orbital plate of the superior maxillary bone, and to the vomer. In such cases as the two above alluded to, and in any case in which the tumour is evidently loose, an attempt to remove it will probably be successful, and free from excessive danger to the life of the patient. In other instances, however, the deep attachments of the bone are to the base of the cranium, and in one case ("Pathological Transactions," vol. xix, p. 311), a portion of the large bony mass, which visibly occupied the orbitar and nasal cavities, was found after death to extend through the sphenoid and ethmoid bones into the middle fossa of the cranial cavity, and to be lying in contact with the under surface of the brain.

Cartilaginous tumours in the orbito-nasal region sometimes cause frightful deformity of the face; and as they are, as a rule, attached to the base of the skull, and parts of them lie in contact with the under surface of the brain, surgery is quite helpless in attempting to relieve the patient.

In a case reported in "Cooper's Surgical Dictionary,"

"The upper part of the nose had been expanded to an enormous

size, while below the left nostril was immensely dilated. The distance between the eyes was more than four inches. * * * After death, a good deal of the tumour was found to be of a cartilaginous consistence, and a portion of it as large as an orange extended within the cranium, where it had annihilated the anterior lobe of the left hemisphere of the brain. Notwithstanding this, till a few hours before his decease, the boy was not comatose, nor insensible. All the surrounding bones had been more or less absorbed, and the place where the excrescence first grew could not be determined."*

* See also a case by Prochaska, "Disquisitio Anatomico-Physiologica Organismi Corporis Humani," p. 172. Vienna, 1812. Translated and cited in Mackenzie, on "Diseases of the Eye," p. 62.

SECTION X.

Injuries of the Nose.

Subsection 1. Contusions and Wounds.

„ 2. Fractures and Dislocations of the Bones of the Nose.

„ 3. Injuries with the Lodgment of Foreign Bodies.

Subsection 1.—*Contusions and Wounds.*

A blow on the nose ordinarily gives rise to nothing worse than a transient epistaxis, easily checked by the application of cold applied externally, or by causing the patient to draw up cold water into the nostril by an inspiratory effort. In the event of this plan not succeeding, pressure of the ala nasi against the septum by the finger commonly stops the flow of blood, the bleeding being frequently from ruptured capillaries on the septum near the junction of the bony with the cartilaginous portion.

In the more severe contusions, the septum is occasionally affected with the peculiar blood-tumour already described in Section IV, pp. 126, et seq.

Incised and lacerated wounds of the nose require no special treatment, the parts being in most cases easily adapted, and uniting well either by first intention, or by primary union.

Incised wounds resulting in partial or total separation of a portion of the nose have often been followed by complete union of the severed part, even after it has been separated from the main portion of the organ for a considerable time. It is a matter of history that Garengeot was scoffed and sneered at for having stated that a portion of the nose that had been completely severed, on being restored to its natural situation, had been made to adhere. In this case, the portion of the nose had been bitten off, and was recovered from a sewer into which it had fallen. That such an adhesion of a separated part is possible is now undisputed, and in any case in which the surgeon should neglect to attempt the readjustment of parts so severed, he would be justly blamed. It is related in Costello's "Cyclopædia of Surgery," vol. iii, p. 231, that a pugilist having bitten off his adversary's nose in a fit of fury, swallowed it. The

surgeon who was called in was blamed for not administering an emetic, in order to recover the severed portion with a view to attempt its re-union. Possibly he might have thought that the piece belonged to the biter by right of conquest. In Carlign's case (recorded in the *Medical Gazette*, 1834, No. 40), the detached portion had been five-and-a-half hours completely separated, yet it united perfectly. It is impossible to say how long after complete severance of the flap the surgeon should give up all hope of re-union: but in any doubtful case it will be wise to give the patient the benefit of the doubt, and after carefully cleansing the detached piece in warm water, and perhaps revivifying the raw surface of the stump by scarification, to adapt the parts and retain them in position by sutures and strapping, or by the application of a layer of cotton wool steeped in styptic colloid, or collodion. It is better, if possible, to avoid the use of sutures, and the styptic colloid offers the advantage of forming when dry a firm crust around the parts, which supports them in position better than any less solid application.

An intimate friend of my own had the misfortune, when a child, to cut off a portion of the end of his nose with a carving-knife. His mother, with great presence of mind, instantly replaced it, and kept it in position by means of a plaster composed of brown paper smeared with soap and sugar. The severed part completely united, and my friend's nose, a rather handsome one, retained its perfect form in adult life, a depressed cicatricial line, scarcely visible to ordinary observation, being the only trace of the injury.

The circulation in parts thus severed and replaced is at first very languid, and sometimes a blueish congested condition is noticed. Under these circumstances it is well to apply a leech to the part, with a view to relieving it of the excess of venous blood stagnating in it and endangering its vitality.

Punctured wounds do not often present any peculiar features in this region. A somewhat singular accident is related by Dr. Garretson (op. cit., p. 495):—

"A young man slipped while standing on a stall in a market-

house. Falling forward and downwards upon one of the hooks, it entered his mouth, breaking off three of his upper teeth, perforating his hard palate, and passing by its point into the right nostril. There was no fracture of bone save a few trifling spiculæ about the circumference of the puncture. The broken teeth were removed, and on the fourth day three small pieces of bone escaped. The wound healed perfectly by the twenty-fourth day."

When, however, the instrument with which the wound is made penetrates the roof of the nostrils, the case becomes complicated by the injury to the cranial contents, and death may possibly ensue. Dr. G. Williamson ("Notes on the Wounded from the Mutiny in India," p. 20) notices a case in which the end of a cane entered the nostril by the left ala, and penetrated the base of the skull immediately below the left optic nerve, carrying before it the left posterior clinoid process. Death followed two days after the accident. The broken extremity of the cane was found in the wound after death.

In *medico-legal inquiries* as to the cause of death, it is sometimes important, in the absence of any external injury, but with evidence of intra-cranial lesions, to search for penetrating wounds of the interior of the nostrils. In the case of young children the cartilaginous condition of the body of sphenoid makes it very possible that a sharp-pointed instrument might find its way into the brain without any external wound, and symptoms of cerebral lesions, with fatal termination in a few days, might come on without any suspicion of injury until the interior of the nostrils had been examined.

Subsection 2.

Fractures of the bones of the nose may be trifling in importance as regards the life of the patient, if the injury does not extend beyond the facial portion of the organ, though they often occasion very considerable distortion from permanent displacement of the fragments. The lachrymal bone is occasionally fractured by direct blows on the nose or edge of the orbit, and

in such cases the ordinary signs of contusion are sometimes accompanied by emphysema of the eyelids and the cellular tissue of the orbit, due to the escape of air from the nostrils through the fractured edges of the bone. These symptoms pass off, as a rule, in the course of a week or ten days under the simplest treatment, the patient being cautioned not to blow his nose until the injured bone has become firmly united; it has sometimes happened, if this precaution has not been observed, that there has been a fresh escape of air into the cellular tissue while the patient has been using his pocket-handkerchief, and a repetition of this accident is very likely to lead to a permanent opening of communication through the lachrymal bone into the cellular tissue of the orbit, and to subsequent occasional attacks of emphysema.

The *nasal bones* are often broken by direct blows of great violence, but the swelling and ecchymosis may make it difficult or impossible at the time of the accident to detect the fracture. If the loose fragments are felt at the time, they should be replaced by passing a director or female catheter into the nostrils and lifting them forwards into their normal position. During the first few days after the injury there is so much swelling and tenderness of the parts, that plugging of the nostril can rarely be endured by the patient, but if the bones be much displaced and show a tendency to falling inwards, an attempt should be made to keep them in position. A plug of cotton wool coated with wax, or a tuft of wax-coated cotton, may be inserted, and replaced after the swelling has subsided by an ivory or vulcanite tube, or by Mr. Adams's ivory plugs (see fig. 23).

When, after all swelling has subsided, the bones are found to retain their normal position, it is better to avoid the use of any plugs whatever, as they cause much discomfort to the patient and are not necessary for the cure.

The displacement upwards of the septum nasi, and with it of the crista galli and cribriform plate of the ethmoid, with or without fracture of the nasal bones, is a most serious injury, the displaced bones being driven into the anterior lobes of the

brain, and attended with hæmorrhage and perhaps escape of cerebral tissue. The symptoms attending such an injury are those of fracture of the base of the skull, and the fracture and displacement of the nasal bones will be of secondary importance, though valuable as an indication of the probable seat and extent of the deep-seated lesion.

Dislocation of both nasal bones backwards is a very rare accident. It cannot occur without fracture or dislocation of the septum, and may be associated with fracture of the cribriform plate of the ethmoid, which would probably be driven upwards into the base of the brain. Such a displacement of the nasal bones can be reduced by passing a curved director up the nostrils and thrusting them forwards, but more force will be required to effect this than in the case of fractures, the displaced bones being locked between the nasal processes of the superior maxillary bones. Once replaced, however, no plugs will be required to keep them in position. In a case now under the care of Mr. Adams, a permanent deformity has resulted from unreduced dislocation of the nasal bones backwards occurring in a young child. In this case there is great prominence of the nasal processes of the superior maxillæ and a consequent widening of the whole nose. (Case LXXA in Appendix.)

Subsection 3.

Injuries with the lodgment of foreign bodies in the nostrils are most frequently the result of gunshot wounds or explosions. The symptoms of obstruction and often an offensive discharge after an injury are not always at once recognised by the surgeon in attendance as diagnostic of the presence of a foreign body. If, however, these symptoms continue for a lengthened period, the use of a probe will generally discover the cause of the obstruction.

Dr. G. Williamson (op. cit.) relates the case of an officer who lived seven years after an injury to the forehead and nose. After death the breech and screw of a fowling-piece were found lodged in

the forehead and nasal cavities. The anterior portion of the right hemisphere of the brain rested on the flat part of the breech, and was only separated from it by a false membrane.

See also a case by Mr. Lawson (Case LXXX in Appendix), in which the foreign body was discovered and removed successfully during the life of the patient.

For the removal of foreign bodies accidentally introduced into the nostrils, the rules of treatment have been already laid down in Section III, Subsection 7.

Burns and *Scalds* of the nose do not require any treatment at all different from that of injuries of a similar kind occurring in other parts of the body. It is well, however, to prevent, if possible, contraction of the orifices of the nostrils during the healing of sores following such injuries, for it is well known that the amount of shrinking in these cases is very considerable. Ivory or vulcanite tubes adapted to the nostrils may succeed in preventing this in some cases; in others a plastic operation will be necessary for the restoration or widening of the aperture; in others no remedies will be of any avail.

SECTION XI.

Malformations, Distortions and Mutilations of the Nose. Rhinoplastic Operations.

Subsection 1. Malformations and Distortions of Congenital Origin, or the Result of Injuries; Broken Nose.

„ 2. Defects and Mutilations due to Disease or Injury, and Mechanical Appliances for their Relief.

„ 3. Rhinoplastic Operations.

Subsection 1.

Congenital defects of the nose are of three kinds—(1) Those of deficiency of the whole or part of the organ; (2) Imperforate nostrils (Atresia narium); (3) Distortions and Fissures; (4) Double Noses. With regard to disproportion of the nose relatively to the other parts of the face surgery has nothing to do.

Absence of the nose or part of its integument is extremely rare, unless we include under this head the cleft extending through the palate and upper jaw, associated with harelip. In this malformation the floor of the nose is almost entirely wanting, and the septum and columna either wanting or displaced forwards together with the intermaxillary portion of the alveolar ridge. In this condition the alæ are flattened and expanded laterally, and the tip of the nose depressed, the abnormal columna projecting downwards and forwards in an unsightly manner, sometimes giving the appearance of a pendulous tumour attached to the under part of the tip of the nose. The treatment of these cases is a part of the surgery of harelip and cleft palate, and does not belong to the subject of the present work. But it is always desirable when operating to utilise the central portion of the lip between the two clefts by turning it upwards, and uniting it to the tip of the nose to form a new columna, which in these cases is always deficient in length and strength; and to this deficiency the depressed tip of the nose, after operations for harelip, is often partly due. When the central portion of the lip is not so much displaced forwards as in the cases alluded to, there is often a depressed state of the point of the nose, which is found to be due to a

deep fold of the cartilaginous septum. This may be corrected by a very simple operation, first described by Dieffenbach. It consists in drawing the tip of the nose to one side by pressing it with the thumb laterally until the fold in the cartilage comes into view; then piercing the septum with a small scalpel, and carrying the incision through the cartilage from the columma upwards as far as the nasal bones. This sets free the tip of the nose, and the wound in the septum must be kept open for some weeks, while lateral pressure is made upon the sides of the nose, by the use of a leaden plate bent over the dorsum. So long as the lateral pressure seems to be required in order to retain the tip of the nose in position, so long must the wound in the cartilage be kept from healing. It will subsequently close up by granulation.

Imperforate nostrils are also extremely rare, and may be remedied by making an incision into the obstructing tissue; the aperture being kept open during cicatrization by plugs, or tubes of vulcanite or ivory. If the obstruction extends deeply into the line of the nostrils, no attempt should be made to overcome it by incisions. Complete absence of the nose and nostrils probably only occurs in cyclopian monsters, such as are rarely seen in museums. In these a rudimentary nose without perforation projects from the middle of the forehead above the single orbitar cavity.

Lateral displacements of congenital origin are not uncommon. The septum alone may be displaced while the columna and ala remain in their normal position, so that on examining one nostril it is found to be obstructed by what at first sight appears to be a polypus or tumour, while the other is seen to have an unusually large capacity. The septum is sometimes set across the nares obliquely, in such a way that one nostril is obstructed below and the other above. Under these circumstances the voice is rendered nasal in character, and respiration is much interfered with, but when only one nostril is obstructed there may be very little, if any, alteration of the voice.

In other cases the nasal bones and alæ are distorted to one or other side, together with the septum. This malformation when slight in degree is not uncommon, and is said to be increased by the habit of blowing the nose with one hand, and so thrusting the organ to the same side. Left-handed people sometimes have the nose inclined to the left.* It is rarely necessary to attempt any means of correcting this obliquity of the nose; but when it is extreme and gives a nasal sound to the voice, if the patient desires it, some prospect of improvement may be anticipated from the following operation and the employment of pressure afterwards.

If the septum is much distorted, the bony and cartilaginous portions may be separated, or the cartilaginous portion forcibly broken by means of Mr. W. Adams's forceps designed expressly for this purpose (see fig. 22).

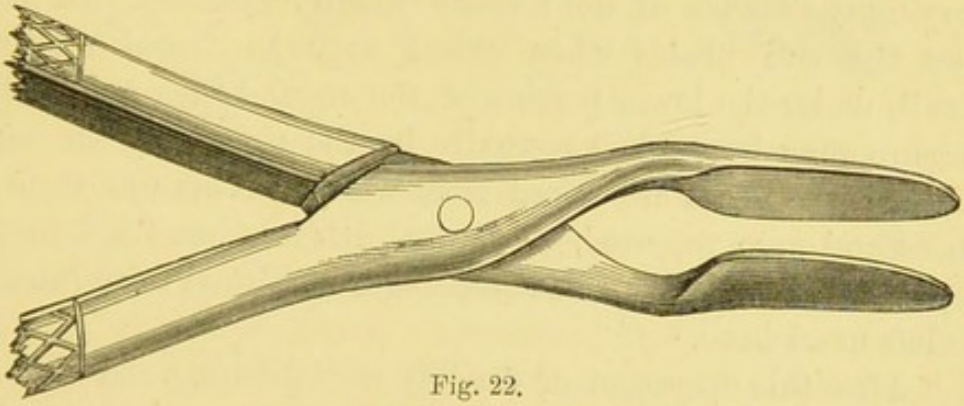


Fig. 22.

Forceps for straightening Septum.

Mr. W. Adams has favoured me with the following account of the principles which have guided him in the treatment of these cases:—

"All cases of so-called *broken nose* may be divided into two classes, viz.:—

"1st. Those in which the injury is limited to the anterior, or cartilaginous portion of the nose, and consists essentially of depression, with lateral bending of the cartilaginous septum, probably also with a partial displacement of this septum from its attachment to the bones; and

* Boyer, "Maladies Chirurgicales," tom. v, p. 48.

"2ndly. Those in which the nasal bones are fractured, with more or less depression, and lateral displacement, in addition to depression and lateral bending of the cartilaginous septum.

"Several examples of both these forms of injury have fallen under my observation in private practice, but all the cases in which I have been consulted, have been at periods varying generally from one to six months after the accident. In one case, however, that of a young lady, eleven years of age, the accident had occurred six years previously in a fall down a sloping bank forty feet in height.

"In all these cases the principle of treatment which I have adopted has been, whilst the patient is under chloroform, to straighten the bent cartilaginous septum with a pair of strong forceps, with flat parallel blades (represented in fig. 22); and, when the nasal bones are depressed, to raise these also by carrying the blades of the forceps directly upwards. In some cases the two blades when closed may be forced up each nostril, under the lower portion of the nasal bones, and lateral pressure may be made externally by the thumb, at the same time that the bones are raised from within. This was done in the second case reported, that of C. R. (see Case LXX in the Appendix), in which sufficient force was employed to re-fracture the left nasal bone.

"After this operation of forcibly straightening the nose, I employ a retentive apparatus, consisting of the steel screw-compressor, represented in fig. 24, which is applied, so as to support the septum, one blade being introduced into each nostril, and the screw tightened just sufficient to hold it in position, and bring the blades in contact with the septum, but without making any pressure upon it. This apparatus can be worn two or three days and nights without removal. After this, I introduce the ivory plugs represented in fig. 23, which the patients can remove at pleasure, and re-introduce, so that both nostrils are kept moderately distended, and support given to the cartilaginous septum.

"It would not be possible to support the nasal bone by any-

thing introduced in the upper part of the nasal cavity, from its small size and the sensitive character of the lining membrane. When the nasal bones have been fractured, I have employed a

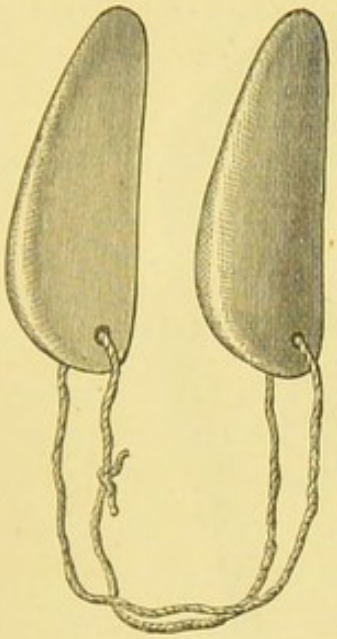


Fig. 23.
Ivory Plugs.

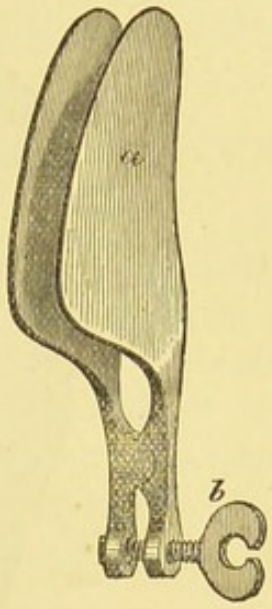


Fig. 24.
Screw Compressor.

retentive apparatus, externally, by means of a pad adjusted by cog-wheels, and attached to the front part of a steel-band passing round the head, forming a kind of nose-truss, if it may be so termed. This apparatus is represented in fig. 25, and was first used in the case of C. R. (see Case LXX in Appendix) and found to answer extremely well. This truss can be worn day and night for two or three weeks, according to the severity of the case. In the case above referred to, it was worn for a still longer period.

"The operation of forcibly straightening the nose does not require to be repeated, except in cases of great severity, but it may, in some instances, have to be repeated once or twice, the retentive apparatus being afterwards employed."*

* An ingenious apparatus devised by a London tradesman, and largely advertised as a "nose machine," consists of two parallel plates of iron, padded inside and curved in such a way that they may be adapted to the sides of the nose. The upper and lower portions of these plates are provided with screws passing horizontally from one plate to the other, and they can by this means be approxi-

Clefts in the alæ, whether of *congenital* or *traumatic* origin, and perforations of any part of the walls of the nose, can be closed by paring the edges of the cleft or aperture, and bring-



Fig. 25.

Nose-fracture Truss for supporting Nasal Bone.

ing them together by harelip pins or wire sutures. Very few examples of *double nose* are recorded. In one case* a little tumour, like a second nose, grew on the root of the principal or normal nose. Pierre Borel† mentions the case of a carpenter who had a double nose, and adds that he was called "the man with two noses," but gives no further details. Whether in such

mated or separated to any required distance. I have had no experience of the value of this contrivance, but can conceive that it might, in some cases, assist in correcting lateral displacements, if the patient could be induced to wear it for a sufficient length of time. It would, however, be useless for the purpose of restoring the central position of the septum, the part mainly determining the direction of the more external bones. It fails to give any *point d'appui*, from which pressure can be effectually made.

* Bartholini, "Hist. Anat." Cent. i, Hist. 25.

† Cent. iii, Obs. 43.

cases any operation for the removal of the superfluous organ is desirable or not, must depend upon the connections of the part. Possibly an *encephalocele* presenting at the root of the nose may have given rise to the idea of a second nose being present, and in such a case no surgical interference would be admissible.

Subsection 2.—*Defects and Mutilations due to Disease or Injury, and Mechanical Appliances for their Relief.*

Disease often destroys the whole of the external parts of the nose, and even of the adjacent parts of the cheek, leaving a most repulsive-looking gap in the middle of the face. The ravages of lupus, syphilitic erosive ulcers, malignant pustule, or frostbite, may be such as to render the patient's life very miserable from the hideous deformity thus produced. But, besides the deformity, the articulation is more or less affected and the sense of smell is lost.

In barbarous times the mutilation of the nose was one of the punishments inflicted on criminals, and this custom survives in the present day in some half-civilised states in the East. These horrible deformities were, therefore, much more common formerly, and the ingenuity of the surgeon was more often exerted for their relief than at the present time.

The loss of the whole or a portion of the nose is sometimes in part remedied by the employment of an artificial substitute made of metal, vulcanite, or some other modification of india-rubber, coloured to imitate the natural skin. This can be fixed on to the sound parts of the face by means of a prominent portion which passes into the gap, and the application of gum to the cheeks where the natural and the artificial parts come in contact; or the artificial member may be fixed to a pair of spectacles which can be worn in the usual way.

There are several mechanicians in London who have made very successful adaptations of artificial noses, and of these perhaps Mr. Stump, of Bolsover Street, has borne off the palm. For the full particulars of his methods of adaptation, and for

the particulars of some excellent results, I must refer to a description in the *British Medical Journal* for April 4th, 1868. He claims to have improved on the hard and stiff noses worn with spectacles, by adapting flexible noses attached without spectacles, and which follow the movements of the face. They are made of a material allied to india-rubber, and are attached to the face by means of collodion or strong gum. (See figs. 26, 27, 28, 29, 30 and 31).

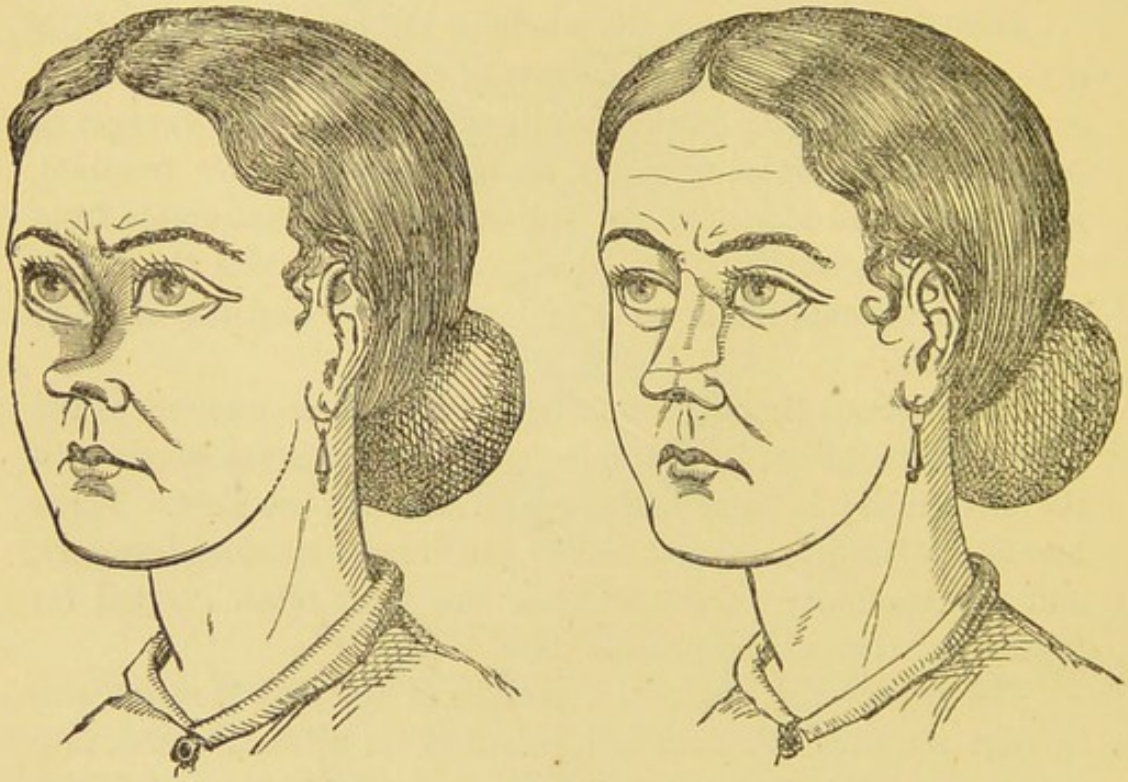


Fig. 26.

Drawing No. 1 represents one of three very similar cases; it is of a young lady who has suffered from hereditary syphilis, which, after raging between the nose and corner of the eye for many years, at last yielded to skilful medical treatment and healed, but leaving an orifice, leading into the head, one inch and a half high by five-eighths of an inch wide; and the contraction of the skin in healing has drawn down the sides of the orifice, the brow, the corner of the eyelid, and the bridge of the nose, giving the girl a frightful profile. Mr. Stump has covered the orifice and made up the bridge of the nose with a piece resting on the tip of the nose, which has remained intact, thereby doing away with the necessity of wearing a black riband tied round the face; it keeps the cold air out of the head, and, coloured to match the complexion of the surrounding parts, it is a vast improvement.

Drawing No. 2 represents a case of entire loss of the nose as a feature; it being from a side view perfectly gone.

In cases in which there is a deficiency in the hard palate as well as loss of the nose, the artificial nose may be attached to an obturator fitted to the aperture in the palate, and the

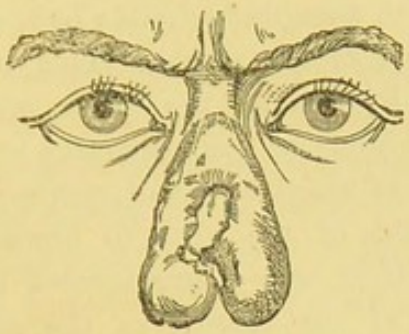


Fig. 27.



Fig. 28.

Drawing No. 3 is of a case in which disease was arrested after the loss of the tip of the nose only, and the falling in of the nostrils consequent on the loss of the support of the septum. We give two drawings (figs. 30 and 31) of the nose made by Mr. Stump suitable for cases Nos. 2 and 3, with this exception, that No. 3 would not require the artificial nose to extend so high, but simply high enough to continue the outline from where it commences to become depressed.



Fig. 29.



Fig. 30.



Fig. 31.

Drawing No. 4 is Case No. 2 fitted with one of Mr. Stump's noses (*British Medical Journal*, April 4th, 1868.)

patient's condition will thus be very materially improved. His articulation and deglutition will be facilitated, and the nose is retained in position without the use of any external support except, perhaps, a pair of spectacles. A very successful case, in which this plan was adopted, is cited in Dr. Garretson's work on "Oral Diseases and Surgery," pp. 672 et seq.

"A young man, aged twenty-six years, had lost by disease the entire external nose, the nasal processes of the superior maxillary bones, and a large portion of their palatine processes. The approximal parts of the palatine plates of the palate and the turbinated bones were also destroyed, but the soft palate, uvula, and tonsils were uninjured * * *. The artificial nose and obturator

were made of vulcanite in two pieces, the larger piece forming the external nose, the septum, and a horizontal plate above the palate, and the second piece occupying the roof of the mouth, and being fitted to the upper piece by means of a staple and slide bolt, which was fastened or released in the roof of the mouth. This was so arranged that the patient could, by passing the finger into the mouth, firmly secure or detach the parts of the apparatus at will. It was afterwards found necessary to adapt a pair of spectacles to the part corresponding to the root of the nose to obviate an unpleasant vibratory movement, which was communicated to the external nose by the movements of the tongue in the acts of deglutition and speech. This apparatus was worn with ease and comfort by the patient."

One remarkable result of the use of these artificial noses is that the sense of smell is to some extent restored. The covering up of the aperture of the nostrils warms the air and retains the moisture of the nasal fossæ; the olfactory region thus regaining two of the conditions essential to the perfection of its functional activity, and for the want of which it had no doubt lost it.

Formerly artificial noses were made of silver, but the metallic nose is decidedly inferior to the india-rubber organ, and it is probable that a still more flesh-like substitute for the original member may in time be discovered.

Patients thus afflicted may, if they prefer it, have a nose of living tissue adapted by means of one of the operations described in the next Subsection.

Subsection 3.—*Rhinoplastic Operations.*

Whenever the gap in the face is due to the original malformation or to injury—provided there are sufficient tissues around it, and the gap is not too large in proportion to the surrounding healthy structures—the prospect of being able to fill it up by a plastic operation is in the highest degree hopeful. But in cases of deficiency resulting from disease there is always the possibility of an unhealthy condition of the parts remaining, and consequently of a defective result or of complete failure. In

any case, whether congenital, traumatic, or morbific in origin, the general health of the patient should be closely enquired into; and all lowering or weakening causes removed before any attempt is made to improve his condition by an operation.

Rhinoplastic surgery dates back from a very early period. In Italy, in the time of Pope Sixtus V, the robbers who infested Rome and its neighbourhood were commonly punished by cutting off the nose. Hence, in this country, the restoration of the nose became a new art, though, from the fact that Celsus,* Galen,† and Paulus Ægineta‡ notice the operations for this purpose, it should rather be described as a revival of a lost or forgotten art.

The history of the Italian method of operating is closely bound up with that of Caspar Tagliacozzi, better known as Taliaciotius. He was Professor of Anatomy at the University of Bologna, and published his celebrated work "De Curtorum Chirurgia per incisionem," &c., in 1597, at Venice; and from the great fame of this work it has been generally supposed that he was the inventor of the Taliacotian or, as it has since been called, the Italian method of nose-making. But from the "Annales" of Pierre de Ranzano, Bishop of Lacera,§ it appears that Branca, a Sicilian surgeon, had performed this operation as early as the year 1442. This surgeon had a son named Antonio, who distinguished himself in the same art. After them appeared in Calabria the family of the Boiani or Vojani,‖ who seem to have transmitted the secret of their method of operating to Tagliacozzi, who immortalized himself by giving it to the world in the work above alluded to. After his death the magistrates of the town of Bologna honoured his memory by a statue, which they placed in the School of Medicine, and for the information of

* "De re Medica," lib. 7, cap. 9.

† Οεραπευτικης μεθοδου βιβλιον τεσσαρεσκαιδεκατον, κεφ, ιστ'.

‡ Pauli Ægineteæ, "De re Medica libri septem," lib. vi, cap. 26.

§ "Annales Mundi," tom. viii. A manuscript in the library of the Dominicans at Palermo.

‖ J. B. Dubois et N. de Vandenesse, "An curtæ nares è Brachio reficiendæ?" Paris, 1742. Eloij, "Dict. Hist. de la Med.," tom. i, p. 358.

future generations represented him as holding a nose in his hand. As the Italian method is now never followed, it would be tedious and superfluous to describe it. It consisted in transplanting a portion of skin from the front of the arm over the biceps to the gap in the face, the arm being kept in close adaptation to the face before complete separation of the flap was effected, by means of a complicated apparatus of bandages, helmet, and jacket.* The whole process occupied a month or six weeks on the lowest computation, and under the most favourable circumstances. But, from the observations of Gabriel Fallopius, who describes† the operation at some length,

* From the well-known lines in Butler's "Hudibras," and also from the following verses of Voltaire's ("Dictionnaire Philosophique," Art. "Prior"), it might be supposed that the new nose was taken from some part of another individual in the original Talicotian operation:—

"Ainsi Taliacotius
Grand Esculape d'Etrurie
Répara tous les nez perdus
Par une nouvelle industrie.
Il vous prenait adroitement
Un morceau du cul d'un pauvre homme,
L'appliquait au nez proprement:
Enfin il arrivait qu'en somme,
Tout juste à la morte du prêteur,
Tombait le nez de l'emprunteur;
Et souvent dans la-même bière,
Par justice et par bon accord,
Ou remettait, au gré du mort,
Le nez auprès de son derrière."

The following lines from "Hudibras" expressed the prevailing ideas in this country with respect to this operation:—

"So learned Taliacotius, from
The brawny part of porter's bum,
Cut supplemental noses, which
Would last as long as parent breech;
But when the time of Noch was out,
Off dropped the sympathetic snout."

Even John Hunter erroneously supposed that "the new nose was transplanted by Tagliacozzi from parts of other individuals and not from the arm of the patient himself" (Hunter "On Inflammation").

† "De Decoratione," Patav. 1566.

it might extend over a much longer period, and he dissuades any mutilated person from submitting to it, on the grounds that it is better to remain disfigured than to undergo torments lasting as long as twelve entire months.

This operation, so tedious in its details and in the time occupied in its performance, was revived in the year 1816 by Graefe, of Berlin, who modified it considerably, and, by adapting the flap from the arm at an earlier stage than in the original operation, shortened the period of time over which the whole proceeding otherwise extended.

Dieffenbach also made an attempt to form a new nose from the arm (see Bushnan's "Translation of Dieffenbach's Surgical Observations on Restoration of the Nose," p. 72, Case V) by an operation resembling that of Tagliacozzi in principle, though it differed in some of its details. He utterly failed, the new nose only partially uniting, and ultimately breaking away altogether in consequence of a sudden change of position of the patient's head during sleep.

The Taliacotian operation and its modifications being dependent on the principle of *remote transplantation,* have, in consequence of their tediousness and difficulties, given place in modern times to the methods of transplantation from *adjacent* parts. Of these, the Indian method, introduced into this country by Mr. Lucas in 1803, and revived by Mr. Carpue in 1814, and afterwards adopted with much success by C. von Graefe, Dieffenbach, Lancy, Lizars, and Liston, is the one most commonly employed, and has been attended with the greatest amount of success in the hands of several living surgeons. Mr. John Wood, Professor of Surgery in King's College and Surgeon of King's College Hospital, to whom I am indebted for many hints on the subject, and whose cases have, on several occasions, been under my observation, has been particularly successful in this branch of surgery, and has introduced several valuable improvements and modifications into the Indian method of operating. Various modifications have also been practised with success by Sir W. Fergusson, Mr. Skey, in

London, and by Messrs. Hamilton, Stokes and Colles of Dublin, and more recently also by Dr. Lichtenberg, of the German Hospital at Dalston.

The Indian method is said to have been in use in the East Indies from time immemorial, the secret of the process having been handed down from father to son in certain families or castes.* In a journal published in Madras in 1794, an account is given of a case of successful nose-making by an artist at Poonah, the patient operated on having been mutilated by the order of Tippoo Sahib. Messrs. James Findlay and Thomas Cruso reported similar operations as having been performed in Bombay by a Mahratta surgeon about the same period. In these operations, the principal flap was taken from the forehead, but two additional flaps were taken from the upper lip to form the alæ.

The first step in the *Indian operation* is to cut out of paper, sticking-plaister, or a thin sheet of wax, a pattern corresponding in size and shape to the intended new nose. This pattern being spread out and laid on the forehead in a reversed position, with

* We may form some idea of the horrible extent to which the amputation of noses and lips was formerly carried in India, and the frequency and urgency therefore of the calls upon human ingenuity to repair the loss so sustained, by the following narrative related by Father Guiseppe of a fact which occurred no longer ago than the year 1769 or 1770 :—" The city of Kirtipoor, in Nepaul, being besieged by the Ghoorka army, was betrayed by one of its nobles. The inhabitants might still have stood on their defence, but on the promise of an amnesty they surrendered themselves prisoners. Two days afterwards Pritwinarayan, the king of Ghoorka, their conqueror, ordered the principal persons of the town to be put to death, and the lips and noses of every one, even the infants who were not found in their mothers' arms, to be cut off, directing at the same time that the lips and noses should be preserved that he might ascertain the number of souls, and that the name of the town should be changed into Nascatapoor, which signifies (such relationships have the languages) Nose-cut-town. The order was carried into execution with every mark of horror and cruelty, none escaping but those who could play upon wind instruments. Many of them, in despair, put an end to their lives ; others came to us in great bodies in search of medicines, and it was most shocking to see so many living people with their teeth and noses resembling the skulls of the dead." Similar instances more recently occurred in the island of Ceylon under Scindeah Rajah. (Bushnan's Introduction to his translation of "Dieffenbach's Surgical Observations," &c., p. 31.)

the part corresponding to the tip, alæ and columna uppermost, the flap is marked in ink with the pattern as a guide, but of dimensions about one-third larger than its actual size. This is necessary, in order to allow for subsequent shrinking of the flap, the borders of which corresponding to the alæ and columna should be well rounded off, and of very ample proportions. No acute angles should be made at any part of the circumference of the transplanted portion of skin; for it has been generally observed that sloughing is apt to occur at any angular projections of a large flap. The shaping out of the nostrils must be left to a subsequent step.

If the height of the forehead is not sufficient to give the necessary length to the flap, a larger one may be obtained by giving it a more oblique position on the forehead, its long diameter being inclined to one side instead of being placed vertically.

These preliminaries having been arranged, and anæsthesia induced, the edges of the gap are made raw by dissecting off the cicatricial tissue to the extent of a quarter-of-an-inch in width all round. The frontal flap is then formed by making an incision through the skin of the forehead in the lines previously marked, and dissected from off the periosteum. Langenbeck* removed the periosteum with the skin, but this can rarely be done with safety or advantage. The dissection being carried down to the root of the nose, a bridge of skin is there left undivided, but the incision on one side is carried down and made continuous with the raw surface prepared for the reception of the flap on the margin of the gap. The flap is then reversed, and adapted to these edges and retained in position by means of sutures. The flap having become firmly united, and its circulation being healthy, the twisted neck at the root of the nose will in most cases form an unsightly prominence, and in order to diminish this, a further operation will be required. In dividing or dissecting off any portion of this part of the flap, care must be taken to save the main channels of its nutrition. The

* "Deutsche Klinik" for 1869.

frontal and superior nasal branches of the ophthalmic artery will be the principal nutrient arteries if the neck of the flap has been taken from above the inner end of the eyebrow, and if the lateral incision towards the nose has been well planned, the angular artery of one side will also have supplied it. In dividing the root or neck of the flap therefore, it is well, if possible, to make incisions as nearly vertical and as much in the median line as possible, and by this means one or all of the arteries mentioned will remain undivided.

This is the simplest form of procedure, but it often fails to give a good result from the absence of any central support to the flap, which in the course of time sinks inwards and presents too flat a surface on the dorsal aspect, and leaves the artificial alæ much distorted. But excellent results may be obtained by this method when the septum or a great portion of it remains. An instance in point is delineated in Plate IV, fig. 5, from the practice of Dr. Swift Walker of Hanley. The patient had lost the tip and some portions of the alæ by the destructive effects of malignant pustule. The flap formed from the forehead was sufficient in this case to fill up the gap completely, and the result is faithfully represented in the figure. (Plate IV, fig. 6.)

In cases, however, in which the septum is completely destroyed, there is no support for the flap brought down from the forehead, and the flattening consequent on subsequent contraction renders the artificial member very imperfect. Under these circumstances Mr. John Wood's operation is more suitable for the worst cases, or those in which the bones as well as the septum are deficient.

In a first operation two different steps are taken with the view to form a central base of support for the frontal flap. In the 1st place two vertical cuts are made through the upper lip, about half-an-inch on each side of the median line, leaving a central portion free below, but attached above at the alveolar arch. The lateral portions of the lip are now brought together by harelip pins and twisted sutures in the usual way. The upturned portion of the lip is split from below upwards, so as to

make the mucous and cutaneous surfaces continuous and facing inwards,* the raw surface looking outwards (see Case VII in the Appendix). By this proceeding the vertical depth of the flap from the lip is nearly doubled. In the next step, the cheeks being dissected from their deep attachment, shaving off all the structures close to the bone, if necessary as far outwards as the malar articulation, the two lateral flaps thus formed are brought together and united in the median line to the upturned lower flap. At the same time long hare lip pins are passed through from the middle of the cheek flaps and across the nasal cavity in such a way as to approximate their edges and lift them well forwards, the cheeks being of course protected by pads from pressure against the ends of the pins.

The base of support being thus formed, the frontal flap is brought down by a subsequent operation after the lateral and lip flaps have become firmly united in their new position, and after a healthy granulating surface has become established in the centre.

The raw part of the upper lip and columna, which is perhaps inevitably left by the process of reversing the central portion, is filled up by transplanting skin-grafts from the arm or some other part of the body. This part of the operation (which is entirely due to Mr. J. Wood's ingenuity), adds very much to the perfection and completeness of the columna. It is a great improvement to the form of the alæ to turn inwards the edges of the sides of the flap from the forehead. This can be best done by a separate operation, and after the flaps have firmly

* An incidental and unexpected advantage was proved to have been gained by this plan in one of Mr. John Wood's cases (reported in the *Medical Times and Gazette* of June 20, 1867). The tip of the nose in this case was found to remain unusually prominent, which was the more remarkable from the circumstance that there is always a tendency in these cases to recession or sinking of the tip. Mr. Wood attributed this fortunate result to the growth of stiff hairs from the deep or skin surface of the recurved central portion of the upper lip. The patient in this instance was an adult fully developed man with a strong moustache.

Similar proceedings were employed in a second case of Mr. Wood's (see Case VII in the Appendix) with very satisfactory results.

united, and in order to allow of this being done a very large flap must be taken. It may at first perhaps appear somewhat too large in consequence of the redundance of the lateral portions. Carefully planned vertical incisions, of a few lines in depth, must be made in order to shape out the margins of the alæ, and the skin surface is then turned inwards towards the cavity of the nostril; the two raw surfaces being kept in contact by a small quilled suture.

The following method of forming the margins of the nostrils was adopted by Dieffenbach with great success, after the union of the frontal flap had been satisfactorily accomplished. In that portion of the skin from the forehead, intended for the columna, he formed on each side a small triangular flap, the apex of which was towards the posterior part of the nostril. It was now reflected forwards and upwards, and, the inside of the nose being previously made raw, the small flap was fixed in its position by a small bent plate of lead, through which a needle was passed, transfixing the flap, and coming out on the ridge of the nose; it was here passed through another leaden plate, and its point twisted to retain all in their proper situations. Wire and small quilled sutures would answer the same purpose equally well.

Instead of taking a flap from the forehead, Dieffenbach, in three cases at least, took it *from the scalp*. In one only of these three was the operation satisfactory, and for some time it was covered with hairs, which were plucked out as they grew. In another case, in which a portion of the scalp was brought down to form the columna, the main portion of the flap being from the forehead, the part lost its hair after fourteen days, and there was no return of it. Mr. Brudenell Carter recently related, at the Medical Society of London, that he had on one occasion transplanted a portion of the scalp for the purpose of making an artificial nose, and that the only drawback to the complete success of the operation was the appearance of a tuft of hairs at the end of the patient's nose, which could only be got rid of by the use of depilatory embrocations. If the flap is taken from the

scalp there is a much smaller wound in the forehead, and the consequent disfigurement is much less; but it is a question whether the tuft of hairs, possibly not easily removable, at the tip or indeed over a large portion of the new nose would not be an equally disfiguring and embarrassing result of the operation. Mr. John Wood informs me that in one of his rhinoplastic cases the patient was somewhat inconvenienced by the growth of hair from the columna, brought down from the scalp at the extremity of the frontal flap. It was necessary, in that case, to destroy the hair-bulbs by the application of nitric acid to each hair-sac separately. Hence, it is very undesirable to attempt the restoration of the nose by a flap from the scalp, in spite of Dieffenbach's authority to the contrary. There can be no reason why we should expect the hairs to fall off from a transplanted portion of the scalp any more than they would when inverted into the cavity of the bladder. It is well known that one of the chief difficulties in plastic operations for the cure of extroversion of the bladder, has been the growth of hair within the newly formed cavity from the skin surface of the reversed flaps taken from the abdomen, and hence this operation of taking a flap from the scalp is not to be held up for imitation, the possible advantages being much outweighed by counterbalancing inconveniences.

In cases in which there is a loss of the septum and alæ, but the nasal bones remain, Mr. Francis Mason's operation is very useful as a preliminary to the bringing down of a frontal flap. It is described in the *Lancet* for June 10, 1871, and consists in bringing across the gap two lateral and one superior flap of integument as a base of support for the frontal flap. The lateral flaps are formed from the integuments of the cheek, the operation thus differing entirely from that just described, in which the whole thickness of the tissues down to the bone is dissected off and brought forwards. In Mr. Mason's operation the margins of the gap are left entire, and the incisions for the formation of the lateral flap are made in the sound tissues, about half or three quarters of an inch away from the margin of the

opening. The flaps are dissected from without towards the median line, are turned inwards, so that the skin surface is towards the nostrils, and a raw surface presents externally. The edges of the two lateral flaps are then brought together and united by sutures in the middle. The upper part of the aperture is now filled in by a flap from the skin, covering the nasal bones, which is reversed in a similar way, leaving a raw surface externally. The frontal flap can then be brought down either during the same or in a subsequent operation. In taking the skin flap from the nasal bones it is very important to avoid making the incisions so freely to one side that the angular branch of the facial artery is wounded. This artery, on one or both sides, may be required as the nutrient vessel of the frontal flap.

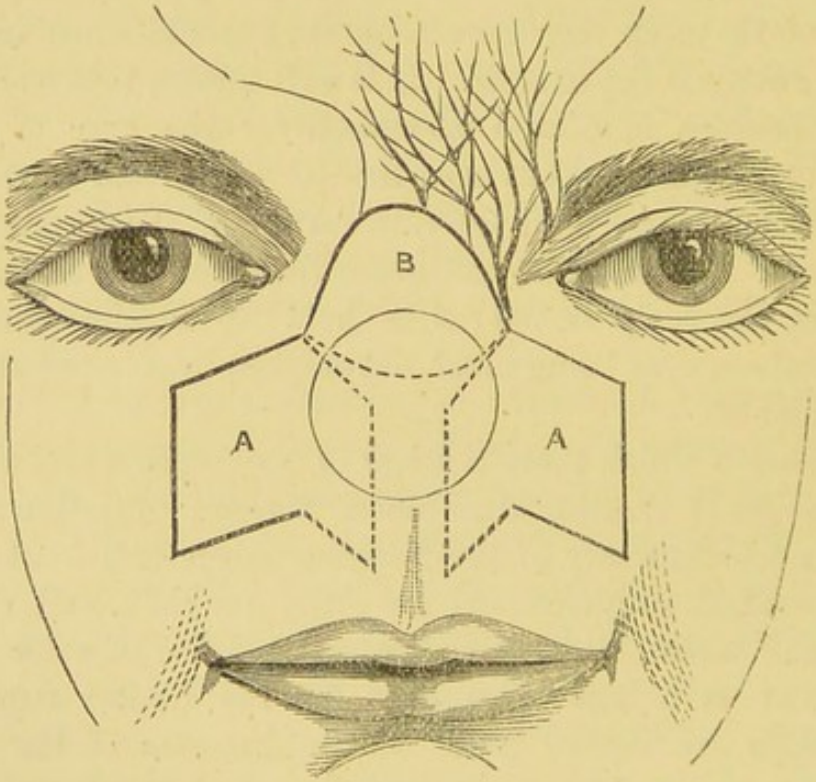


Fig. 32.

A A B The lines of incision in Mr. Mason's operation. A A Lateral flaps. B Upper flap from the bridge of the nose.

The accompanying woodcut illustrates a case in which Mr. Mason operated in the way described. The result was highly satisfactory.

Under the most favourable circumstances, however, and with the greatest skill and care, the results are too often disappointing, so far as the cosmetic effect is concerned. But there is almost always some *improvement* in the patient's appearance, and he also often gains the sense of smell, and improved articulation and distinctness of speech; nevertheless, many persons prefer to have an artificial nose, such as those supplied by the mechanician, and it is often impossible to persuade patients to submit to the prolonged trouble and difficulties of rhinoplastic operations, which are sometimes even followed by fatal results.

In order to prevent the sinking in of the transplanted flap, whether taken from the forehead or cheeks, in cases where the solid framework of the nose has been lost, M. Ollier transplanted the periosteum of the frontal bone with the integuments, and even utilised bone tissue in the form of a flap.*

A young man, aged seventeen years, had lost the whole framework of the nose from congenital syphilis, leaving an excavation in the nasal region, but with the lower portion of the nostrils and the columna untouched, though they were retracted, and instead of being horizontal were turned upwards and forwards. To remedy this, a portion of the bone of the nose still remaining on the right side, and also a portion of the superior maxillary bone of the same side, were transplanted, and a flap of periosteum taken with the integument from the forehead. The osseous flap remained attached to the adjacent bone by means of its periosteum on its outer aspect, and was engrafted into the central portion of the cleft so as to form the point of the nose. It became firmly united in its new position, and the periosteal flap from the forehead also formed a complete union, and in the course of two months and a half had become hardened from ossific deposit. The nostrils became horizontal and widely patulous, and the whole nose was sufficiently prominent and provided with a firm osseous framework such as would prevent any subsequent sinking in of the integument.

This result may be considered highly satisfactory, but the transplantation of periosteum cannot always be safely attempted; the denudation of bone in patients affected with constitutional

* *Gazette des Hôpitaux*, Nov., 1861, p. 538.

syphilis being often followed by necrosis, and this occurring in the region of the forehead may lead to very much worse results than those for the relief of which the operation has been undertaken.

Langenbeck, of Berlin ("Deutsche Klinik," 1859), also transplanted the periosteum of the frontal bone in an operation in 1859, and is therefore the original proposer and practiser of this method.

The formation of a columna from the upper lip may be required as a separate operation in cases in which the tip of the nose is depressed from total or partial loss of the lower part of the septum and columna. Dieffenbach's operation may then be employed. It consists in freeing the central portion of the upper lip by two perpendicular incisions carried up into the nasal cavity from the oral margin. The red labial margin is then made raw by a superficial scarification, and turned upwards and adapted to a raw surface, prepared for its reception, under the tip of nose, where it is united by sutures. The edges of the divided lip, whence the flap has been taken, are united by hare-lip pins. It is not necessary to twist the flap, so that its mucous surface may be directed upwards, and its cuticular aspect downwards. This was thought necessary by Dieffenbach, and was practised by him in his own operations; but experience has shown that the mucous surface soon assumes a cuticular covering when exposed, and that, on the other hand, the skin surface becomes mucous in quality when inverted and constantly moistened by mucous secretions. If the lip be not deep enough for the operation above described, a columna may be made from a horizontal flap out of the lip, or by one taken from the adjacent part of the cheek.

Operations for the restoration of depressed noses.—In cases in which the bony septum and portions or the whole of the nasal bones have been lost, the skin remaining entire, the nose becomes flattened, or even drawn inwards in a concave form, the tip and alæ, however, being still visible below, though much less prominent than in the normal condition.

Under these circumstances, *Dieffenbach's operation* may be performed with advantage.* It consists of the four following stages :—

1*st Stage.*—The central part of the integument covering the depressed ridge, from the frontal bone down to the apertures of the nostrils, is raised by lateral incisions, in the form of a vertical flap attached above but free below.

2*nd Stage.*—Two lateral flaps are formed by incisions in the cheeks of sufficient width below to allow them to be adapted to the central strip in the form of sides and alæ for the new nose. In these flaps the original depressed alæ and the adjacent portions of the cheek are together raised up from the depressed osseous pit into which they had been sunk.

3*rd Stage.*—The margins of these flaps are pared and adapted to one another. And the attached bases of the two lateral flaps are freed still more from the bones in order to allow of their being brought close to the central flap without risk of subsequent contraction.

4*th Stage.*—The edges of the flaps are united by twisted sutures, over entomological pins, or by wire sutures. The new nose is kept forwards during the union of the flaps by two long needles passed under the two alæ and the centre of the bridge, each needle being fastened on the cheeks to leather pads or splints, laid on each side of the nose, and made to press them together. If the columna is altogether wanting, it may be supplied by a subsequent operation from the upper lip, as in the operation already described (see p. 324). My own experience of operations such as the above is by no means favourable. But it is possible that in the cases which have come under my notice the details given by the originator of the method have not been strictly carried out.

The alæ nasi may be formed by flaps taken from the cheek, and, in order to avoid the tendency to closing in of the nostrils (a result very difficult to prevent), the edges of the flap must

* A detailed description is given in "Surgical Observations on the Restoration of the Nose." Translated by J. S. Bushnan, p. 55.

be folded inwards and fixed in that position by sutures. Deficient alæ may also be formed by a modification of the Indian operation by a flap from the forehead, and here also the folding inwards of the edges of the flap will greatly add to the perfection of the resulting nose. For this improvement in rhinoplastic methods surgery is indebted to Dieffenbach, who lays great stress on its importance, asserting that by it alone is the potato-like appearance of the nose, caused by the approximation of the new alæ, to be avoided.

Portions of the lower part of the ridge, or of the lip may be restored by the employment of the frontal flap or by some modification of the Indian method, and in these cases it is generally necessary to split the skin over the nasal bones, and turn aside the skin covering it, in order to form a place of attachment and channels of nutrition for the frontal flap, the size and shape of which must be modified to suit each particular case.

In all the above described operations there is a tendency to contraction of the transplanted flaps, and in the alæ particularly we notice a drawing together of the margins, so that the nose becomes gradually too rounded at the tip and too narrow at its base of attachment to the cheeks. The excessive roundness of the tip may be much reduced by excising portions of the ridge, a little above the tip, of a myrtle-leaf shape, the long diameter being longitudinal, and the deep aspect of the piece excised being broader than the superficial part. Portions of a similar shape, but with the superficial broader than the deep aspect (the wedge being in fact reversed), are next excised from the lateral aspects of the ridge above the alæ. The edges of the wounds are brought accurately together, and when union has taken place a more natural form of the tip and dorsum of the nose will be the result.

In operating for the removal of tumours or cicatrices on the nose, the possibility of subsequent disfigurement should always be borne in mind. By well contrived incisions the nose may be, as it were, *reconstructed* by the same operation by which the

disease part is removed. To effect this, the incisions must be made as nearly vertical in direction as possible, and the diseased growth or scar included between two semi-circular or semi-lunar cuts, which should include a wedge-shaped piece of the cartilage as well as of the soft tissues. In order to allow the divided edges to be brought accurately into apposition, it may be necessary to pare away more of the tissue than is absolutely involved in the disease, and to make the union of the lines of incision at as small an angle as possible. If the disease occupies a large extent, the gap will require a transplanted flap from the forehead or cheek, in order to fill it up satisfactorily, and it will generally be better to do this by a subsequent operation.

Fistulous openings into the accessory cavities, if they cannot be made to heal by the application of the actual cautery to their edges, may be closed by a plastic operation. The first step however, is to prevent the flow of discharges through the fistula, by ensuring a free passage through the natural channel. Lachrymal fistula, for example, will not be successfully dealt with by any plastic operation, unless the free escape of tears and mucus through the nasal duct has been previously ensured by the use of internal probing and the removal of internal obstructions; and fistula of the antrum or frontal sinus will also remain patulous as long as their contained mucous or purulent secretions have no ready outlet through their normal apertures. Though no general rules can be laid down applicable to the treatment of every kind of fistulous opening, it is probable that in most instances an operation of the following kind will be successful. The skin surrounding the aperture having been divided into two or three flaps, the points, or narrowest portions of which meet at the aperture as a centre, and their broadest diameters being most distant, the deep surfaces of two of the opposed flaps are united by quilled sutures, in such a way that a prominent ridge or nodule is left when adhesion has taken place. The third flap, if one has been found necessary, is attached by sutures, above or below the two others by a line of stitches. In a case of fistula into the antrum, operated on by

the author, the closure of the fistula was complete (see Case LX in the Appendix). The prominent nodule of skin can easily be reduced by a trifling subsequent operation.

Causes of failure in Rhinoplastic Operations.—The general health of the patient before the operation is of primary importance. Any trace of syphilitic or other cachexia must be combated by appropriate treatment before attempting any operation. The instances of sloughing of flaps, of imperfect union of transplanted flaps, have occurred in persons suffering from some constitutional disorder, very often from tertiary syphilis. The best results have been obtained in operations to supply deficiencies of traumatic origin in individuals otherwise healthy.

In the operation itself one cause of failure is the division of the principal channels of blood supply at the root of the flaps. In taking flaps from the forehead, it is important to avoid dividing the superior nasal branch of the ophthalmic artery on one or both sides until the main body of the flap is united to the nose. When the gap extends up to the root of the nose on one or both sides, it is better to allow the base of the flap to be sufficiently broad, and to extend sufficiently to one side to allow of retaining the frontal as well as the nasal branch of the ophthalmic artery, and to plan the incisions in such a way that no undue twisting of the neck of the flap becomes necessary in order to adjust it. It may be possible in some cases to allow the neck of the flap to remain permanently undivided, and thus to ensure an enduring and copious blood supply to the flap. This was done in the case above alluded to (*Medical Times and Gazette*, January 29, 1867) very successfully by Mr. John Wood.

If the blood supply is deficient from any of the causes above mentioned, the transplanted flaps are very apt to shrivel, and to assume the appearance of nodular projections stuck on to the face like putty.

The falling inwards of the newly-formed alæ is only to be prevented by taking flaps of sufficient size to allow the skin

margin to be folded inwards, and so thicken and stiffen their walls. At the same time some temporary advantage is derivable from the use of quills, covered with oiled lint, passed into the nostrils, and allowed to remain during the union of the main portion of the flap, the shaping out of the nostrils being deferred to a later operation.

Sloughing of the flap is seldom or never due to engorgement or venous stasis, the fear of which seems to have been the bugbear of the surgeons of the beginning of the century, when it was common to hear that, after a rhinoplastic operation, "a pound and a half of blood was taken from the arm," and "twenty leeches" were applied round the transplanted flap. In one of Dieffenbach's cases, in which there was free arterial bleeding from the flap at the time of operating, hæmorrhage was allowed to go on at intervals from this bleeding artery for several days. He regarded the blue colour of the flap as a sign of engorgement, and thinking that more blood flowed into it than could be returned from it, encouraged bleeding till it became paler.

A deficient supply of blood is a much more frequent cause of sloughing, and all our efforts should be directed towards ensuring a free arterial supply by so planning our incisions that there shall be one or more principal arterial trunks passing through the neck of the flap. Pressure by bandages or pads must be especially avoided, and the simplest dressings will hence be the most useful. Wet lint laid lightly over the raw surfaces, and styptic colloid and cotton wool over the lines of incision, will be the most suitable applications.

If, however, suppuration has come on, and union by the first intention is evidently hopeless, it is better at once to apply wet lint, and a packing of cotton wool loosely laid over the part and kept in position by means of a light and loosely applied bandage.

Dressings, Bandages, Appliances, &c.—The simplest and lightest forms of retentive apparatus are the best, in all cases of injury, and after all cutting operations, whether for plastic purposes or the removal of tumours. A simple oblong knitted

cotton band, 5 inches long by 3 inches broad, fastened across the face by means of four tapes attached to its four angles, and passed round the occiput and forehead, will, in most cases, be quite sufficient to retain in position any of the dressings required. The hollows on the sides of the nose should be filled up by pads of cotton wool, and thus all pressure upon the nose itself is avoided.

When the styptic colloid and cotton wool steeped in it have been properly applied to an incised wound, with or without stitches, no other retentive apparatus is required. The colloid, after it has become hardened by the evaporation of the ether it contains, forms a closely fitting and accurately moulded splint, and keeps the parts in close adaptation without any undue pressure.

The various forms of bandage described by Cloquet* and other French surgeons of the early part of the present century, such as the *épervier* and the *fronde du nez*, are merely complicated head bandages with, in one case, a sort of pouch for the reception of the nose. A double-headed roller, passed round the face and occiput with properly placed pads, may sometimes be used with advantage to compress the sides of the nose in cases of hæmorrhage from external wounds, but the antiquated forms of bandages above named are mere curiosities, and a detailed description of them would be entirely out of place in this work. Strips of common diachylon stickingplaster are more useful in some injuries and after some operations than any other appliance.

When suppuration has come on over a considerable surface, carbolic acid dressings in the form of watery solution or the carbolized oil will be very useful, and under these circumstances a bandage will also be required, and must be carefully applied in such a way as to avoid pressure on the prominent parts of the organ.

During the first week or ten days after the transplantation of a flap, there will probably be imperfect circulation and consequent blueness of the part, and wet or cold applications

* Op. cit., p. 426.

have a tendency to increase this. Cotton wool applied without pressure is the most appropriate application under these circumstances. It retains the natural heat of the surrounding parts, and so favours the restoration of the circulation in the flap.

SECTION XII.

Functional Derangements of Smell; Anosmia; Sneezing; Spasmodic Twitchings.

Disagreeable smells of purely subjective origin sometimes, although rarely, usher in epileptic seizures (see Dr. Hughlings Jackson's paper on the subject in the *Medical Times and Gazette*, August 13th, 1864). Dr. Hughlings Jackson considers this symptom, when associated with epilepsy, to be due to changes, probably the result of plugging, in the district of the anterior cerebral artery which supplies the olfactory lobes. In a case (quoted from the *Medical Mirror*) by M. Delasiauve, a man, aged 63 years, was the subject of epilepsy, the fit being constantly "preceded by an excessively offensive smell, which is soon followed by trembling of the limbs of the right side of the body."

In the case of a boy under the care of Dr. Hughlings Jackson, the fit was always preceded by a disagreeable smell; the boy then became insensible, and was convulsed on the right side, and when he came to himself was unable to talk intelligibly for half an hour. Dr. H. Jackson supposes that the changes in this case were in the district of the middle cerebral artery. Dr. Fletcher, of Manchester, has recorded (*Brit. Med. Journal*, April 30, 1864) a case of embolism in which (1) smell, (2) power on the right side, and (3) speech were lost, and Dr. H. Jackson has seen several cases in which the three defects were noticed simultaneously; and hence he concludes that possibly plugging of the middle cerebral artery, or great temporary contraction of its branches, may be the cause of the symptoms,

this artery supplying the centres presiding over three sets of functions disturbed in these cases, viz., smell, movement of the arm and leg, and speech.*

Besides epilepsy, nervous disorders of other kinds are sometimes associated with subjective derangements of olfaction. Dr. Kirkes remarks that it occasionally happens to every one, and especially to nervous persons, "to smell something which is not present and which other persons cannot smell;" and he refers to a case in which the arachnoid was found after death to be studded with pieces of bone, and scrofulous cysts were found in the hemispheres. (See also a case by Dr. Hughlings Jackson, Case LII in the Appendix.)

In some forms of mental disorder Dr. Forbes Winslow† observes, "the insane are often heard to complain of being exposed to the influence of most noxious and offensive smells." Dr. Lardner, in his work on "Animal Physics," writes that subjective olfactory sensations are not uncommon "with those afflicted with mental derangements," and that "insane persons often complain that fœtid or fœcal matter has been mixed with their food."

The boy whose case we recently referred to was, Dr. Hughlings Jackson tells me, sent to a lunatic asylum, having become insane soon after the case was reported.

In all these cases Dr. Hughlings Jackson is inclined to refer the temporary derangement of smell to a disturbance of the circulation either of the anterior or of the middle cerebral artery, and in some cases to plugging of one or other of these arteries.

* Dr. Hughlings Jackson's opinions have undergone some development since the remarks referred to in the text were made. He believes that in each epilepsy there is what he calls a "discharging lesion." The first thing in a paroxysm is a discharge of nerve tissue, and the currents developed not only spread to and discharge to *lower and healthy centres*, but, as he expresses it, they spread "laterally" by arteries to *associated and healthy centres;* so that he still thinks, as stated in the text, there is spreading in arterial districts, of course by the intermediation of vaso-motor nerves.

† On "Obscure Diseases of the Brain."

Complete loss of smell is sometimes associated with subjective sensations of smell, just as we sometimes have complete loss of sight associated with subjective sensations of flashes of light, in either case the sensation being no doubt due to central irritation of the cerebral tissue where the special nerves have their origin. In the Ophthalmic Hospital Reports, Dr. Hughlings Jackson has recorded two cases of nervous disease in which this curious combination was present, viz., loss of smell and subjective sensations of smell:—"In one case, the patient, a girl, aged 18 years, was deaf, and she was blind also from optic neuritis. This patient one day had a fit. Her mother said the girl's right arm and leg moved, and that she cried out, 'Oh, what a stink; what a dreadful stink in the place.' She fell, and afterwards went into a sound sleep. She could not smell scents."

Loss of smell may be occasioned by three classes of lesions. 1st, Mechanical impediments to the admission of the odorous particles to the olfactory region; 2nd, Impaired function, or destruction, of the nervous filaments of the olfactory region; 3rd, Destruction, or impaired function, of the olfactory bulbs.

Under the first head come all those causes that obstruct the nostrils. They may consist of polypi or other tumours; occlusion of the nostril from congenital malformation or cicatricial adhesions resulting from injury; collapse of the walls of the nostril, due to paralysis of the dilating muscles, such as occurs in connection with paralysis of the portio-dura of the seventh pair; obstruction of the nostrils from dry crusts or secretions, such as we meet in scrofulous or syphilitic coryza; chronic thickening of the pituitary membrane as a sequel of catarrhal or other inflammations, and the presence of foreign bodies.

In almost all these instances the loss of smell may affect only one side of the nose, and in such cases the defect is scarcely noticed by the patient, and can only be detected by experimentally testing the sensitiveness of the olfactory region, after closing the nostril supposed to be in a sound condition. It is important in making these experimental observations, and in

testing the acuteness of the sense of smell in *all* cases, to apply substances to the nostrils that are truly odoriferous, avoiding all strong, pungent substances, such as ammonia and strong corrosive acids, the action of which is simply irritant or mechanical, and affects only the nerves of common sensation. Peppermint, lavender, musk, assafœtida, and the volatile essential oils generally, are the proper materials for testing the smell in a case of supposed anosmia.

It is also important to distinguish accurately between the sense of taste and that of smell. Persons whose smell is really at fault often declare that they have no sense of taste, because they are unable to detect differences of flavour, which is, in fact, a matter purely of olfaction. Taste only distinguishes the sapid qualities of crystalloidal bodies, such as sweets, sours, salines and bitters, but has no appreciation of flavours, such as those peculiar to different meats, wines, and aromatic fruits. It sometimes happens that the posterior nares are completely obstructed in consequence of adhesion of the soft palate to the back of the pharynx, and in such cases the sense of flavours is completely lost, in consequence of the odorous particles from the food being prevented from reaching the olfactory region through the posterior nares; and nasal respiration being impossible, the perception of odours through the anterior nares is also lost. (See two cases reported by Dr. Wm. Ogle in *Medical Chirurgical Transactions*, vol. liii, pp. 272, 273. In the second of these, an opening being made through the soft palate by an operation, olfaction and the perception of flavours were both restored.)

A partial loss of smell is not uncommon, perhaps in some cases from congenital imperfection, and often in consequence of undue drynesss, or undue coating with secretion of the olfactory region in the course of catarrhal affections.

Under the second head come all those cases in which the olfactory region is invaded or destroyed by disease or mechanical lesions. In ozæna this region is often involved in ulceration, or destroyed by the extension of caries or necrosis to the upper part of the ethmoid. It is seldom, however, that the olfactory

region is destroyed in its entirety, and hence if the carious or necrosed bone is removed, or escapes spontaneously, a restoration of function is effected, and hence also it happens that in many such cases the sense may be impaired without being entirely lost, some portion of the olfactory region being untouched and unobstructed during the progress of the disorder.

Whenever the bones and soft tissues of the front of the nose are destroyed by disease, there is loss of smell, which, however, is restored, when by plastic operations, or by the employment of artificial appliances the gap is filled up. This singular result can only be explained by the supposition that, when the anterior nares are largely exposed to the entrance of air from without, the mucosa of the olfactory region becomes dried up, and so unfitted for the reception of odorous impressions; but that when the aperture is limited by artificial means, sufficient moisture is allowed to accumulate, and there is sufficient warmth in the parts to allow of a restoration of the healthy secretion and nutrition of the parts, and a consequent return to functional activity. Certain cases of loss of smell after severe catarrhal attacks with violent sneezing, occurring in elderly women, are, perhaps, due to some local mischief, implicating the fibres of the nerve in the olfactory region. These cases, however, are very obscure, and it is quite possible that in some such instances there may have been hæmorrhage into the olfactory bulbs during the violent paroxysms of sneezing, and the loss of smell may have been due to the consequent destruction of their tissues. If so, this class of cases would come under the next head of classification. It is by no means suggested, however, that the sneezing in these cases is at all traceable to any functional or lesional disturbance of the olfactory bulbs or nerves as a causative influence: on the contrary, it is almost certain that sneezing is induced by irritation of branches of the fifth pair of nerves; but the violent concussion in the act of sneezing may be sufficient in some cases to tear through the connection between the olfactory bulbs and the olfactory nerve-fibres, in the same way that blows on the occiput have been supposed to

cause a similar lesion, from the fact that loss of smell has followed the injury. Judging, however, from the analogy of the occasional occurrence of retinal apoplexy under similar circumstances, it is perhaps more within the range of probability that hæmorrhage may have taken place into the substance of the bulbs or beneath them.

But it is only in cases of *sudden* loss of smell *in the course of* severe catarrhal attacks that the above suppositions will serve to explain the phenomena, and then only, when the anosmia is associated with other cerebral lesions, such as amaurosis or aphasia. For the cases in which, *after* a catarrhal attack, there is a more or less gradual loss of smell, associated with obstruction to inspiration through the nostrils, Dr. Wm. Ogle has furnished a sufficient explanation in his essay in the 53rd volume of the *Medical and Chirurgical Transactions*, pp. 370 et seq. He there relates the case of a lady who partially lost the power of inspiring through the nostrils after a violent cold or influenza. She could expire through the nose with tolerable ease, but, when she attempted to inspire, she felt as though there were some obstruction, which prevented her doing so with the same ease and fulness as can others, and her voice was slightly nasal in tone. The most strongly smelling substances were placed under her nostrils, while she inspired through the nose, without her perceiving in the least degree their smell. Her perception of flavours remained almost in its integrity. "We have only to suppose," such is Dr. Ogle's explanation, "what is highly probable, that the Schneiderian membrane has been so thickened by chronic inflammation as to bring the septum in contact with the middle turbinated bone and its prolongation, the *agger nasi*, a result which, we have already seen, would require only an excessively slight thickening of the membrane; and, secondly, that this thickening has not only thus cut off the olfactory from the respiratory channel, but that it has also obstructed the former and narrower of these two, the obstruction being of such a kind as entirely to prevent the passage of air inwards, while it allows of the passage of air outwards. We must suppose,

that is, that the projecting fold of membrane acts as a valve. That this was the case is rendered almost certain by the fact that the respiration by the nose was much freer than was the inspiration." This satisfactorily explains the absence of olfactory sense when the odorous substance was held under the nostrils, and also the persistence of the perception of flavours, there being no obstruction to the free passage of air from the mouth through the posterior nares.

Disease causing the disappearance of pigment from those parts of the body in which it is normally present, and therefore specially affecting the olfactory region, produces anosmia as one of its results. A remarkable case quoted by Dr. W. Ogle so well illustrates this, that I shall take the liberty of transcribing it from his essay: "A boy in Kentucky, son of two black slaves, had, up to his twelfth year, a skin of the same dark colour as that of his parents. At this period a white patch appeared near the inner canthus of the left eye. This white patch spread gradually, until in ten years' time it extended over the whole external surface of the body; so that, but for his woolly hair, the boy might have been taken for a very fair European. Later on, some few brownish or copper-coloured spots appeared on the face and hands; but the parts which were not exposed retained permanently their perfect whiteness. At the same time that the boy began to change his colour, he began also to lose the sense of smell, and by the time he had become white, his smell was so seriously impaired that Dr. Hutchinson, who records the case, states it to have been completely lost." (*American Journal of Medical Science*, 1852.) This case is important, as presenting us with a pathological condition typical perhaps of a class of similar cases, the manifestations of which are less conspicuous. Mere deficiency of pigment may possibly cause defective perception of odours, and if so, we should expect all albinos, both men and animals, to be deficient in smell or anosmic, and many facts in natural history go to prove that defective perception of odours is one of the many disadvantages under which albino animals labour. If it were established that pigment is altogether

absent from the olfactory region of the albino, it would be only logical to expect total loss of smell, or very great impairment of this faculty; but Dr. W. Ogle has pointed out that in most albino animals the pigment remains in the integuments of the nose and ears, and we may therefore assume that it is not altogether absent from the olfactory mucosa; nevertheless it is probable that the olfactory region in albinos partakes to some extent of the general constitutional deficiency, and that they do suffer from an obtuseness in the perception of odours. To this cause (involving as it does an inability to avoid poisonous and unwholesome food) their tendency to die off rapidly in a wild state, or when allowed, though domesticated, to choose their own food, is probably due, as much as to their general delicacy of constitution, and their consequently greater susceptibility to the ravages of disease and climatic influences, and to the attacks of the larger and stronger carnivora. In respect to the last-named source of danger, the whiteness of their coats renders them more conspicuous to their foes, and therefore adds one more to their other numerous disadvantages in the struggle for existence.

In comparing the case of the negro boy, who became anosmic simultaneously with the loss of the pigment of the skin, with the case of albinos, it is obvious that we are comparing a pathological process with a physiological defect. For the albino animal can hardly be looked upon as suffering from a pathological condition, whole races and breeds being continually reproduced, though they do not ultimately survive in a wild state. Hence, though the two cases are of interest as illustrating the physiology of olfaction, when placed side by side, they do not stand in the relation of varieties of the same pathological process.

A case has been recorded in which the continual inspiration of the fumes of ether, accidentally, in the course of some experiments on animals, caused a gradual failure of the sense of smell, and at last its total aberration, the effect being attributed to the continuous contact of the sulphuric ether with the minute branches of the olfactory nerve. (Virchow's Archiv. iv, 41, 1867.)

Under the third head come all cases of intracranial disease affecting the olfactory bulbs, either by destroying them, or by pressing upon them so much as to impair their nutrition and functional activity. Tumours of any kind may involve or compress the bulbs, and when this is the case there are generally associated with the anosmia other symptoms of cerebral disturbance, and of these, amaurosis is one of the most common. But optic neuritis, without any marked impairment of vision, may be associated with anosmia (see a case by Dr. H. Jackson in the *British Medical Journal*, Aug., 1872), and in such instances there is probably olfactory neuritis, or pressure upon the bulbs from an intracranial cause. The ophthalmoscope will be of great use in forming our diagnosis in such instances, and the fact that the ophthalmoscopic appearances of optic neuritis may be present without any serious defect of vision, renders it more desirable to examine the eyes ophthalmoscopically in all cases of anosmia the origin of which is obscure.

Dr. Hughlings Jackson has called attention to effusion into the lateral ventricles as a possible cause of anosmia from intracranial disease. In a case related by him in the *Medical Times and Gazette* for Oct. 17, 1874, there were symptoms of a tumour of the middle lobe of the cerebellum and great enlargement of the head (due apparently to effusion into the lateral ventricles), and in this case there was loss of smell.

Dr. Hughlings Jackson supposes that in this instance, and in another which occurred to Sir William Gull, the loss of smell was due to pressure upon the olfactory lobes and not to any actual disease or tumour in their immediate neighbourhood (see Case LIII in the Appendix):—In a case at present (April, 1875) under my care at the Royal South London Ophthalmic Hospital, there is loss of smell and taste, associated with optic neuritis in one eye and a prominence of the region of the frontal sinus. Here the mischief is probably intracranial in part, and the disease may have originally started from the orbit or frontal sinus, and invaded the region of the olfactory bulbs at a later period.

Injuries of the head and, more particularly, severe blows on the occiput, have occasionally been followed by anosmia. Dr. William Ogle, in the essay above referred to, adduces five instances, and in four of them the occiput was the part struck. He suggests that, as Mr. Hilton has pointed out, the olfactory bulbs and the other portions of the brain resting on the anterior cranial fossa are more likely to be injured by blows on the occiput than those parts between which and the skull there is a layer of cerebro-spinal fluid.

In a case of injury to the back of the head from a bicycle accident, recently under my observation, the loss of smell which followed was associated with deafness of one ear. The skull in this case was struck just behind the ear, and the patient was completely insensible for an hour or two after the blow.

The anatomical relations of the olfactory bulbs and of their external roots to the fissure of Silvius and the third frontal convolution of the brain, would lead us, *à priori*, to expect that lesions of the brain causing aphasia would also occasionally be associated with anosmia as a complication; and this is actually the case, as Dr. Hughlings Jackson and Dr. Wm. Ogle have pointed out. In the instances already given of subjective disturbances of smell associated with aphasia, there was also loss of smell, and in Dr. William Ogle's essay already referred to, two cases are given illustrating this connection of the two sets of symptoms involved in these two functional defects. In these cases the loss of smell is confined to one nostril, and this on the same side as the brain lesion, and the loss may be partial or complete on that side. Where the brain lesion affects both sides, as it may do, with aphasic symptoms, of course there may be bi-lateral anosmia.

From the researches of M. Serres ("Anatom. Comp. du Cerveau," i, 295) it appears that lesion of the external root of the olfactory bulb is more efficacious in determining anosmia than is lesion of the internal root.

Treatment.—Whenever the loss of smell can be fairly attri-

buted to temporary loss of functional activity; excitation of the Schneiderian membrane by the passage along it of the constant galvanic current, with interruptions, will sometimes arouse this dormant sense. In the hands of Dr. Cohen, of the Jefferson Medical College, Philadelphia, electricity has sometimes proved adequate for this purpose. (Cohen, "Diseases of the Throat," p. 290.) In the class of cases of anosmia, due to mechanical obstructions, the obvious indication is to remove the impediment to the access of the odorous particles, while in those cases in which the cause is central little or nothing can be done by way of treatment.

Sneezing.—This convulsive action of the body generally, and of the respiratory muscles in particular, is only indirectly connected with affections of the nose. It is in most cases excited by irritation of the pituitary membrane, the stimulus being conveyed through the fifth nerve to the medulla oblongata, and thence reflected to the muscles concerned in respiration and certain groups of muscles of the trunk and limbs. It is therefore generally a reflex action, and, when the preliminary excitation of the nervous centres has reached a certain point, is beyond the control of the will. There is, however, good reason for believing that in certain rare cases the irritation giving rise to the convulsive movements of sneezing is central.*

Irritation of branches of the fifth nerve, besides those distributed to the nostrils, will sometimes excite the same movements. The sudden stimulus of a strong light when the person exposed to it has been in comparative darkness, sometimes excites a fit of sneezing, and this occurs most frequently when there is a morbid sensitiveness of those parts supplied by the fifth pair, as for instance in catarrhal affections of the conjunctiva in scrofulous children, especially in cases of scrofulous keratitis; the

* How else are we to account for the cases of sneezing induced by emotional causes (as, for instance, those alluded to in "Obs. Rares de Medicine, &c.," Stalpat van der Wiel, of individuals in whom the act of coitus was often preceded by sneezing), or those of a succession of sneezing fits several times in the hour going on for years. These instances point to some analogy between this affection and asthma.

photophobia in these cases being due to morbid hyperæsthesia of the ciliary branches of the fifth pair centrally reflected to the retina.

The following is the succession of the phenomena in the ordinary act of sneezing, the description being an almost verbatim translation of M. Hippolyte Cloquet's article in his work on Osphrénologie.

A tickling sensation in the nose, and an analogous sensation in the præcordial region, are succeeded by a long inspiration during which the lips and jaws are separated, the nostrils widely dilated, the eyes generally half-closed, and the head thrown back. This inspiration is followed by a sudden and violent expiration, which, in consequence of a movement of the base of the tongue and the velum palati, forces the air with a noisy rush from the nasal fossæ, scours them out, as it were, and dislodges from them all the particles lying in contact with their lining membrane. During this expiration no part of the body is quiet, and hence perhaps some authors have regarded sneezing as a sort of temporary epilepsy ("Avicenna," lib. iii, c. 2, tract 2); the head and all the members move with more or less vivacity in such a way as to favour the action of the muscles, whose function it is to constrict the chest; the neck and the thighs are flexed. These phenomena are performed with different degrees of force and of intensity, according to the physicial constitution of the indviduals affected. Immediately after the cessation of these movements the frame sinks into a general but agreeable lassitude; a copious effusion of serum moistens the cavities of the nose; the eyes are wet with tears.

The most common exciting cause of sneezing is a mechanical irritation of the nasal fossæ. The stimulus must be of a delicate kind, coarse or rough irritation being productive of pain. Pustules in the mucous membrane seem to cause sneezing, or a tendency to it in some cases, and violent and persistent fits of sneezing are noted as having been present in cases in which foreign bodies were lodged in the frontal sinuses. The air entering the lungs of new-born infants is supposed to be a cause

of sneezing in them, but the simultaneous exposure of the pituitary membrane to a current of air, and the exposure of the face and upper part of the thorax to the light and air may have an equal share in exciting this act.

It comes on often in the commencement of coryza, and is then vulgarly attributed to a chill of the surface, or the suppression of perspiration. It is quite as rational to attribute it to the hyperæsthesia of the mucous membrane of the nose and the greater susceptibility to external impressions, such as a current of cold air, or the entrance of minute foreign bodies. According to Wedelius ("De Medicam. Facultat." p. 211), sneezing often ushers in the access of epilepsy or marks the termination of the fit.

In most cases it is uncontrollable by the will. The muscles once thrown into action, contract in a truly convulsive manner. Few persons can check themselves when they want to sneeze; nevertheless if the attention be suddenly directed to some other object at the very commencement of the preliminary tickling in the nose, the convulsion does not occur. It is also possible, as I have proved by experiments on my own person, to stop the sneeze when the tickling in the nose has only just commenced, by firmly pressing together the alæ nasi against the septum, and stopping the breathing by a strong effort of the will. But this does not always succeed, and it is perhaps rather a dangerous experiment when it does not, because the act of holding the breath causes great congestion of the head, and there may be some danger of rupture of the cerebral blood-vessels during the sudden convulsion of a sneezing fit, after a prolonged effort of repression.

The effects of sneezing are generally beneficial in various ways. Hoffmann has seen, under its influence, small stones shot from the meatus auditorius, and calculi have been supposed to escape from the kidneys and ureters. But ill effects are occasionally observed, *e.g.*, pulmonary hæmorrhage, menorrhagia, sudden death from rupture of aneurisms; amaurosis from retinal hæmorrhage, epilepsy, apoplexy (Alibert), and perhaps anosmia (see Case LV in the Appendix).

"A man died of cerebral apoplexy, after having sneezed twenty-four times in succession, and at the commencement of the twenty-fifth." *

Sneezing has caused abortion. It may amount to an actual disease in itself. It has been known to occur several times in the hour, during whole years, without the general health becoming affected ("Ephem. Curios. Nat.," December 2, ann. 6, 1687, Obs. 93). Godefroy Schubart has preserved us the history of a young girl of 17 years, who during several nights suffered from an attack of sneezing, the fits of which were repeated three hundred times and more at each outset (*ibid.*, Dec. 1, ann. 3, 1672, Obs. 138). J. P. Albrecht relates that of an infant in whom it occurred one hundred times an hour, and caused death (*ibid.*, December 2, ann. 6, 1687, Obs. 12). Frequency of sneezing has been known to cause blindness, a change of direction of the globe of the eye, and a violent epistaxis.

It sometimes occurs as constantly repeated paroxysms in hysterical young women, and is then best treated by the administration of valerianate of iron and the use of a weak solution of aq. Laurocerasi, snuffed up the nostrils (see letter from Dr. Mayer, of Antwerp, *Lancet*, January 9, 1875).

If there is excessive hyperæsthesia of the pituitary membrane, the use of tobacco snuff is very efficacious, and an instance in which this plan of treatment succeeded in lessening the number and diminishing the violence of the paroxysms was lately recorded by Mr. Gray, of Edinburgh (*Lancet*, January 16, 1875). In this case the patient was a lady of slightly hysterical temperament.

In fevers, and especially typhus, sneezing has been considered a prognostic sign of death for the patients in whom it was observed (Thucydid., "De Bello Pelopon."). It is on this account that the custom of saluting people and invoking the assistance of heaven against this kind of danger is supposed to

* Fannan Strada. Prolusiones Academicæ et Bonnet, lib. i, sect. 20. But the judicious Morgani ("De Sedibus et Causis Morborum," epist. xiv, No. 16) throws some doubt on the sneezing being the immediate cause of death.

have arisen. This custom, however it may have originated, has existed among all nations. The Spaniards found it established in Florida when they made the conquest of that island. Others recognise in sneezing something sacred, and this is the opinion of most of the ancients, who regarded the head as the most noble part of the body. Xenophon, in the story of his expedition, relates that when anyone sneezed in the presence of the King of Persia, every one prostrated himself as if to adore a god. Tiberius required that under similar circumstances those present should pay him homage, and Aristotle inquires why sneezing has been made a divinity rather than cough and belching. At the commencement of convalescence sneezing is considered a sign of good omen, and formerly in the hospitals of Paris a patient who sneezed was considered to have gained sufficient strength to return home. *Sternuit, salva res est, et nosocomio expelli debet*, said the physicians proverbially.

Spasmodic twitching of the nose is sometimes seen as a form of chorea, and is then generally associated with similar convulsive movements of muscles in other parts of the face or body. It is a very formidable malady to those afflicted with it, and, if it has been of long standing, very difficult to cure. If seen early, the treatment by those methods best adapted for chorea in other parts will be most suitable in this part. In some cases the movement is, in the first instance, a mere trick, and becomes from the constant repetition a confirmed habit. The same sort of origin accounts for the habit of snuffling, to which some persons are addicted, probably in the first instance excited by a cold in the head.

SECTION XIII.

Intracranial Complications of Affections of the Nose, and its Accessory Cavities.

It has been known from an early period that the inflammatory affections of the bones of the roof of the nostrils are occasionally associated with severe cerebral symptoms; and when we consider the very thin bony partition constituting at once the floor of the cranial and the ceiling of the nasal chamber, it is not surprising that inflammatory mischief in the one cavity should sometimes extend to the other. Rather is it to be wondered at that such accidents are not of more frequent occurrence. The possibility of their so extending is, however, now commonly recognised, and it becomes important to ascertain under what circumstances they may be expected and avoided.

Probably the most frequent cause of meningeal inflammation extending from the nose is caries of the ethmoid. Cases of the kind have been already alluded to in Section IV, p. 119. Many others not there alluded to have been recorded by various authors. For example, Dr. Abercrombie ("Pathological and Practical Researches on Diseases of the Brain," Edinburgh, 1845, p. 39) alludes as follows to the occasional occurrence of intracranial disease associated with disease in the nose. "A person who has been liable to pain in the forehead and purulent discharge from the nose, becomes at last forgetful and delirious and dies comatose. The ethmoid bone is found carious, the dura mater corresponding to it is diseased, and there is a deposition of pus betwixt it and the brain, sometimes an abscess in the brain

itself. Several cases of this kind are mentioned by Lieutand and Bonetus. Morgagni mentions a priest who, after being affected with fever, delirium, pain in the forehead, and convulsions, fell into coma, from which he was relieved by discharging purulent matter from the nose."

Sir William Gull and Dr. H. G. Sutton have called attention to the occasional occurrence of abscess in the brain in the course of chronic disease within the nostrils. ("Reynolds' System of Medicine," vol ii, p. 579, article on "Abscess of the Brain.") In one of the tabulated cases there recorded by Sir William Gull (from "Guy's Hospital Reports," vol. viii, 3rd series), the patient was a man, aged 43 years, with chronic disease of the mucous membrane of the nose, who was suddenly seized with lightness in the head, followed by convulsion, insensibility, then recovery; and again, convulsion a second time on the same day. On the third day headache, increasing to great intensity on the fifth, referred to the right side of the forehead, &c. No delirium. Death on the eighth day in coma. After death, acute abscess in the middle lobe of the cerebrum on the right side. In a similar case also recorded by Sir William Gull, there was softening and ulceration of the convolutions of the anterior lobe of the right hemisphere, the brain symptoms having commenced five weeks before death by vertigo and headache, and culminating in insensibility and paralysis twelve days before the fatal issue.

Injuries leading to necrosis may also be followed by meningitis, and the same thing is very likely to occur after penetrating wounds or fractures of the bones. Foreign bodies lodged in the nasal cavities or the frontal sinuses, may lead to the same complication.

Polypi and other tumours are also sometimes the exciting causes of intracranial disease, as in the instance of Mr. Simon's (*Medical Times and Gazette*, June 19, 1858; see Case LXXXIIIA in the Appendix), in which a nasal polypus had by pressure obliterated the trunk of the internal carotid artery and caused absorption of the body of the sphenoid. After death, three abscesses were found in the brain.

Almost all the fibroid polypi that are allowed to grow without surgical interference to their full extent, ultimately involve the base of the brain, and in their late stages are associated with coma, convulsions, and other cerebral symptoms. Malignant growths also give rise to similar results, and are accompanied with severe frontal headache from an early period.

Abscesses of the frontal sinus may, as we have seen (Section V, Subsection 3; see Case XVI in the Appendix), burst into the cranial cavity, and abscess of the antrum may terminate by necrosis of the floor of the orbit, and secondarily involve the base of the brain. Fatal meningitis from this cause occurred in Cases XXXIV and XXXVII in the Appendix.

Epistaxis has indirectly been a cause of suppurative meningitis. Dr. Habershon recently related at the Medical Society of London, the case of a patient affected with leucocythæmia, in whom epistaxis was so uncontrollable that plugging of the posterior nares was resorted to. The plug was not retained beyond a reasonable time (not longer than twenty-four hours, but the patient rapidly became comatose, and after death purulent deposits were found in the neighbourhood of the Eustachian tubes, and the sinuses of the dura mater. From these appearances there could be no reasonable doubt that the plugs in the posterior nares had been the means of retaining putrid discharges in contact with open blood-vessels, and that, in consequence of the peculiar constitutional predisposition of the patient, pyæmia had resulted.

Surgical operations in this region are liable to be followed by cerebral complications for the same reasons. It has been noticed that in a case of operation for the removal of a sequestrum from the nostrils by Dr. Rouge's operation (Section IV), the patient died of pyæmic infection with meningitis. The removal of tumours of various kinds, and especially of hard fibrous or bony tumours from the frontal sinuses or the upper part of the nares is also attended with considerable risk. When they have attained a large size, and have invaded the orbit as well as the nasal cavity, the danger of interfering with them is greatly increased,

the more so as there are no certain diagnostic indications of their depth or extent backwards. So that a tumour which has been unaccompanied by any symptoms commonly recognisable as cerebral, and which to external appearance is attached to the external aspect of the bones of the base of the skull, may be found after death to extend through the sphenoidal fissure, or through an absorbed portion of the body of the sphenoid into the base of the skull. Accidental injuries of the bones of the nose, if accompanied with much violence, may lead to cerebral complications. The vomer and cribriform plate of the ethmoid may be fractured, and the fossa of the cranial cavity thus exposed to dangerous communication with the roof of the nasal fossæ; or the vomer may be driven upwards, and with it the cribriform plate of the ethmoid and crista galli carried into the cerebral tissue. This latter accident occurred in a case recently in the Great Northern Hospital, the nasal bones being at the same time fractured and displaced backwards. The usual symptoms of fractured base of the skull are present in these cases, a persistent flow of blood or serum from the nares being generally a striking feature in the case. Injuries of the frontal sinus are liable to be followed by inflammatory mischief within the skull, indicated by delirium or coma (see Case XV in the Appendix). Abscess in these sinuses or in the antrum, if they are associated with orbitar inflammation, are not unlikely to lead to meningitis or cerebral abscess (see Cases XXXIV and XXXVII in Appendix). Intracranial tumours presenting in the nostrils are another source of danger in proposed operations. Meningoceles and encephaloceles have been shown to simulate nasal polypus, and the attempt to remove such tumours could not but be followed by disastrous results (see Section LXXIII in the Appendix). A fibrous tumour involving the 2nd division of the 5th pair was in one case mistaken for a nasal polypus and attempts to remove it terminated fatally. Plastic operations on the nose are not free from similar danger. The transplantation of the periosteum is especially liable to be followed by purulent infection, if suppuration of the denuded bone should come on. In other instances

sloughing of the flap may lead to similar dangers, and, whenever the patient's constitution is in an unfavourable condition, or the hygienic surroundings are faulty, purulent infection is one of the possible dangers that will have to be taken into account.

In two of Dieffenbach's operations for the restoration of the nose death resulted from this cause.

In Section XII it has been shown that *anosmia* is often associated with other symptoms indicating intracranial disease; among these optic neuritis, with or without amaurosis, aphasia, convulsions, and paralysis are the most common. Deafness is also occasionally present. In a case at present under observation optic neuritis was associated with loss of smell and taste, and with old-standing purulent discharge from the nostrils, and recent enlargement of the frontal sinuses. Injuries of the occiput may give rise to anosmia from laceration or displacement of the olfactory lobes, and in these cases the primary symptoms may be those of concussion with subsequent and permanent mischief, such as deafness, paralysis, aphasia, coma or convulsions.

SECTION XIV.

The Function of Smell in its relation to Hygiene, Sanitary Science and Medico-Legal Questions.

Subsection 1.—*The Function of Smell in its relation to Hygiene and Sanitary Science.*

"Non cuicunque datum est habere nasum" is a favourite sentiment with many who, perhaps, plume themselves on the possession of unusually good olfactory apparatuses. Doubtless the sense of smell is in many people more or less blunted by constant exposure to the foul atmosphere around them, or they would never be able to endure the abominable smells that so afflict the noses of their friends and neighbours. It is indeed remarkable that even a temporary exposure to the influence of certain odours (and possibly to all) begets a temporary insensibility or indifference to them. Children and their instructors, shut up in a close schoolroom, are often quite unconscious of the foulness of the air they are breathing, but a visitor fresh from the outer air is at once struck with its unpleasantness and closeness.

This singular temporary insensibility to the presence of organic odorous matter in the air was noticed by Dr. Angus Smith in the course of his "Experiments on Air and its Impurities." He found that, after being shut up in an air-tight chamber for a time, he experienced various unpleasant sensations, but did not notice the disagreeable odour, though it was at once perceptible to persons who entered the chamber as soon

as he quitted it. Enter a bedchamber that has been shut up closely all night, though the occupants of the room are quite unconscious of it, you will at once perceive an unpleasant odour. I have observed the same thing on entering the out-patient rooms of hospitals, those in the room before me being often quite unconscious of the foul state of the atmosphere, and it has sometimes surprised me that, on going out into the open air and shortly returning, the odour of the room, previously unnoticed, has been singularly oppressive. Hence it would appear that the acuteness of smell becomes temporarily blunted by exposure to the influence of some kinds of odorous impressions. The sense is, as it were, demoralised and depraved by the surrounding atmosphere; the sentinel has been drugged and stupefied, and his vigilance no longer warns us of the approach of noxious or poisonous assailants of our respiratory citadel.

The danger of this temporary loss of functional activity in so important a sense-organ should be as widely known as possible. It is obvious that in all schools, churches, hospitals, theatres, and all other rooms in which crowds of people congregate, thorough ventilation is the only safeguard against the dangers indicated. In the case of schools particularly, it is the duty of those who manage them to take care that the children are not kept sitting too long in one room, but that they should occasionally, if only for 5 or 10 minutes at a time, be allowed to go out into the open air to play, while the windows of the schoolroom are opened and the air renewed by allowing a thorough draught to pass through it. In the winter the fires will generally ensure a constant change of air in the rooms; but in the still air of summer or autumn when all the vegetative processes and putrefactive changes are going on with the greatest rapidity, and when zymotic diseases have the best chance of spreading, it is hardly possible to give sufficient ventilation, and the fear of thorough draughts may be judiciously ignored by those who have the management of schools and similar institutions.

As regards personal hygiene, it is well to remark that some

people seem to be quite unconscious of the unpleasant odour that proceeds from them. This is singularly the case with regard to the feet in some persons. However much they wash there is a constant perspiration from the feet with a most penetrating and offensive odour. The constant or frequent use of carbolic acid soap will sometimes remove this, and the liniment of belladonna is also said by Dr. Ringer to be very efficacious in these troublesome conditions. In very fat elderly people the secretions of the armpits and groins are often very disagreeable, and yet they themselves do not seem to be aware of it. In very aged people want of cleanliness is perhaps the cause or principal cause of this disagreeable and offensive state of things, and it then becomes the duty of the friends to hint to them that a warm bath occasionally would be very desirable. In imbecile people this will of course have to be insisted upon, as otherwise excoriations are very apt to form in the parts affected, and are often very difficult to cure.

In boys and young men the secretion under the prepuce is sometimes allowed to collect, especially if the foreskin is long and with a narrow orifice; and this is often very offensive, and may even give rise to excoriations and balanitis. Hence it is always well to advise frequent ablution of this part—morning and evening if the prepuce is long, but in all cases every morning.

Children at the breast have a peculiar odour, recognisable by their nurses, by which the latter profess to be able to say whether they are in good health or not.

Whether all offensive odours are necessarily noxious or poisonous is a somewhat doubtful matter to determine. At the outset of the inquiry we are met by the difficulty of defining what constitutes an offensive odour. Odours that are offensive to some are inoffensive or even agreeable to others, and *vice versâ*. The scent of musk, for instance, is extremely unpleasant to many people, while many others think it an agreeable perfume. Even the smell of apples is intolerable to some. Assafœtida was employed by the ancients as a seasoning, and is

even now eaten in large quantities by the Persians, Hindoos, and other Asiatics. The odour of the oil of the whale is delicious to the Greenlander, and we need not take examples from the lower animals only to prove that the scent of putrid flesh is agreeable. Besides the carnivora and the various birds of prey, some of the lower races of man have a preference for putrid game and fish. Even in civilised life not a few people enjoy the scent and taste of high or putrescent venison, partridges, or hares.

It is remarkable, too, that persons who suffer from the most loathsome disorders, such as open cancers, smallpox, and ozæna, are not themselves affected with the same disgust, so far as their olfactory organs are concerned, by which others who approach them are often powerfully repelled.

Foul smelling breath, whether from decayed teeth or morbid secretions, is seldom a source of annoyance to the person who is the subject of it. And it may be taken as a rule that the emanations and effluvia of any individual, whether the onion-scented breath, or the foul perspiration, or offensive sore, are not repulsive to that individual, though they may excite the greatest disgust in others.

Nevertheless it is a clear instinct of the human race to avoid that by which his nostrils are offended, and we may conclude that each individual has a tolerably safe guide in his *own* nose. Most persons can judge for themselves as to the desirability of remaining long in an atmosphere charged with sewer emanations; but it is nevertheless well to warn all that the most offensive are not necessarily the most poisonous, nor the least offensive the least so. Indeed, many of the most virulent zymotic poisons, such as that of cholera, are supposed to have no odour whatever. The same may be said of malaria, and it is possible that one of the most terrible features of these poisonous emanations is that they give no warning of their approach or presence by their influence on our senses, and that the insidiousness with which epidemics thus spread is due to this circumstance more than to any other. It is also well to point

out to those who think they are quite safe in "following their nose" in these matters, that the constant presence in a house of sewer emanations renders the inmates of the house insensible to the offensive odour generally associated with them, and it is hence sometimes the doctor or some visitor who first gives offence to the master or mistress of a house by mentioning the fact of there being an unwholesome smell of drains. Such has been my experience on more than one occasion, and I have no doubt every medical man has been equally unfortunate in meeting with this reward in the performance of a clear duty to his patient.

*Anosmic** individuals should be aware that they run great risks in regard to sewer emanations and other poisonous effluvia, and unless their own deficiency is supplied by the occasional loan of a neighbour's nose they may suffer more serious troubles than the loss of a sense only would lead them to anticipate.† But perhaps those whose olfactory powers, though not lost, are faulty or imperfect, run as great a risk as the anosmics. For being unconscious perhaps of their deficiency, they may take no precautions against it, and hence may be breathing foul air for a long time without noticing anything to arouse their suspicions or alarm them as to its possibly poisonous nature.

Influence of colour on the absorption of odours.—Haller, of Vienna (see Dr. Murchison's Work on "Fevers," p. 88), observes

* It is remarkable that there is no word in the English language to express the loss of smell, nor the loss of taste, and unless we use the word above given, we should be driven to the inconvenient form of expression "an individual who has lost the sense of smell."

† The observations of Dr. William Ogle in reference to the anosmia (observable or inferred) in albino rabbits, and in animals generally, in whom the pigment is deficient, have a distinct bearing upon this point. He shows that such animals die much more rapidly than those with normal pigmentation of the skin and sense-organs; and it is supposed that they are unable, by smelling the different substances that form their food, to protect themselves against unwholesome or poisonous plants, and that in consequence of this deficiency they very soon suffer in health and ultimately perish. It is not impossible that their health also suffers from an inability to distinguish by scent the wholesome from the unwholesome places for their dwelling or sleeping holes.

that *dark coloured materials of clothing* are more prone to absorb the contagion of typhus, and to convey it to other individuals than those which are light-coloured. He found that among troops wearing dark-coloured uniforms it more frequently happened that new cases of typhus entered the hospital after a convalescent patient had joined his corps than among those wearing light or white uniforms. It may be mentioned that in dissecting-rooms dark clothes acquired the cadaveric odour sooner, and were deprived of it less readily than light ones; and he ascertained by experiments that the absorption of odours is regulated by the laws which govern the absorption of light.

Experiments have also been made by Dr. Stark, of Edinburgh, in order to determine the differences in this respect of differently-coloured substances. He found that black was the most powerful absorbent of odours; next in order came blue; then, successively, with decreasing intensity, green, red, yellow, and last of all white, in this absorption was reduced to a minimum. Like experiments were afterwards made by A. Dumeril, of Paris, and with practically like results. (Dumeril, "Des Odeurs et de leur nature Physiologique." Paris, 1875.) The above is quoted from Dr. W. Ogle's Paper * in vol. liii of the *Medico-Chirurgical Society's Transactions*, on "Anosmia."

It is related of the well-known blind philosopher, Dr. Moyse, that he could distinguish a black dress on his friends by its smell. (Abercrombie, on the "Intellectual Powers," p. 52.)

From a consideration of these various facts, it is perhaps worth while to inquire what may be the effect of colour in the dress of nurses, medical men, and others who attend on the sick, or

* In that valuable essay, Dr. Ogle throws it out as a suggestion that the dark pigment of the olfactory mucosa performs the important function of absorbing the vibrations of odour, in the same way that the choroidal pigment absorbs those of light. Possibly, the more subtle changes taking place in this region of the nostrils (whether of the nature of chemical, vital or chemico-vital processes) may require the modification of colour to render them sufficiently delicate for the olfactory nerves to take cognizance of. The influence of a yellow light in retarding or preventing changes of a chemical nature (as in photography) is well known. May not the sienna brown tint of the olfactory region serve some similar purpose?

whose occupations expose them to be contaminated by odours of a disagreeable or dangerous kind. It is probable that those nurses whose dresses are composed of black woollen materials are a source of danger to their patients in the wards of hospitals, and that light washing materials would be much more suitable as well as more agreeable to themselves and those on whom they attend.

Surgeons and medical practitioners generally ought to be particularly cautious with regard to personal cleanliness. Hysterical women and persons of a highly susceptible nervous system are sometimes seriously disturbed by the scent of anything conveyed by the dress of their medical attendants. They may be even thrown into violent convulsions by certain odours which from their peculiar idiosyncrasy are peculiarly disagreeable to them. Hippocrates warns us on this point, and Dietrich also enunciates his opinion in a sentence which has become almost proverbial as a precept:—"Vitare omnino medicus vestimenta odorifera; optime olet medicus quum nihil olet?" —Anglicè, "They smell best, who smell least." After any surgical manipulations the hands should be washed in a weak solution of permanganate of potash, and if possible the dress should be changed before visiting another patient. All foul dressings, sponges, and appliances, should be most carefully deodorised after use, and all the minutiæ of disinfection should be carefully attended to. The use of sponges is rapidly passing into disuse, and cotton wool is now becoming commonly substituted as a means of cleansing wounds in the practice of many surgeons. The soiled cotton wool can be destroyed immediately after use, and all risk of carrying infectious discharges from one patient to another can thus be avoided.

The use of ether as an anæsthetic, now becoming so common, is attended with the great disadvantage, that the room, furniture, and the clothes of all present at the operation become impregnated with the odour for a considerable time afterwards. I have myself frequently been unable to get rid of this unpleasant odour from my dress even after passing through

the air for several miles after an operation, and on several occasions the next patient on whom I have called has detected the offensive odour left by this valuable anæsthetic. The apparatus for administering ether devised by Mr. Hawksley, the instrument maker, partly obviates this inconvenience, but some means of entirely removing it is still a desideratum.

Alcohol and oily fluids seem to have a special affinity for odorous particles, and the knowledge of this principle guides the perfumer in the preparation of his essences, pomades, &c. It is therefore important that alcoholic and fatty or oleaginous articles of food should always be kept in closed vessels, especially in the sick room. Milk, in virtue of its composition, being very largely oleaginous, has a strong affinity for odorous particles. I am informed by a medical friend, who resides in the country, that a small quantity of carbolic acid used to wash down the floor of his dairy, where the pans containing the milk were exposed, tainted the whole of the milk with its unpleasant smell and taste. Butter is very often spoilt by being shut up in a cupboard with strongly scented articles of food; and I am informed by an army surgeon, who has served in India, that a bottle of wine will become tainted with the smell of musk if a musk-rat has even run over the corked bottle. If this be so, there must be a very strong affinity between alcoholic liquids and the odorous particles of musk, for I believe that it is the only recorded instance of the possibility of odorous emanations penetrating glass. However that may be, we have sufficient evidence that the oleaginous and alcoholic series of foods are very liable to become impregnated with odours of various kinds, and this should make us particularly cautious in protecting them from all possibility of sewer-gas contamination. Yet we often find pantries, in which these kinds of food are constantly kept, built on the basement of a house in close proximity to a water-closet or untrapped drain, and hence the butter and milk are often spoilt, and even become poisonous to the persons who partake of them.

With regard to the effects of the scents of flowers on the

health, it is probable that it is not very wholesome to have the air of rooms, especially sick rooms, much scented in this way. We are, however, still much in the dark as to the influence of these odours apart from their associate emanations of a more ponderable kind.* There is no question that certain persons are powerfully affected by certain odours, and in an entirely different manner by others. But other individuals are either indifferent to both varieties or are affected in a different way by them. The imagination and associations connected with particular scents have often a large share in the effects produced upon sensitive people. A child who has once been tricked into taking a nauseous dose by the disguise of a pleasant odour, is very likely to be disgusted with that scent ever after. Many curious instances are given of special idiosyncratic antipathies as regards odours, so that general malaise, fainting, or epistaxis have been induced by odours that to most persons are either agreeable or indifferent. (See Cloquet's "Osphrésiologie," p. 133 et seq.) Hence it is impossible, with our present imperfect knowledge, to lay down any rules for guiding us in the choice of odours for the healthy or for the sick. There is a prejudice, however, against the odours of the order liliaceæ and the alliaceæ, as having a "faint" or sickening influence, whereas those derived from the labiatæ, including thyme, lavender, mint, &c., are regarded as being reviving and refreshing. It will, therefore, be well to avoid the former class when choosing cut flowers for a sick room, and in any case to discourage the continual permeation of scents into its atmosphere. The same objection will apply in a less degree to growing flowers in conservatories or gardens with which dwelling rooms communicate. Certain kinds of

* Dr. Hippol. Cloquet (op. cit. pp. 92 et seq.) gives numerous instances of the injurious influence of the emanations from flowers. In some of these fatal syncope has been said to have been caused by the air of bedchambers being impregnated with the odours. The following are the species which, according to this author, are most deleterious: the lily, nerium oleander, malva moschata, lobelia longiflora, magnolia tripetala, magnolia glauca, roses, saffron, orange flowers, musk. The following are less dangerous, but still hurtful to susceptible persons: narcissus, tuberose, violet, elder flowers, betonica officinalis.

scents having an exciting tendency, such as the rose, musk, clematis, and heliotrope, it is well for delicate people not to expose themselves too much to their influence. Each individual, however, will have to find out for himself or herself what particular scents are to be avoided, and it is not always safe to indulge in perfumes that are simply agreeable, if their tendency is found to conduce to excitement of the nervous system, or of any particular organs, the repose of which it is thought desirable to secure.

Whether the sense of smell may or may not be improved by *cultivation* is an important matter in reference to hygiene. That it may be deteriorated by abuse it is hardly possible to doubt. Great snuff-takers often lose the sense of smell for delicate odours, in consequence of the irritation and perhaps inflammation set up in the olfactory mucosa. It is also probable that constant exposure to bad odours, while it undoubtedly deadens the sense of disgust at the time, *may* cause a callousness to *all* odorous impressions. By those therefore to whom acuteness of smell is a matter of importance, unwholesome or disgusting smells should be constantly avoided. Every one must have experienced in his own person how much greater is his acuteness of smell, after having been in the open air for some time, as compared with his perception of odours after sitting in a close or ill-ventilated room. Hence, in testing the purity of the air of a dwelling-house, we should come into it fresh from a country walk or from some occupation in the open air. Hence, too, the danger already alluded to to those dwelling in a foul atmosphere; the very fact of their having constantly inhaled the ill-smelling gases makes them insensible to their disgusting and dangerous nature. The lay or medical visitor to a fever-stricken household will often detect by the nose the cause of their disease, without any more subtle analysis or inquiry into the sanitary arrangements of the house. And here it is worth noticing that some of the gaseous products of prutrescence are present in the atmosphere so as to be perceptible to the nose, though chemical analysis would fail to detect them. Sulphuretted hydrogen in

the proportion of one part to a million is distinctly perceptible. Ammonia is perceptible in the proportion of 1 to 3,300. $\frac{1}{3000}$ of a grain of phosphuretted hydrogen spread out on the surface of smell causes a distinct sensation; of sulphuretted hydrogen, $\frac{1}{30000}$ of a grain also is distinctly perceptible. (Valentin.)

If this is the case with gases whose presence in larger bulk can be demonstrated by chemical analysis, it is fair to assume that animal and vegetable odours of a deleterious kind may in like manner be recognisable by a well-trained and educated olfactory apparatus. Many persons declare that they can detect the small-pox by the peculiar scent of the sick person affected by it. It would be a most important aid in diagnosis if the various animal odours peculiar to diseases could thus be detected. The breath in scarlatina has a very remarkable odour, which I think is almost characteristic. In some cases of diabetes the breath has a sweet sugary odour. In cases of extreme hectic from profuse suppuration the breath is affected with this sickly-sweet odour. It is impossible, however, to frame any useful guide for the detection of disease by the use of smell, until we have arrived at a scientific theory and classification of odours, and at present the prospect of attaining this is still distant. The *nasus eruditus* may perhaps be as important an aid to diagnosis in the future of medicine and surgery as the tactus and the cultivated ear and eye have been in the past, and the sagacity of the physician or surgeon may depend on his appreciation of the odorous aspect of a case as much as upon its other physical signs. If it be true that a blind man can diagnosticate a black coat by the sense of smell, *à fortiori*, should a physician be able to recognise scarlatina or measles by the use of the same sense. Most people, however, can recognise without difficulty the fœtid and disgusting odour of putrescence, as distinguished from the less disgusting scent of mouldiness or mustiness. Dr. Dougall, of Glasgow, considers this distinction of great importance in regard to the dangers of gaseous emanations from decaying substances. The putrid odours he thinks far more indicative of

danger to health than the mouldy odours. "Judging," he says, "from the manifestations of putrescence and fermentation, it is obvious the latter is harmless compared with the former; while their æsthetics are as different as their influence on health. Putrid matter evolving noxious effluvia for nearly twelve months must be more hurtful than fermenting matter almost odourless and fully decomposed in about four months." Some difference of opinion may be held in reference to these views. It is probable that the offensiveness of an odour is in itself an indication of the noxiousness of the gases evolving it; but whether it is safe to conclude that fermentation processes and the resulting to—rulæ and fungi—if free from putrescent odours, are therefore comparatively harmless, is a doctrine the truth of which cannot be accepted without more satisfactory proof. Zymotic diseases in their mode of propagation have so close a resemblance to the process of fermentation, that there has arisen a prejudice against all analogous forms of decay. May it not be that some of the epidemic diseases are propagated by fungoid growths, the product of a kind of fermentation process, and that their insidiousness and rapid spread may be due to the very circumstance of these fungoid growths or organisms being odourless, and therefore giving no warning of their approach? May not cholera be spread by some such odourless fungoid growth, wafted in the air from place to place? May not malaria be another instance of the same kind?

One conclusion of Dr. Dougall's is of the the utmost importance, in a hygienic point of view, in reference to deodorising putrid substances. It is not sufficient to deodorise putrefying organic matter, if we wish to render it harmless. "Putrefaction may be impeded, arrested, or neutralised, or the odour neutralised or masked, and yet any zymotic poison present in all probability be unaffected, preserved, or only made dormant for a time." Carbolic acid will not destroy the inoculability of vaccinia, and it may therefore be powerless against more formidable poisons. Hence the mineral acids (and of these sulphurous acid is the best) should be employed for disinfecting purposes. These acids

and chlorine are highly antizymotic as regards vaccinia, and therefore *à priori* of other contagia and infecting poisons.

Subsection 2.—*The Function of Smell in its relation to Medico-legal questions.*

In medico-legal inquiries the sense of smell is often a source of the most important evidence. For instance in cases of poisoning by the volatile narcotics, such as alcohol, ether, chloroform, or bichloride of methylene, the odour of the breath of the patient when he is first seen lying in a comatose condition has often enabled the medical witness to distinguish between the coma of narcotic poisoning, and that of apoplexy. After death the odour of alcohol can be detected in the stomach, in the ventricles of the brain, and in other serous cavities. It has been stated that in one case the fluid of the ventricles of the brain had the smell, taste, and inflammability of *gin* (Pereira, "Mat. Med.," vol. ii, p. 1951). When the more volatile narcotics have been taken it is still more important to observe the smell of the breath during life, the odour often disappearing after death. The *odour* of *hydrocyanic acid* is relied upon, when confirmed by several independent witnesses, as being an extremely delicate test of its presence. But it is said that an odour somewhat resembling it is commonly noticed in the normal brain. If, however, on post-mortem examination the smell of prussic acid is perceived in the stomach there can be no doubt of its actual presence. It is not affirmed or imagined that the stomach itself, or any of its ordinary contents, ever has the odour of prussic acid.

The breath of patients who have taken a poisonous dose smells strongly of the acid, and in the case of this highly volatile poison, evidence of its presence during life is immensely more important, both as an indication for treatment and for medico-legal purposes, than any testimony afforded by a post-mortem examination.

Oil of bitter almonds has an odour peculiar to itself, though

thought by some to resemble that of prussic acid. The breath of persons poisoned by this oil is strongly tainted with the smell of almonds, and after death the tissues emit the same odour. *Cherry laurel water* has the same smell and contains also prussic acid. In a celebrated poisoning case, that of Sir Theodosius Boughton, a man of 20 years of age, the evidence afforded by post-mortem examination was almost valueless. The conclusion as to the cause of death was based chiefly on the fact that the draught taken by the deceased *smelt strongly of bitter almonds,* and that two minutes after he had swallowed it, symptoms followed closely resembling those of poisoning by prussic acid, and speedy death resulted, the age of the deceased being inconsistent with the theory that it was caused by apoplexy.

Opium and many other vegetable narcotics, as for instance, *belladonna* and *tobacco,* may be recognised by their peculiar odours. The odour of *opium* is frequently detected in the breath of persons poisoned by it, and Barbier states that it may also be noticed in the urine and sweat (Pereira, "Mat. Med." vol. ii, p. 2120). Of the three physical qualities of this drug, viz., its brown colour, its odour, and its bitter taste, the *odour alone is characteristic;* and this may be detected after death in the stomach if it has been taken in a poisonous dose, though it may be masked by the odours of other substances present.

The *homœopathic concentrated solution of camphor,* recently added to the list of violent irritant poisons, may be detected by its powerful odour in the vomited matters and in the contents of the stomach in fatal cases. Poisonous *gases* of various kinds, and more particularly *sulphuretted hydrogen coal gas* and *chlorine,* may also be detected by the sense of smell.

On the other hand, some of the conclusions that have been based upon tests of smell in medico-legal investigations have been proved to be groundless, or at least suspiciously uncertain. Thus Barruel proposed to distinguish the blood of different animals by the characteristic odour emitted on the addition of strong sulphuric acid. But, as Dr. W. A. Guy remarks, it would

be unsafe to lay any stress upon evidence derived from so uncertain a sense as that of smell, unless it were used as merely corroborative of other tests. Barruel's theory was found in practice to lead to no reliable results. For, though in one case it was asserted that a stain, supposed to be human blood, emitted the odour of human perspiration, when treated by the addition of strong sulphuric acid, yet in the case of another stain treated in the same way, the evidence given by skilled witnesses was too conflicting to be of any value. The sense of smell is in some persons so much influenced by the imagination, that it is not likely that it can ever be utilised as a source of evidence in a court of law, excepting in cases in which it is corroborative of other facts or observations by independent witnesses. It is possible that subjective sensations of smell may in some cases lead to erroneous conclusions, and a heated or morbid imagination has been known to give the sensation of burning brimstone when no such odour has been within the range of the senses.

In cases of suspected poisoning, the question may arise whether it is possible to saturate substances such as bran, or articles of dress, or bouquets of flowers, with some subtle poison the odour of which will act deleteriously upon the person who smells the article so infected. This question has been carefully investigated by Orfila ("Toxicologie," vol. ii, p. 543), who has come to the conclusion that such methods of poisoning are impossible. In the middle ages it was commonly believed that poisons were thus administered; and the sudden death of a great prince or potentate was almost invariably attributed to the use of poison in this way.

The influence of many odorous substances on persons susceptible to it is well known—vomiting, syncope, convulsions, and even coma, having been apparently caused by the impression on the olfactory sense in highly nervous persons. The knowledge of this fact has no doubt led to the popular belief in the possibility of a poison having been designedly used in certain cases. But it is now clearly ascertained that powerful

odours only affect people in delicate health, or those with a peculiar idiosyncrasy, and that only a few odours are capable of affecting each such individual, two persons being rarely affected in the same way or by the same odorous substances or emanations.

APPENDIX OF CASES.

LIST OF CASES.

Cases Illustrating Affections of the Mucous Membrane of the Nose.

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APPENDIX OF CASES.

Cases I to IX—Illustrations of Diseases of the Mucous Membrane of the Nose.

CASE I.

Dr. G. Johnson's Case, reported in "British Medical Journal" in May, 1874.

A gentlemen, twenty-four years of age, consulted me on account of an obstruction of the right nostril, which had existed for two years. On examination with the mirror, the posterior opening of the right nasal fossa was seen to be obstructed by a globular tumour (fig. 4), as large as a full-sized marble, and of a yellowish-green colour. I asked my colleague, Mr. John Wood, to devise a plan for removing the tumour. He introduced a slender curved polypus-forceps through the anterior opening of the nostril, and grasped the tumour, which burst, and discharged a glairy fluid, like white of egg. The patient felt immediately that the obstruction was removed; and, on rhinoscopic examination, the shreddy remains only of the tumour were seen attached to the middle turbinated bone, which had before been concealed by the tumour (fig. 5). The tumour had evidently been a mucous cyst. This case occurred ten years ago; and I heard only a few days ago that there has been no return of the disease. The practical value of rhinoscopy in this case can scarcely be questioned. It is doubtful whether, by any other mode of examination, the position and nature of the tumour could have been determined with sufficient certainty to warrant an operation for its removal.

CASE II.

EPISTAXIS.

Mr. Banks and Dr. Cregern's Case.

An unusually obstinate case, successfully treated by the injection of an astringent spray through the nares, from *Liverpool Medical and Surgical Reports*, October, 1868:—

"In September, 1867, Miss E. M., aged twenty, began occasionally to

spit blood, having for several months previously suffered at intervals from bleedings from the nose, which, however, were so slight that she never even told her parents about them. She spat up the blood on the slightest exertion, but yet her general health was very fair ; she did not emaciate, the menstrual function was regular, and stethoscopic examination revealed no evidence of disease of the lungs ; in short, it was difficult to say positively where the blood came from. In the early part of this year she again had some severe attacks of epistaxis, which she said nothing about, for fear of being kept in the house and 'invalided,' but one day in March she had a severe attack, in which such a quantity of blood was lost that syncope ensued. The bleeding recurred thrice in the same day, and the usual remedies proving useless, her medical attendants plugged the nares very thoroughly. Strange to say, even while the plug was in, she vomited blood which had evidently been swallowed. The plug was removed, and all kinds of styptics were employed, together with rest, proper diet, and internal remedies, such as digitalis, aconite, &c., calculated to moderate the force of the circulation, but in vain. For more than a month she had attacks of epistaxis and vomiting, from two to four times every week, till she became utterly exsanguine, as the quantity of blood lost each time was very great. In the end of April she came under Dr. Cregern's care, who had her removed to New Brighton, in the hope that change of air might do good. She was by this time quite blanched, her appetite indifferent, her heart extremely irritable, and herself so weak that she could not be taken out of the carriage to cross the river, and it had to be taken over in the boat with the patient in it. It was now pretty clear that the blood came from somewhere at the back of the tonsils and *upper part of the pharynx behind the soft palate*, and the difficulty was how to reach this. From some remark of Mr. Banks, Dr. Cregern was led to employ the spray, using tincture of perchloride of iron as the styptic. It was applied through the nostrils in the usual way, and seemed to do good, as there was no bleeding for three or four days. Then occurred some slight vomiting of blood, and afterwards, on May 14th, during one of Dr. Cregern's visits, the patient was seized with an attack of epistaxis so severe that it was with difficulty she rallied from it. The pupils were dilated to the utmost and insensible to light, and the patient became slightly delirious, tossing her arms about and muttering incoherently. The blood which ran from the nose was of the colour of sherry, and so devoid of fibrine that it would hardly coagulate. Dr. Cregern tried to throw the spray up behind the soft palate, but she could not endure it. It was clear, therefore, that by the usual plan of throwing the spray up one nostril and down the other, the soft palate prevented its reaching the proper place ; and, as she could not bear it when applied to the throat, Dr. Cregern adopted the plan of putting the tube up one nostril, closing both the other nostril and the

mouth, and then rapidly blowing in about a drachm and a half of the perchloride of iron with the spray-producer. The valve action of the palate being thus destroyed, the iron reached the very top of the pharynx and ran down, drenching all the surrounding parts; the patient could feel it running down. This was done every day for a fortnight; she did not lose a drop of blood during that time. Dr. Cregern then began to dilute the perchloride of iron, when, in a day or two, she began to hawk up a little blood, and he again resumed the full strength. The spray was continued till July 22nd, and for some time it was noticed that whenever it was discontinued the patient felt symptoms of fulness in the head and throat, which always preceded an attack of bleeding. At the end of that time she was well enough to take carriage exercise, and was recovering strength. She accordingly went to Cumberland, and had no hæmorrhage for a long time. She quickly recruited there, and has never since had a return of her malady. To the effectual application of the perchloride of iron to the proper place, Dr. Cregern justly attributes his patient's recovery, as, previously to this, every possible means had been vainly tried, by several medical men as well as by himself, to stop the bleedings."

CASE III.

A Case of Polypus of the Nostril, under the care of the Author at King's College Hospital.

Mrs. ——, aged thirty-six years, applied in June, 1864, with a polypus of the nostril (right). The disease had existed for some years, and she had had the polypi removed many times at short intervals at Charing Cross Hospital, and once four months previously by Mr. Watson. It presented as an opaque yellow substance nearly occluding the nostril. It was seized by the polypus forceps, and removed in the usual way by avulsion. When removed it was of the size of a Brazil nut, and about the same shape, having the upper part translucent and similar to the simple mucous or gelatinous polypus, but having an opaque yellowish aspect at the lower or presenting part. The pedicle was broad and thin. This operation having been performed on January 25th, a second polypus presented on February 1st, and was removed in the same way on February 3rd, after which there was very free bleeding, which lasted several days. The nostril remained free from obstruction till July 18th, when it was again cleared by tearing away the growth. It appeared to be attached to the upper and outer part of the nostril, and presented an opaque white aspect in the greater part of its extent, but at its upper part it has still the characteristic translucency of simple gelatinous polypus; the more opaque parts have here and there a dark colour, and the aspect of recurrent fibroid disease. It was in this state of the case that the

miscroscopic examination of the growth was made by Dr. John Harley, the particulars of which are detailed in the text. The further history of the patient cannot be obtained, as after this last operation she did not return to the hospital ; but it is extremely probable that a recurrence of the disease took place.

CASE IV.

A Case of Erosive Syphilitic Ulcers of the Nostrils and Alæ Nasi: Treatment by Iodide of Potassium and applying the Solid Nitrate of Silver, under the care of the Author.

Mr. G. D., an artist and man of letters, aged thirty-eight years, came to me in January, 1865, with tertiary serpiginous ulcers just within the left ala nasi.

Eight years previously he had a primary chancre, and has had secondary eruptions, for which he took mercury. Lately he has been smoking and drinking very freely, and his general health has suffered in consequence of his late hours and the great strain on his system from literary work at night.

The left ala is much swollen and erythematous, and inside the left nostril are several ulcerated patches covered with scabs, and with red swollen edges.

At first the cachectic appearance of the patient induced me to treat him with tonics (steel and mineral acids) and with soothing local applications. In the course of three weeks, however, the ulcers were evidently spreading, their edges were swollen and tuberculous, and the whole nose red and inflamed. He was still smoking to excess and drinking a good deal of whisky.

He now began iodide of potassium and decoction of sarsaparilla internally, and the solid nitrate of silver was applied to the edges of the sores. In another fortnight a very marked improvement in the aspect of the case was noticed. The ulcers on the outside had quite healed ; those within were no longer spreading. His general health, too, had much improved. He continued the iodide and sarsaparilla for some months, and on September 15th the discharges had all ceased, and the ulcers quite healed. The septum had unfortunately become perforated by an ulcer of about the size of a fourpenny piece. The lower part of the nose was slightly flattened, but was not deformed to a noticeable extent.

This gentleman subsequently suffered from periostitis of the orbit, from which he recovered very rapidly under full doses of iodide of potassium.

CASE V.

Mr. Cæsar Hawkins' Case of Ozæna treated successfully by Mercury. (*"Contributions to Pathology and Surgery," Vol.* i, p. 229.)

"Sometimes a cautious employment of mercury may be required, when it does not yield to other remedies, but its effects must be very carefully watched. . . ."

A little child, aged six months, was brought to me. It had not grown since its birth; a more miserable object, indeed, could scarcely be seen. Ulceration and discharge from the nose had commenced when the child was six weeks old, and had totally destroyed the septum and much of the upper part of the nose, so that it was quite flat on the face, and hardly had any orifice for breathing and for the escape of the copious purulent secretion that was present. About a month previous to my seeing it, a few stains had appeared about the thighs, not having, however, at all the usual colour of syphilitic eruptions; nor could I discover that either the father or mother had had any disease of the kind. The father had died, under my care, of erysipelas about a fortnight before. As the most probable means of saving the child's life, however—by stopping the disease suddenly and increasing the chance of absorption of chyle—I gave it half a grain of calomel and some compound cinnamon powder three times, and, in a short time, twice a-day, with some nitrated quicksilver ointment to be applied to the nostrils; the consequence of which plan was, that (without, of course, any evident mercurial effect) the ulceration nearly stopped, and the discharge was almost gone, and the child had grown more in three weeks than in the whole six months previously, the deformity, however, being of course irreparable.

CASE VI.

Neuro-Paralytic Ulceration of the Nasal Mucous Membrane, under the care of the Author. (*Abstract published in "Medical Society's Proceedings" for* 1871-2-3, p. 134.)

Elizabeth C——, aged forty-one years, was under the care of Mr. S. Watson in 1873, suffering from complete palsy and anæsthesia of the right side of the face, due to intracranial disease involving the fifth and seventh pairs of cranial nerves. She is married, but has no children living, two of her children having been born dead, and two others living only a few months. Six years ago she had a severe confinement, during which she flooded very severely and was insensible for three weeks. Her mouth was drawn at this time, and she has been deaf ever since. The right eye began to be inflamed only three weeks or a month ago, when she thinks she caught cold in it. There is pain in the right side of the nose and right

temple, and in the jaw of the same side. She has frequent bleeding from the right nostril, and sanious crusts form within it. There is incomplete anæsthesia of the right forehead and cheek, but the difference between the sensibility of the two sides is very marked, and she complains of numbness. The cornea of the affected side has the characteristic sodden appearance of neuro-paralytic inflammation. The muscles supplied by the portio-dura of the seventh, and by the motor division of the fifth, are completely palsied.

Under treatment chiefly directed towards the protection of the cornea from external irritation, at the same time supporting the tone of the nervous system, the ulceration which appeared in the cornea healed, but not before it had perforated and caused a synechial attachment of the iris to the cicatrix. Meanwhile there was a superficial ulceration of the mucous membrane just inside the nostril, which seemed at first to be spreading, but soon scabbed over and remained in an indolent condition, now scabbing and again breaking out, for many months. Bleeding every now and then became very troublesome.

On October 6th she began using finely powdered tannin as a snuff, but this did not entirely arrest the bleeding nor the ulceration.

On October 27th there was still an excoriated surface at the junction of the mucous membrane and the skin, for the extent of about one inch in diameter, with a ragged and irregular outline.

In January, 1874, she had an abscess in the arm of a scrofulous aspect. The cornea remained soundly healed, but there was no improvement in the condition of the face so far as regards the palsy. On one or two occasions treatment by iodide of potassium has been tried, but it has always had such a lowering effect after about a week's trial, that it has been found necessary to discontinue it. The ulceration of the nostril was not extended.

November, 1874.—Within the last two months the excoriations of the nostril have occasionally shown a disposition to spread, and whenever this has been the case there has also been some amount of swelling and redness of the tip of the nose and the right ala. The application of zinc ointment to the ulcers, with cotton wool externally, has appeared to have a very beneficial effect; and for several weeks the skin and mucous membrane have been quite sound.

This patient cannot smell on the right side.

CASE VII.

Mr. Jno. Wood's Case of Rhinoplastic Operation.

J. P., aged twenty-three, was admitted May 28, 1873, with destruction of the entire nose, the result of lupoid ulceration.

Six years ago ulceration of the soft palate set in, which was arrested by nitrate of silver. A year after this a fresh patch of ulceration appeared on the left nostril, which, in spite of treatment, spread to the right side. This was attended with little pain. Soon after he was taken into the Bristol Infirmary, where chloride of zinc was applied with some success. The ulcerative process had, however, entirely destroyed the alæ, and small portions of necrosed bone were repeatedly coming away from the interior. The septum at that time was unaffected. After the lapse of one year from his discharge from the Infirmary, there was a recurrence of the ulceration in the skin over the bridge of the nose, between the eyes, which extended deeply very fast. The septum then necrosed and was removed. No history of syphilis ; no family history of importance ; father, mother, and sisters alive and healthy. The patient is of a strumous habit, and is a native of South Wales. The whole of the nose has disappeared ; skin, cartilage, and the following bony structures :—the nasal bones and the lachrymal, the nasal process of the superior maxilla, the lower turbinated, the vomer, and the whole of the ethmoid with the exception of the cribriform plate,—so that a chasm is left extending back to the muscles of the soft palate, which can be seen in action during deglutition. All sense of smell is lost. The interior of this cavity is covered by a scab, on removing which an irregular suppurating surface is brought into view. The lower opening of the lachrymal duct is visible on either wall. On the upper lip a little to the left is a white cicatrix, the result of some of the previous ulceration.

June 7.—Chloroform was administered, and Mr. Wood performed the first operation, which consisted in making a columna for the new nose, and also in bringing the cheeks closer together, and thus diminishing the size of the opening. (The integument of the cheeks and forehead is fortunately very lax in this patient.) Two vertical cuts were made through the upper lip, so as to leave the central portion free, about five-eighths of an inch broad ; this was turned up. The lateral portions of the upper lip were then brought together by harelip-pins. The upturned portion of the lip was then split from below upwards, so as to make the mucous and cutaneous surfaces continuous and facing inwards, the raw surface looking outwards. Then, having dissected up the cheeks from their deep attachments on either side for a distance of about an inch and a quarter, and having pared their edges at the lower part, Mr. Wood easily brought them together in the median line across the lower part of the chasm in such a way that their deep raw surfaces should be in contact with the raw surface of the upturned flap. The parts were held in position by wire sutures, and tension was taken off the flaps by a stout harelip-pin, which transfixed both cheeks.

11th.—Pins removed from upper lip. Perfect union has taken place. Flaps look healthy and are also uniting.

16th.—The cheek-flaps have firmly united in the median line. Pin transfixing them removed.

23rd.—Mr. Wood has inserted below the edge of the united cheek-flaps two small rolls of adhesive plaster, one on each side of the base of the upturned flap from the lip, so as to form openings for the future nostrils. A slightly projecting incisor tooth has been removed. There has been some œdema about the lower lid of the right eye, but it has now disappeared. Since the operation the patient has regained to some extent the power of smell.

July 2.—Two portions of skin about half an inch square from the newly formed flaps immediately over the openings of the future nostrils were respectively reflected and turned in, being kept in position round these apertures previously made raw, in order by the presence of integument to prevent their too great cicatricial contraction, and possible subsequent closure.

August 6.—Third operation.—A flap with broad pedicle was taken in the usual manner from the forehead, and twisted down—the edges of the opening having first been pared, and the integument covering the newly-formed flaps over the lower part having been dissected from below upwards, so as to expose an extended raw surface on which to implant the forehead flap. Deep and superficial wire sutures were used to keep the parts *in situ*. Warm-water dressing to flap.

8th.—Transplanted flap looks well ; no sloughing.

11th.—Some of the wire sutures removed.

18th.—The new nose has united firmly except for an extent of one inch opposite the inner canthus on either side. Wound in forehead granulating vigorously.

21st.—Pedicle of flap divided to-day, a good-sized vessel supplying it being cut, which had the effect of making the nose feel cold and look slightly congested. At the same time an attempt was made to close the chinks on either side between the eyes. There was great difficulty in doing this, as the destructive process had stopped just short of the lachrymal sac, which was only thinly covered by skin ; but by carefully paring the edges, they were brought together by wire sutures. Warm-water dressing to be kept constantly applied to nose.

25th.—Wire sutures removed. Circulation in nose quite established, but there is a slight superficial slough, about the size of a fourpenny-piece where the pedicle was divided.

September 1.—Only partial union has taken place at the sides of the new nose at the upper part : the opening on the right side is now half an inch in length, on the left nearly an inch. A piece of No. 10 gum-elastic catheter is contantly kept in each nostril, the openings of which show a great tendency to contract. Throughout the stages of the operation the

patient's health has been remarkably good. There has been some inflammation of the conjunctivæ, which yielded to the application of astringent lotions. Wound in forehead quite healed. It is interesting to observe that if the point of the nose be touched with anything, such as the end of a pencil, the patient, with his eyes previously and still closed, when told to place his finger on the part irritated, will immediately raise his hand and put his finger on the cicatrix in the forehead.

October 4.—The openings on either side of the nose still remain, and to-day Mr. Wood pared the edges of that on the left side, and brought them together with wire sutures.

11th.—Wire sutures removed. Union has taken place. Opening on left side completely closed.

22nd.—Operation for closing the opening on the right side performed to-day in the same way as that for the left side. The difficulty seems increased by the fact that the patient has been accustomed to breathe through these openings, and therefore the air has a constant tendency to re-open the wound.

29th.—Wire sutures removed from right side. The opening is quite closed.



Fig. 33.

Result of Mr. Wood's Rhinoplastic Operation.

November 19.—Patient discharged, with directions to keep the nostrils open by inserting the catheter tubing. His sense of smell is now almost perfect. (Report in *Medical Times and Gazette*, December 27, 1873.)

CASE VIII.

Mr. Fleming's Case of Bloody Tumour of the Septum. ("*Dublin Medical Journal,*" Vol. iv, p. 17.)

A gentleman, aged 25 years, in hunting, when riding over a fence, was struck by the horse's head on the nose; at the moment there was considerable hæmorrhage from the nostrils, which soon ceased, and feeling little uneasiness, he continued the day's sport. Towards evening and during the night, a most distressing sensation of fulness and stuffing came on, which gradually increased, so as to entirely obstruct the nostrils. I was called to see him the following day; the outer parietes of the nose were generally swollen, slightly red, a little tender on pressure, but free from any appreciable contusion of the integuments. On throwing back the head, and gently pressing the tip of the nose, each opening of the nostrils presented a tumour, tense, shining, and of a dark purple colour, nearly filling its calibre: each tumour could be distinctly traced along its outer side with a probe, passing insensibly by a broad base upwards and backwards towards the septum; this appeared to form a partition between them, although a communication was suspected from the effects produced by the alternate pressure of the finger passed into either nostril—for by this means the tumour on the opposite side was fuller and more prominent. By the same manipulation, fluid was clearly ascertained to be present. From the extreme local suffering that was experienced, I felt myself justified in making an opening, and accordingly punctured with a lancet the tumour in the right nostril, having first rendered it as fixed and as prominent as possible; the result was satisfactory, being attended with almost immediate relief. A quantity of blood, half fluid and half coagulated, escaped, and by pressure both tumours were evacuated through the same opening and subsided gradually; a good deal of diffused hardness and tumefaction yet remained; but ultimately a complete cure was effected.

CASE IX.

Mr. Fleming's Case of Abscess of the Septum. ("*Dublin Medical Journa',*" Vol. iv, p. 22.)

A man of 40 years, ten days after an injury to his nose, with a superficial wound, but accompanied by free bleeding, found the wound becoming very tender, and the pain increased gradually and extended to the root of the nose, eyelids and lower part of the forehead. The nostrils became so stuffed as to completely prevent respiration through them, and there was general febrile disturbance. Two tense shining tumours were now found blocking up the nostrils. That in the right nostril was opened,

and a large quantity of thin purulent matter escaped, and on its evacuation both tumours subsided ; great relief was immediately experienced, and the man recovered without any exfoliation of bone.

Cases X to XXVII—Illustrations of Diseases and Injuries of the Frontal Sinuses.

CASES X, XI.

WOUNDS OF THE FRONTAL SINUSES.

Mr. Guthrie's Cases.—Guthrie's "Commentaries on Surgery," pp. 373, 374. (*6th Edition.*)

The danger of injury to the frontal sinuses has been greatly exaggerated, and vanishes in a great degree when attention is paid to their structure. The uncertainty of the depth of the cavity between the tables of the bone, and the irregularity of the exposed surface of the inner table, which may through carelessness be mistaken for depression, should be remembered.

A soldier of the 29th Regiment was wounded at the battle of Talavera by a ball which struck him on the lower part of the right side of the forehead, fracturing the external wall of the frontal sinus. On examination, the ball could be felt lodged in the sinus, whence it was readily removed by enlarging the opening, and the man recovered without any bad symptoms.

Case XI (op. cit. p. 374).—At the storming of Badajos, a soldier of one of the regiments engaged at the little breach was struck by a small ball about the size of a swan-shot; it penetrated the frontal sinus of the right side, and stuck in the inner table, the outer being considerably injured and splintered by the blow. The splinters having been removed, the small ball could be seen sticking in the inner table of the bone, whence it was easily extracted, leaving the dura mater bare beneath.

He was sent to Elvas, and recovered with a good and firm cicatrix.

CASE XIA.

Mr. Harrison's Case of Fracture of the Skull involving the Frontal Sinus. Emphysema. Recovery.

A boy, aged fifteen, was admitted under my care in November, 1867, having fallen down a ship's hold. On admission, he was suffering from symptoms of concussion. The right forearm was fractured just above

the wrist, and the forehead severely contused. When I saw him the following day, he had partially recovered his sensibility. The swelling extended from the root of the nose beyond the frontal eminences ; the margins of the swelling gave on pressure the peculiar crackling sensation characteristic of emphysema, whilst the centre was extremely tense and tympanitic. In the course of three weeks he was sufficiently recovered to be able to leave the hospital ; the swelling had materially lessened, and we were able to feel very distinctly the aperture by which the air had escaped from the sinus. The anterior wall of the right sinus had been completely driven in, leaving a well-defined circular opening, into which the tip of the little finger very nearly fitted, and through which, on each expiration, a visible impulse was given to the air still remaining beneath the skin.

I have noted this case, as it is, I believe, comparatively rare to meet with such a condition at so early an age.—(*British Medical Journal, November* 27, 1869.)

CASE XII.

Mr. Lawson's Case of Gunshot Injury of the Frontal Sinus.—(From the Medical Times and Gazette, April 25, 1874.)

F. J., aged twenty, an engineer, was admitted into Broderip ward, March 22, 1874, suffering from the effects of a bullet-wound of the frontal sinuses.

History.—The patient had been all his life very eccentric in his habits ; and on one occasion, having threatened to drown himself, he was sent to Hanwell Asylum, where he remained for six months. On March 21 he bought a piece of gas-piping ; having plugged up one end of it with a piece of boxwood, and filed a rough touch-hole in the pipe, he placed the whole in water, so as to cause the wood to swell and fit tightly. While this was soaking, he wrote to his friends, expressing his regret for what he was about to do. He then went on to describe his feelings while waiting until his cannon was ready, and towards morning of the 22nd said all was ready, and he had only time for one pipe. Then loading his cannon with powder and a bullet from some cartridges, he placed the breech against the wall, the muzzle to his forehead, and with a match fired it at the touch-hole.

When admitted he was unconscious ; surface cold ; pulse slow ; pupils acted on by light ; no paralysis. Blood was coming from a star-shaped wound in the forehead, just above the nose ; round the wound the skin was blackened ; the interior of the wound was a mass of *débris*, consisting of the bullet, pieces of bone, and clods of blood, at the bottom of which could be seen the brain pulsating.

The patient recovered consciousness soon after admission ; the wound was then enlarged, and, by means of a trephine, two semicircular pieces of bone were removed, one from the lower, and one from the upper part of the wound in the bone, leaving an opening large enough to allow of the bullet and the loose pieces of bone being removed ; with the bone came away a small piece of the dura mater. A wet rag was placed over the wound, and the patient left quiet in bed. 9 p.m. : the patient answers questions rationally, but has been trying to get out of bed, and occasionally rambling. Pulse 104 ; temperature 100°.

23rd.—Patient quiet after a restless night ; answers questions when put to him ; passes his urine naturally ; is in no pain. The edges of the wound somewhat everted ; a portion of the brain uncovered by dura mater is pushed so far forward as to touch the outer edge of the bone. A piece of plaster lightly laid across the wound, which is dressed in the same manner as before ; pulse 92 ; temperature 99·4°. 9 p.m.: has been rather restless, with a tendency to ramble, but answers questions properly, and knew his friends when they came to see him. Pulse 104 ; temperature 101·2°.

24th.—Passed a quieter night ; answers questions rationally ; bowels not open ; takes light food well. The brain has protruded further forward ; and the wound is commencing to suppurate. Pulse 88 ; temperature 99·8°. Ordered a chop for dinner, and a castor-oil enema to clear the bowels. 10.30 p.m. : pulse 108 ; temperature 101·9° ; has been very noisy ; was given one-sixth of a grain of morphia subcutaneously.

25th.—Bowels well opened by enema ; slept well after two injections ; talks a great deal, but is very rational. Pulse 92 ; temperature 102·2°, 2 p.m. : still noisy, so six leeches were ordered behind each ear. 9 p.m. : has been quieter since he was leeched. Pulse 92 ; temperature 102·8°.

26th.—Was very noisy during the night, but became quiet towards morning ; is quite rational but very irritable ; wound suppurating freely. Pulse 100 ; temperature 99·4°. 9 p.m. : has been very restless, and was again given the morphia injection. Pulse 80 ; temperature 103°.

27th.—Slept during the earlier part of the night, but was more noisy towards morning. Wound is looking very much more healthy ; the brain has receded a little ; pulse 84 ; temperature 100°. 9 p.m. : patient very noisy and talkative, not delirious ; given one-sixth of a grain of morphia ; pulse 88 ; temperature 102°.

28th.—Patient had a very restless night ; is quite conscious ; is complaining of pain all over neck and chest. Wound is healthy, the edges are granulating and the discharge healthy. Pulse 80 ; temperature 100·4°. Was ordered pot. br. gr. xx and an aloes pill. 9 p.m. : was quieter after the draught, but is now more restless; given one-fourth of a grain of morphia. Pulse 84; temperature 101·8°.

29th.—Passed a quieter night. Pulse 84; temperature 101°. 9 p.m.: is now very restless. Temperature 101°. Injected half a grain of morphia.

30th.—Was quieter after the morphia, and is much better this morning. Quite rational. Wound looks very healthy and is beginning to unite. Pulse 92; temperature 100·2°. Ordered 20 grains of bromide of potassium every four hours until he becomes quiet. 9 p.m.: has been much quieter after three doses of bromide.

31st.—Passed a fair night, and is quite rational this morning. The angles of the wound have united, leaving a sinus in the centre, from which a quantity of yellow pus escapes. Pulse 104; temperature 100·2°. 9 p.m.: has had a quieter day with the bromide, which is now ordered every six hours. Pulse 84; temperature 100·6°.

April 20.—Has shown no brain symptoms from the commencement of his illness. He has taken a large quantity of food, latterly two chops a day, and is altogether very much better. The wound has nearly closed, but a small quantity of pus oozes away from the lower angle of it. The skin is sunken a little, and rises and sinks with the pulsations of the cerebral vessels.

CASE XIII.

Dr. G. Williamson's Case.—Gunshot Injury of the Frontal Sinus; Removal of the Ball; Recovery.—("*Notes on the Wounded from the Mutiny in India*," 1859, p. 11.)

Private Charles Brown, wounded at Cawnpore, December 6, 1867, by a musket-ball between the eyes into the frontal sinus; it was extracted forty-eight hours after. Several pieces of bone have come away.

July 12th.—The wound is now nearly closed, there being only a small aperture capable of admitting a probe in the centre of a small depression; bare bone cannot be felt, there is almost no discharge from it, and he is free from headache.

Sept, 11, 1858.—Duty.

CASE XIV.

Baron Larrey's Case of Effusion of Blood into the Frontal Sinuses.

Jacques Raymond, cuirassier, twenty-five years of age, received a kick from his horse over the right eyebrow and along the upper border of the orbit, the blow being so violent that the external table of the frontal sinus was broken into pieces, and the effect was loss of consciousness, so that the man lay on the ground as one dead. The next morning he was still insensible, the head turned to the left; the eye on the wounded side made, with the ecchymosed eyelid which covered it, a considerable projection.

A tetanic stiffness manifested itself in the entire right half of his body, which was icy cold. I went on with the dressing of the wound, which I enlarged considerably and in all directions; I extracted the most moveable of the fragments, as well as the numerous clots enclosed in the sinus. During the operation, blood escaped freely from the nose and from the incisions which I had made. Scarcely had this first dressing been finished, when Raymond recovered his senses and his reason.

Free suppuration of the wound of the forehead followed, most of the pus being discharged by the nose; the swelling of the eye and the ecchymosis gradually disappeared, but the patient was blind on the wounded side.

He recovered after suffering violent pain and very serious tetanic attacks, and only left the hospital, after a seven months' stay, to return some time afterwards. In the end he made a complete recovery.

CASE XV.

A Case of Injury of the Frontal Sinus. Fatal termination.—(pp. 92, 93, *of M. Demarquay's Work on "Diseases of the Orbit."*)

A young grenadier of the Horse Guards received, during some cavalry manœuvres, a severe kick from a horse, which divided the integuments of the right eyebrow and fractured the outer wall of the frontal sinus. Severe hæmorrhage followed the blow; the patient lost consciousness and the loss of all functions, sensory and motor; but some hours afterwards, when he came to himself, he complained of very acute local pains, and convulsive movements appeared in the lips and jaw. At my first visit I enlarged considerably the wound, which was contused, the parts being torn away from over the eyebrow; I afterwards removed numerous detached fragments of bone which were depressed towards the cavity of the frontal sinus. This operation facilitated the exit of a tolerably large quantity of black blood and clot which had accumulated. During the act of expiration, air escaped by the wound, and immediately afterwards blood flowed from the nose. After the wound had been dressed in the most simple manner possible, the patient was bled from the temporal artery and cupped at the back of the neck and between the shoulders; sinapisms were applied to the legs, and a low antiphlogistic regimen prescribed. During the first days the mental faculties appeared disturbed, the memory was entirely lost, the pains continued. Symptoms of delirium appeared and became very intense, and fever co-existed with the delirium. Very soon afterwards lethargic stupor set in, and the patient died in convulsions on the nineteenth day after the accident. A post-mortem examination revealed very extensive inflammation, with swelling of the mucous membrane of the frontal sinus and of the nasal fossæ, a crack scarcely

perceptible in the posterior wall of the sinus, with severe inflammation of the adjacent portion of the dura mater, and a sanguinolent and serous effusion between that membrane and the anterior right lobe of the brain.

CASE XVI.

M. Demarquay's Case of Abscess of the Frontal Sinus bursting through the Posterior Wall of the Sinus into the Cranial Cavity. (*Demarquay*, op. cit. pp. 86, 87.)

A man about fifty years of age was in the enjoyment of good health, when suddenly, and without known cause, the upper lid of the left eye swelled up to such an extent as to form a livid tumour, which reached downwards almost as far as the middle of the cheek. Feeling otherwise neither pain nor discomfort therefrom, he continued to go about as usual, and declined to use the remedies which were suggested to him. Called to him at the expiration of four days, I found the patient in a state of heaviness and drowsiness, unable to speak, and having lost the power of moving the arm, thigh, and leg on the right side. I observed in the middle of the left eyelid, which now presented scarcely any trace of swelling or redness, a small ulcerous opening which had formed twenty-four hours previously, and had given exit to an enormous quantity of pus, a few drops of which still issued when pressure was made on the sides of the opening.

I suspected that all this might proceed from an abscess formed in the orbit, which had made for itself a passage into the cranium, penetrating into it by the optic foramen ; consequently, to give the pus a ready means of exit externally, and to stop it from flowing back towards the brain, I enlarged the opening to the right and left. This incision did not produce a single drop of pus, and I could not ascertain either the centre of the abscess or the track which led to it. The entreaties of the patient's friends put an end to my exploration. I recommended that his head should be held leaning forward, in order that the pus should flow out with facility.

In the evening I wished to make fresh incisions and to explore the ulcer again, but all the friends of the patient, seeing him in a complete state of apoplexy and noting the rattling in the throat, were decidedly opposed to any further procedure. They were of opinion that it would be a crime to dissect in any way a dying man, and that henceforth all attempts of art to relieve him would be in vain. The following night the apoplectic condition ended in death.

Permission was granted me to examine the body, in order to ascertain the cause of death. I did this with as much minuteness as was possible in the presence of the friends of the deceased, preventing the dissection from too much disfiguring the body. Having dissected the skin from the middle of the left eyelid to the forehead, I discovered, immediately under

the upper edge of the orbit, an aperture close to the superciliary notch which penetrated into the left frontal sinus. A probe introduced by this opening entered directly for more than an inch before reaching the posterior wall of the sinus. Moved about in various directions on this wall, it penetrated the cranium by an aperture which traversed it ; this opening was situated opposite the external opening, but a little higher ; and, as far as I could tell, it had the same diameter. There was no other perforation in the posterior wall of the sinus, for the probe that moved over the whole surface was everywhere checked in its progress. As I directed the probe obliquely inwards it entered the right frontal sinus, not so large as the left, and imperforate as I had reason to believe. Both contained so much pus that on moving the probe about a decided sound of fluctuation followed, and a great quantity of pus ran out. In order to examine with more precision the seat of the mischief, I was about to saw through the skull-cap, but the crowd of people around prevented me. Having asked if they knew anything which could have caused the mischief, they told me that about two years previously their friend was endeavouring to break a piece of iron with a large hammer, and that the iron, flying up with force under the blow, struck him on the upper border of the orbit near the place where the aperture which I had just discovered existed ; since that time that the patient had very frequently complained of a dull pain in his forehead like that caused by a coryza ; afterwards that he had passed, by the nose, drops of pus. With this exception he had been fairly well in health, and had never been compelled to give up his work.

CASE XVII.

A Case of Abscess of Frontal Sinus opening into the Nostril. (*Demarquay*, op. cit. pp. 88, 89.)

A woman, fifty years of age, who had suffered from syphilis, had on the anterior part of her frontal bone a fluctuating and indolent tumour. Pressure being made on this tumour, and continued for some time, it caused it to empty itself ; a large quantity of pus then flowed from the nose. An affection of the frontal sinus, with destruction of the anterior wall of the sinus, was diagnosed. There were besides three exostoses of the arms and forearms.

This woman died from albuminuria, and at the autopsy the frontal sinus was found to be much dilated and full of pus ; its anterior wall was destroyed to a great extent ; around this perforation the osseous tissue was thickened and condensed. The diploe had disappeared, the entire thickness of the bone being made up of a compact and very hard tissue.

CASE XVIII.

The Author's Case of Necrosis of the Orbitar Plate of the Frontal Bone following an acute Abscess of the Frontal Sinus.

J. E. L. ——, aged thirty-two years, a perfumer's assistant, married, had always been in good health, never having had a day's illness, and never having had any venereal or other disease, till January, 1874, when he was suddenly seized with severe pain in the head, forehead, and across the eyes. He had not had any fall or injury, nor was he aware of anything having happened to him likely to have produced this condition. The pain he describes as having been so severe that he was unable to keep still for a moment, but "kept rolling himself about in agony." In a day or two this was succeeded by swelling, redness and heat of the forehead and eyelids, and it was supposed that he was suffering from erysipelas, and at length a swelling formed over the inner side of the right orbit, and at last broke. From the time of the outbreak of erysipelas, and up to the time that I first saw him in April, he was very frequently annoyed by the presence in his nostrils of some very foul-smelling discharge, but no bone had escaped. When seen by me, on April 29th, 1874, there was a swelling of about the size of half a walnut immediately under the inner extremity of the superciliary ridge, the skin over this being red and inflamed, and perforated near its centre by a sinus, from which a thick foul-smelling pus was constantly flowing.

On probing this sinus I found several pieces of bone lying loose in the frontal sinus. I therefore suggested that an operation should be performed for the removal of these sequestra. Bichloride of methylene was given, and the sinus was then enlarged and two fragments of bone easily drawn out. The larger of the two pieces was about three-quarters of an inch across, about the thickness of an egg-shell, and concavo-convex in form. Having compared the fragments with the bones in this region, they evidently came from the orbitar plate of the frontal at its junction with the inner extremity of the superciliary ridge. Very free arterial hæmorrhage followed the removal of the dead bone, but this was easily controlled by pressure. The cavity was dressed with dry lint.

In a few days all the swelling had subsided, and, by the use of carbolic acid lotion as an injection, all offensive odour was soon destroyed; healthy granulations sprang up, and the wound gradually contracted, leaving a depressed cicatrix, however, and a fistulous opening that only closed about the end of August or early in September. When seen in October no opening remained, the general health was very good, and there was no distortion of the eyelid, as I had at one time anticipated. He still occasionally notices an offensive smell coming into his nostrils from the part.

CASE XIX.

Case of Necrosis of the Frontal Bone following Abscess, under the care of the Author.

Thomas C——, aged twenty-six years, came to King's College Hospital under my care in May, 1864, with an ulcer occupying the left side of the root of the nose, and a swelling of that part of the forehead corresponding to the frontal sinus of the same side. A foul-smelling discharge had commenced nine months before to come down his nostrils, and had continued ever since. There was great tenderness over the frontal swelling. He denied ever having had syphilis. All his symptoms rapidly subsided after the escape of a piece of necrosed bone, that evidently formed part of the anterior wall of the frontal sinus.

CASE XX.

Chronic Mucocele of the Frontal Sinus.

Mrs. J——, aged forty-six years, a woman in fair health, was admitted a patient at the Central London Ophthalmic Hospital in October, 1870, with protrusion of the left eyeball and a swelling over the left frontal eminence.

The only account she could give of the origin of the swelling was unsatisfactory. She had had several tumours taken from her upper eyelid twenty years before, but the frontal swelling had only commenced three months before admission, October 25, 1870. The tumour is obscurely fluctuating and nodulated, and at the upper and inner angle of the orbit a lamina of bone projects over it in a pointed form. There is no surface discoloration. Vision is equally good with either eye, and there is no diplopia, although the eyeball is thrust forward in advance of its fellow and outwards towards the temple.

On January 26th, 1871, Mr. H. A. Reeves made an incision of an inch long below and parallel with the inner half of the eyebrow, and, having divided the orbital fat, punctured the protruding cyst that presented. Mucopurulent fluid escaped in stringy masses, and more freely when the cavity was injected with water. The cavity extended upwards into the frontal sinuses, and did not appear to be lined by any distinct cyst membrane; here and there spiculæ of bone and irregularly-shaped septa projected into the general cavity. A communication between the abscess cavity and the nostril of the same side was established by thrusting a director downwards and breaking through the thin membranous and bony septa that obstructed the free passage of the instrument. The wound was then plugged with carded oakum.

Free suppuration of the cavity ensued, and it diminished rapidly in

size, but the sinus at the inner angle of the orbit continued open for many months, and though it had closed by October, 1871, and the puncture seemed firmly cicatrized, yet a month later it had reopened. Strong iodine lotions were now injected, and in a few weeks the sinus again closed, and there seemed every prospect of the cavity having permanently contracted; but in July, 1872, it again opened, and the injections had to be again used. The eye remained in its displaced position up to the last time the patient was seen, but the sight remained perfectly good, and no diplopia was complained of. It was suggested that a seton should be passed down into the nostril, but the patient would not consent to undergo any further operation. There can be no reasonable doubt that, had a permanent opening into the nostril been established by the use of a seton, the sinus would have become permanently closed.

In this case there is no distinct history to guide us in tracing the etiology of the disease, but the character of the contents of the sinus, when opened, clearly point to there having been some accidental obstruction of the infundibulum, and the probability is that a catarrhal swelling of the mucous membrane at this spot was the principal, if not the only, cause of the obstruction, and the subsequent accumulation of mucus in the sinus.

CASE XXI.

A Case of Encysted Tumour of the Frontal Sinus.—(Recorded by Mr. Bellingham, of Dublin, in the "Annales d'Oculistique" of 1853.)

A man, forty-six years of age, had a tumour about the size of a lemon, situated on the forehead over the root of the nose and the region of the eyebrows. It extended from the middle of the right eyebrow across to the left temporal region, and pushed downwards and outwards the left eye, which it concealed in part. The tumour is not painful when touched, and the skin which covers it is not changed in colour. The centre and the lower part are soft, and give to the touch the feeling of fluidity; above and on each side along the base of the tumour one can feel a bony projection, which is prolonged a little over the walls of the tumour. The sight is not at all weakened, and the patient has never felt anything but a slight pain on the left side, near the base of the tumour.

In February, 1850, he presented himself at the Monaghan Infirmary, where Dr. Young punctured the tumour with a small trocar; a quantity of a thick liquid, about as much as would fill an egg, escaped. In the month of May a fresh puncture was followed by the same result. The patient was finally operated on on the 19th July. The tumour having been laid bare was opened, and several ounces of a viscid liquid escaped. This liquid was of a deep colour, and very like bile. It was proved that the outer table of the bone was completely absorbed, except towards the base of the

tumour, where a hard projection was to be felt. It was the same with the posterior table, and the pulsations of the brain were perceptible to the sight and touch. The patient recovered.

CASE XXII.

Langenbeck's Cases of Encysted Tumour, so-called Hydatid, of the Frontal Sinus.—(Mackenzie on "Diseases of the Eye," p. 16.)

A ploughboy of twenty years of age, eleven years before his admission to the hospital, had, while playing at tennis, received a stroke with a racket on the left side of the nose and on the left eye, the consequence of which was a great deal of swelling, which, after a time, completely disappeared. Two years afterwards he began to feel pain in the part, and observed a protuberance at the inner angle of the eye. When the patient came to the hospital, Langenbeck found the eyeball natural in form, the power of vision not affected, and the pupil lively. The eyeball, however, was pressed outwards and downwards by a considerable swelling at the inner angle of the eye. The swelling had *exactly the appearance and the situation of a greatly distended lachrymal sac*, but was considerably bigger than we almost ever find the sac, even in its state of greatest enlargement. That the swelling did not consist in an enlarged lachrymal sac, Langenbeck concluded from his not being able to empty it, no mucus or tears being evacuated from the puncta on pressure, and the tears being duly conveyed into the nostril without dropping upon the cheek. The patient's voice was similarly affected as that of one with polypus in the nose. The swelling communicated an obscure impression of fluctuation. At the inner side of the swelling, or towards the nose, it was bounded by a sharp edge of bone, which was felt exactly where the nasal process of the superior maxillary bone rises by the inner side of the orbit. As the surface of the swelling was not covered by any layer of bone, but felt soft and fluctuating, it was not easy to form a proper judgment regarding its seat, and one might have readily fallen into the error of regarding it as an enlarged lachrymal sac. Against such a supposition, no doubt, there was the remarkable displacement of the eye outwards and downwards. As the swelling also extended from the inner angle upwards and towards the frontal sinus, Langenbeck concluded that that cavity was the seat of the disease. Six months before he had extracted a large hydatid from the frontal sinus of a young woman, in whom the external table had been very considerably pushed forwards, and the orbitary process of the frontal bone so much depressed, that the eyeball lay opposite the point of the nose. In this case he had perforated the external table, and extracted what he terms an hydatid; after which the sinus appeared $2\frac{1}{2}$ inches deep. He was led then to suspect the same disease in the ploughboy, that the

swelling was contained in the frontal sinus, whence it had pressed itself downwards into the nostril, and at the same time had pressed the inner wall of the orbit outwards.

An incision being made from above downwards, close to the sharp edge of bone which was felt at the inner side of the swelling, and in such a way as to avoid both the lachrymal sac and the lachrymal canals, after the soft parts were divided, a white glistening sac came into view. On touching this with the finger, it was evident that it contained a soft mass. Langenbeck separated the swelling as much as possible; but as he found that it extended deep into the nostril, he opened it, whereupon there issued from it a greyish white tenacious substance. He cut away with scissors as much as he could of the sac and introduced his finger into the cavity. Its depth amounted to 3 inches. With the point of the finger he reached as far as the floor of the nostril. He could not reach the orbit, nor touch the eyeball. He felt from the diseased cavity the inner wall of the orbit, formed by the os planum of the ethmoid, a part of the orbitary plate of the frontal and the os unguis. This wall of the orbit, along with the lachrymal sac and nasal duct, was pressed outwards; hence arose the displacement of the eyeball, while the passage of the tears into the nose remained uninterrupted. Langenbeck introduced his finger up into the frontal sinus. He decided, therefore, that the disease had originated there, and had descended by the side of the nostrils. He could now see into a large cavity filled with a greyish tenacious mass, which he removed with his finger and a pair of forceps. This substance was contained in a shut sac, distinct from the mucous membrane of the sinus; and had it not been so, he thinks the substance in question would have made its way into the nostril. The swelling was not covered by bone at the inner angle of the eye. It must, therefore, either have made its way between the os unguis and nasal process of the superior maxilla, or have produced absorption of the latter. This is the more probable conjecture, as the edge of the nasal process felt so sharp. The tenacious substance which was removed was enough to fill a teacup.

CASE XXIII.

A Case of Polypi of the Frontal Sinuses, Antrum and Nasal Fossæ. (*Levret*, "*Observations sur la Cure de plusieurs Polypes*," p. 235. *Paris* 1749.)

In 1725 there died in Paris a lad of seventeen or eighteen years of age, who consequent upon small-pox, and for the space of three years, had been affected with polypi. There were seven of them altogether; in the nose, throat, maxillary and frontal sinuses. His appearance was hideous; his face enormously enlarged; his nose spread out to the usual width of the malar bones; and the upper maxillary bones greatly dilated. He had a

very considerable protuberance at the root of the nose; his eyes were almost entirely protruded from the orbits; the distance between them was at least twice the natural distance; and the tears ran over the cheeks mixed with pus from two lachrymal fistulæ. The palate was so much depressed that it lay upon the tongue; the lower jaw was not changed in size or form, but it was continually depressed, so that the saliva flowed uninterruptedly. At the entrance to the nostrils, two polypi were seen, which completely filled these cavities, as was proved by introducing a flexible probe, which could be passed around each of the polypi without meeting with any obstacle.

On dissection, the one superior maxillary bone was found to be at its middle as thin as the skin of an onion, while the other had already given way, so as to bring into view the thin and polished membrane enveloping a polypus about two inches in diameter, reddish and very elastic, loose at all points except towards the nostril, where it was attached by a slender pedicle. The two frontal sinuses were converted into a single cavity, occupied by two polypi, which united might have equalled the bulk of the one occupying the antrum. Each of them was attached by a slender pedicle, close to the excretory passages from the sinuses. The lining membrane of these cavities was thickened. The orbits were found to be diminished in size by the intrusion of the polypi; the eyeballs consequently displaced, the os unguis completely separated from the other bones of the orbits, and so pressed upon as to become convex instead of concave towards the orbitar cavities; and the bones of the nose separated from each other to the extent of several lines.

CASE XXIV.

Dr. Wuth's Case of Polypi of the Frontal Sinuses. (*Demarquay*, op. cit. pp. 100 et seq.)

A little boy, aged ten years, whose left eye had been diseased for nine years, was placed under the care of Dr. Wuth. The eye was completely displaced outside the orbital cavity in such a manner that it was on a level with the ridge of the nose. It was so prominent on the malar region that, looked at in front, it hid completely the side of the face. The displacement downwards was such as to place the eye in the same line with the tip of the nose. The eyelids during the last three years had covered less and less of the eye, and in fact they protected so little of it that the cornea and the sclerotic, for a space of three lines all around, were completely bare. A large and deep ulcer of the cornea threatened speedily to bring about the destruction of the eye. The frontal bone and the bones of the nose made a considerable projection in front. The eye had by degrees left its place, as the orbit was made narrower by the compression of the

bones which constitute it. The left side of the nose formed, with the ridge of that organ, a plain and level surface. The finger introduced into the left nostril was stopped by a resisting obstacle. The skin was stretched, the left eyebrow, widely separated from the right, was drawn down. This part of the integument was thickened and rough to the touch; below the external portion of the eyebrow there was a small opening, pressure over which caused a whitish mucus to exude. Dr. Wuth, convinced of the existence of a large polypus in the frontal sinus, proceeded to extract it in the following manner. He first made through the soft parts, commencing at the root of the nose, a vertical incision two inches long; secondly, another incision at right angles to this one was directed over the eyelid; thirdly, he dissected off the triangular flap thus formed, so as to be able to apply the trephine to the sinus. There was visible then, towards the middle of the superciliary arch, a small opening which indicated the source of the fluid we have mentioned. The enormous dilatation of the sinus made it necessary that two openings should be formed with the aid of a small trephine. An immense number of polypi then projected out; these were removed; the cavity where they had existed would contain three hen's eggs. The parts took a year to heal; the frontal sinus shrank in all directions, and the eye was partly restored to its proper position in the orbit. The ulcer of the cornea healed quickly; so early as the first night after the operation the patient slept as he had not done before for many years, and his health henceforward rapidly improved.

CASE XXV.

Sir William Wilde's Case of Supposed Polypus of the Frontal Sinus. (*See also a Case of Mr. Keate's of Hydatids between the tables of Frontal Bone*, "*Medico-chirurgical Transactions*," vol. x, p. 278.)

H. H., aged eight. The right eye is pushed outwards to the extent of three quarters of an inch, and forwards about half an inch. The hollow which should exist between the eye and nose is filled up by a somewhat flattened, rather firm substance, which fills up the inner angle of the orbit, and reaches forwards almost to a level with the nose. There appears, however, to be a sulcus between it and the nose. The skin over the tumour is red and congested, and the part is painful to the touch. The boy will not bear much pressure on it; and the tumour does not convey the idea of perfect solidity. *The right nostril is affected with polypoid growth*, and thickening and enlargement of the entire mucous membrane. There is considerable lachrymation, and the vision is only slightly impaired. There is considerable engorgement of the retinal veins, and the optic disc is red and indistinct. The only history is, that two years ago the eye swelled, and that the swelling has since increased. *It is probable that this is a case of polypus of the* FRONTAL SINUS.

CASE XXVI.

Dr. Stephenson's Case of Exostosis of the Frontal Bone invading the Orbit. (*"Edinburgh Monthly Journal," March*, 1858.)

Mrs. S. W., aged eighteen years. Three years before time of the consultation perceived a slight enlargement of the bone immediately beneath her eyebrow, which continually increased, but without any pain or constitutional disturbance.

When first seen it was over two inches in diameter at its base, and hung down like an inverted cone over the eye. It obstructed her sight mechanically. The tumour was removed by sawing through the bone above into the frontal sinus, and then separating it by the aid of strong cutting pliers. The *lining membrane was found thickened, and a very small fungus attached to it.* The wound healed up, and, though a fistulous opening remained for eighteen months, the ultimate result was most satisfactory. The levator palpebræ remained intact, and no deformity whatever was left three years after the operation.

CASE XXVII.

A Case of a Bullet lodged in the Frontal Sinus for twelve years. (*Demarquay*, op. cit. pp. 104, 105.)

The French General T—— received at Waterloo a bullet in the left orbit; after having destroyed the globe of the eye, it traversed the superior portion of the internal wall of the orbit, and lodged itself in the frontal sinus. It remained there twelve years without producing any effect; at the end of this time the General was aroused one night by the sensation that something had fallen down his throat. This was the ball, which the effort of coughing immediately expelled.

Cases XXVIII to XLVIII—Illustrations of Injuries and Diseases of the Antrum.

CASE XXVIII.

Dr. Fraser's Case of lodgment of a Foreign Body in the Antrum for eight years. (*"Edinburgh Medical Journal," September*, 1856.)

William Roberts, policeman, had the large coarse breech of a common musket in the antrum for eight years, where it lay unsuspected, though the

patient had been under various doctors, and though symptoms were ever present such as to warrant an effective search for some foreign irritant. It was removed by Dr. Fraser.

CASE XXIX.

A Case of Suppuration within the Antrum in a scrofulous Child, associated with Necrosis of the Alveolar Ridge, &c., under the care of the Author.

A child, aged five years, was brought to the Central London Ophthalmic Hospital on February 23, 1869, with an ulcerated aperture in the cheek opposite the left malar bone. The child had a very unhealthy scrofulous aspect, and the lower eyelid was completely everted by a cicatrix, the result of an old scrofulous abscess on the cheek, by which the eyelid itself had become in great part destroyed; the skin of the cheek being terminated at its upper part by an abrupt cicatricial adhesion to the lower margin of the orbit. The probe passed into the fistulous opening on the cheek, met with bare bone, and, when thrust on, entered the antrum. Inside the mouth the left superior alveolar ridge was found to have a bare, ragged and evidently necrosed surface opposite two of the molar teeth.

On February 26, the probe being passed into the aperture in the cheek, found its way through an opening into the mouth by the side of the molar teeth. Two of these teeth being found to be quite loose, they were extracted, and with them came away the necrosed portion of the alveolar ridge. This left a free opening into the antrum, from which a discharge freely escaped.

CASE XXX.

Dr. J. D. White's Case of Abscess of the Antrum, caused by a decayed tooth. (Reported in the "Dental Cosmos," and cited by Dr. James E. Garretson in his work on the "Diseases of the Mouth and Jaws," p. 423. Philadelphia, 1869.)

Mr. S——, aged twenty years, light complexion (peculiar whiteness of the skin, a characteristic of the family), had been complaining for some time of a fœtid discharge from the right nostril, of heat and a sense of tension in the right superior maxilla. He applied to his physician, who gave him a wash, with the belief that the parts would speedily return to their normal condition, he supposing the affection to be merely an increased discharge depending upon a slight local hyperæmia, the result, perhaps, of the bad state of the weather at the time. The parts, however, did not recover, the discharge became much more fœtid, and evidently was principally composed of unhealthy pus, though it was not as copious as it had been previously; the pain was not severe, but the heat of the parts more

elevated, and the sense of tension increased. The patient was irritable and pale; the heat of the body was rather above the average temperature. This was the condition of the patient when he came under the care of Dr. White.

Upon examining the anterior nares nothing could be discovered to account for the discharge, the mucous membrane being a little inflamed, but not sufficient to occasion it. A diseased state of the antrum was suspected, and the mouth was examined to ascertain if a diseased tooth could be the cause. The second molar, upper jaw, right side, was unsound; part of the crown was decayed away; the bulbous portion of the nerve and the filaments of the buccal roots were dead, but that in the palatine root was living, and occasioned the patient pain. A little arsenical paste was applied to destroy it. No sign of alveolar abscess was present in it or any other tooth; a careful inspection was now made, and important information was received. Upon examining the right nostril with a speculum, a little pus was seen in the middle meatus. The patient was requested to incline his head towards the left side; he did so, and upon looking at the parts again a large amount of pus was found. This, together with facts stated already in this paper, and that there was no other assignable cause of the discharge, were deemed sufficient to establish the diagnosis—abscess of the antrum, probably caused by the unsound second molar tooth.

Extraction was advised and submitted to. Upon the removal of the tooth no pus escaped. A probe was introduced into the alveolus previously occupied by one of the buccal roots, and readily passed on into the antrum; pus now followed the withdrawal of the instrument. The cure was completed on general principles. Dr. White concludes his description by remarking that this gentleman had repeatedly visited a *horse* belonging to his father which had a profuse discharge from the nose, and which was thought to be *glanders*. The horse's malady was prior to that of the patient, and, of course, could only have caused him to fear that he had contracted the disease from it.

CASE XXXI.

A Case of Abscess of the Antrum, associated with Polypi, under the care of the Author. (*Published in "British Medical Journal," July or Aug.*, 1868.)

J. M——, aged thirty-one years, a fruit and fish hawker, in good general health and well nourished, applied at the hospital on May 19, 1868, with a sinus and ragged ulcer situated near the lachrymal sac of the right side, but a little external to it.

History.—He said that he had for some time suffered from a watery eye, and that about Christmas last a swelling had formed in the region

now occupied by the ulcer, which was opened two or three months ago by a surgeon and proved to be an abscess. This sinus was probed on several occasions by this surgeon, and about a month ago a small piece of very thin bone of about half the size of the thumb-nail escaped from it. At or about this time a fœtid discharge commenced from the right nostril, and this had continued ever since. His sight was little or not at all affected.

Present Condition, May 29, 1868.—In addition to the ulcer and sinus there is a slight fulness of the upper part of the cheek and side of the nose, and the eyeball is thrust a little towards the temporal side of the orbit. There is little or no overflow of tears. A probe passed into the sinus finds its way easily directly backwards to the apex of the orbit, and reaches a depth of a little over three inches. On a subsequent probing the same sinus was found to communicate with the antrum and nostril. No bare bone was felt in either direction. The nostril is obstructed, and there is a very offensive discharge constantly escaping from it.

Treatment and Progress.—Injections of a lotion containing one part of tincture of iodine to five parts of water were used with the india-rubber-bottle syringe, and the effect was to cause a free flow of mixed lotion and pus from the right nostril. This was done twice or three times a-week till the morning of June 3rd, when he suddenly felt something in his throat and the posterior nares, which he managed to cough up, with much effort and almost choking in the attempt. The material which he brought up consisted of four or five dirty-white lumps of soft pulpy material, varying in size from that of a cobnut to that of a large walnut, and having the most abominably stinking odour. In the choking efforts to bring this up he swallowed some portion of the mass, after which he felt very sick, vomited several times, and was so much prostrated as to be obliged to keep his bed for the rest of the day. From this time, however, the sinus began to heal up, and by June 20th had quite closed. There was still a slight discharge from the nostril at this date, but his health had so much improved, and he suffered so little inconvenience, that he ceased attending the hospital.

The examination of the decomposed mass which had been coughed up gave no evidence of any structure whatever.

CASE XXXII.

M. Demarquay's Case of Tumour of Antrum simulating Abscess. (*See "Edinburgh Medical Review," October*, 1867.)

A man, aged fifty-three, had had a swelling in his left cheek for twenty years. This for long was only a deformity, but during the last

six or seven months had been discharging a large quantity of pus through fistulous openings into the mouth and through the sockets of several teeth that had been extracted, and through the hard palate.

M. Demarquay, thinking the symptoms were due to the presence of necrosed bone, attempted its removal, but found it impossible to do so. He therefore removed the whole upper jaw, and then found a bony tumour lying loose in the antrum, like the kernel of a nut in its shell, without any attachment to the bony walls whatever. It consisted of fibrous tissue with a large quantity of calcareous deposit in the interstices, and M. Demarquay suggests that necrosis of this tumour had taken place in consequence of the pressure on its supplying vessels caused by its own growth.

CASE XXXIII.

Dr. Garretson's Case of Abscess of the Antrum depending on the death of the pulp cavity of a Bicuspid. (*Garretson, on "Diseases of the Mouth and Jaws,"* p. 427.)

Mr. C——, late an eminent merchant, after five years of great mental and physical suffering from a disease, supposed to be malignant, of the antrum, was found to have simple muco-puruloid engorgement depending on a dead tooth. In this case the trouble had commenced with a feeling of heaviness and oppression in the body of the jaw; the parts had gradually enlarged, until finally there was distension of the cheek to the size of a large fist, the eye being thrown entirely out of position from the rising of the roof of the antrum. Much treatment had been given the case without the slightest accruing benefit. No attention, however, had been directed to the dental arch—the teeth, although the patient was sixty years of age, being apparently in the most perfect condition. The result of this case was the diagnosis, on the part of a surgeon, to whom he finally applied, of a dead nerve in one of the bicuspid teeth; the organ, although as healthy-looking as any of its fellows, responded to the stroke of an instrument in the manner described, &c. The tooth was extracted, and in six months the health of the patient was perfectly restored. At the time of the extraction there was no gush of pus following the fang, but in passing a probe into the alveolus afterwards a yielding body was found obstructing the aperture, which was easily cleared by thrusting the probe onwards. Profuse purulent discharge followed the withdrawal of the probe.

CASE XXXIV.

Scrofulous Abscess in both Orbits and the Right Antrum, terminating in Meningitis and Death, under the Author's care, in conjunction with Mr. E. C. Hulme (from the Author's Treatise "On Abscess and Tumours of the Orbit," Part ii, Case I. in Appendix).

W. Burbidge, aged ten years, first came under my notice in the latter part of the year 1866. He was a patient of my late colleague, Mr. Hulme, under whose care he had been for some years. The disease was attributed by his mother to a blow received three years before: but it is quite evident, from the scars about the face and elsewhere, that he is a very scrofulous boy, and that in all probability the disease in the orbit was of a scrofulous nature. The right eyeball is seen to be enormously protruded, the lids turned inside out, and there are sinuses at various points round the margin of the orbit, from which a thin discharge constantly escapes.

When I first saw him, he suffered occasionally from pain of a severe kind, and had intermittent attacks of inflammation in the protruded parts, but no head symptoms had yet shown themselves.

About the end of March, 1867, there was occasional delirium and screaming, and in May the left eye began to protrude, and very soon this eye was entirely destroyed. The right eye, though first affected, retained some little vision within a very short time of the patient's death, which occurred on August 5, 1869, the latter few weeks being passed in a state of semi-coma. I assisted Mr. Hulme in a post-mortem examination of the head, when we found there was a quantity of thick curdy yellow tubercle, or inspissated pus, lying between the dura mater and the sphenoid bone of the right side, and extending up to the squamous portion of the temporal bone on the same side across the sella turcica and into both orbits.

There was caries of the floor of the right orbit and an opening into the right antrum, which itself communicated with the mouth by another opening in the alveolar ridge. The antrum, therefore, on this side formed an abscess full of fœtid pus.

The membranes of the anterior and middle lobes of the brain showed slight traces of recent inflammation.

The state of the antrum and floor of the orbit was probably a late complication of the primary disease, and it was, of course, impossible to have guessed at the amount of mischief that was going on within the cranium until a very late period in the case.

The thick deposit of new bone seen upon the bones of the base of the skull shows clearly that inflammatory thickening had been going on in this region for a considerable time; but it by no means follows that this

morbid process could have been stopped or averted by any surgical interference.

CASE XXXV.

M. Dubois' Case of Simple Accumulation of Mucus in the Antrum, simulating Tumour of the Upper Jaw. (Mackenzie on "Diseases of the Eye," p. 69.)

The patient, when a boy of seven years of age, was observed by his parents to have a hard round tumour, about the size of a filbert, near the root of the nasal process of the left upper maxillary bone. It gave no pain and did not appear to be increasing. A blow, however, which he received about a year after by a fall, excited this tumour to grow, which it did by almost insensible degrees till he was fifteen. It then began to enlarge more evidently, and to cause slight pain. By the time he was eighteen it was so considerable in size as to raise the floor of the orbit, so that the eye was pressed upwards and appeared less than the other, on account of the limited motion of the lids. The palate was depressed so that it formed a swelling of about the size of an egg divided longitudinally; the nostril was almost completely closed, and the nose was twisted to the right. The cheek was prominent; and the skin below the lower eyelid, and covering the upper part of the tumour, was of a livid colour and seemed ready to give way. The upper lid was pushed upwards, and the whole length of the gums on the left side had advanced beyond the level of those of the right. Breathing, speech, mastication, and sleep were impeded.

Sabatier, Pelletan, and Boyer being called in to consultation, the *unanimous opinion* appears to have been that this was a case of *fungus* of the *maxillary sinus* requiring an operation. So much thinned was the bone behind the upper lip, that Dubois felt there a degree of fluctuation, and proceeded to open the sinus at that place, expecting merely to give issue to a small quantity of ichorous fluid, and then to encounter the fungous tumour. The opening, however, allowed a very considerable quantity of a ropy substance to escape, similar to what is found in ranula. The probe being passed into the opening, entered evidently a large cavity quite free of any kind of fungous or polypous growth. It is probable that the opening made at this first operation, if kept from closing, would have served for the complete cure of the disease; but Dubois seems to have thought differently, and proceeded five days afterwards to extract three teeth and to remove the corresponding portion of the alveolar process. This enabled him, on placing the patient in a favourable light, to see the whole interior of the dilated sinus, at the upper part of which, and near to the edge of the orbit, he discovered a canine tooth, which he extracted. After this the cavity gradually shrunk;

the tumour of the cheek that of the palate, and the displacement of the nose, continued for some time, but after seventeen months no deformity existed.

CASE XXXVI.

Mr. Henry Smith's Case of Abscess of the Antrum, simulating Malignan Tumour of the Upper Jaw.

A middle-aged woman was admitted under Mr. Smith's care with a large swelling in the right cheek, which was pronounced, after examination by Sir W. Fergusson and Mr. Smith, to be probably due to the development of a malignant tumour in the antrum Highmori. There being no enlargement of the glands under the jaw, the case was thought to be a favourable one for excision of the upper jaw. Fortunately, however, while the patient was in the hospital she had an attack of erysipelas of the face, which lasted between two and three weeks; and, at the end of this time, the swelling in the cheek, which had increased considerably, diminished suddenly on the bursting of an abscess beneath the under eyelid. This materially altered the view taken of the case, and then all idea of removing the upper jaw was abandoned. As the swelling in the cheek, however, did not disappear entirely, after another three weeks had elapsed, Mr. Smith performed the usual operation for evacuating any fluid matter pent up within the antrum. The second molar tooth, the fangs of which correspond to the floor of the cavity, was extracted, and a large triangular trocar was pushed up its socket. No pus came away, however; and, after nipping away a portion of the alveolar ridge, so as to be able to pass a finger into the antrum, the cause of the michief was found to be necrosis of a portion of the bony wall of the antrum, which part was consequently removed. This case is of considerable interest, as showing the difficulty of making a sure diagnosis between disease calling for removal of the upper jaw and disease limited to a portion of the maxilla only. It teaches this lesson, that in all instances in which the least doubt exists as to the nature of the affection, a preparatory puncture should be made into the antrum by means of a perforator, either pushed through the socket of the second molar tooth after its extraction, as was done by Mr. Smith, or through the canine fossa under the cheek.—(*Brit. Med. Journal*, March 2, 1867.)

CASE XXXVII.

Abstract of a Case of Acute Abscess of the Antrum and Orbit, terminating fatally.—(Cited by M. Demarquay, from Fischer, "Klinischer Unterricht in der Augenheilkunde," p. 9. Prague, 1832.)

(Case 6.—Demarquay, op. cit., p. 145.)—A shoemaker, twenty-seven years of age, of an irritable temperament, and addicted to drinking, had

one of the left upper molar teeth extracted. This operation was followed by swelling and redness of the side of the face; epiphora; rigors; photophobia, and intolerable pain in the side of the head, increased and rapid swelling of the face and eyelids.

Some days after, distinct fluctuation at the internal angle of the eye. Abscess opened; yellowish-green and fœtid pus escaped.

The symptoms now became aggravated, and he died in convulsions within less than a month from the commencement of the case.

Post Mortem Appearances.—Dura mater and pia mater congested and altered in colour. Anterior lobe of the brain contained a large collection of pus communicating with the lateral ventricle. Optic thalamus soft and pulpy. Substance of the brain unusually soft. Pus covering the pons Varolii, and filling up the fourth ventricle.

The roof of the orbit softened and perforated, the opening communicating with the abscess in the brain. The floor of the orbit perforated, the opening communicating with the antrum of Highmore, which was full of pus.

CASES XXXVIII, XXXIX.

Two Cases (reported by M. le Baron Phillipe Boyer) of Abscess of the Antrum. (Boyer's "Maladies Chirurgicales." Tome v, p. 115. Footnote.)

In the month of September of the year 1839, two men came on the same day to the Hospital St. Louis, each having an abscess of the right antrum. I proposed to them that they should come into the hospital to submit to an operation suitable for curing them. One of them accepted; the other refused, saying that he must return to the country. I operated on the one who came into the hospital, following the rules laid down by Boyer, and six weeks after he went out cured, with a persistent opening in the alveolar border; the tumefaction of the cheek had partly disappeared. The second patient came back in April of the year 1841. He had returned to Longroy, in the Department of the Moselle, where he lived; this man, thirty-eight years of age, is the conductor of *Voitures de Marchandises.* Since the day he first came to the hospital, that is to say, for eighteen months, he had done nothing to his tumour. Eight months ago an opening formed spontaneously in the middle of the right cheek, when pus was discharged. Some days after this opening closed, and the swelling of the cheek was lessened. Every six weeks the cicatrix reopened and gave issue to pus, closed up again, and again broke open. The interior of the mouth had the same swelling as at first, this corresponding to the whole maxillary portion of the palatine arch. The alveolar border, from which the teeth had been extracted with a view to causing a dispersion of the tumour, is much larger than in the normal condition, and is perforated by

two very small fistulous openings, only discernible from the pus that exudes from them. Behind the alveolar border is a third fistula. The gums are swollen and bleeding. Again proposed an operation. He accepts and comes into the Hospital St. Louis on April 8th, 1841. On the 9th, I purged him, and on the 10th I operated. I follow the rules laid down by my father ; I elevate a quadrilateral piece of the gum, and perforate the alveolar wall of the antrum with the aid of a triangular trephine. The swelling of this wall, somewhat exostosed, renders this perforation difficult ; and in order to facilitate it, I am forced to direct the perforator downwards towards the swelling in the palate. My instrument then penetrated into the antrum ; but at the same time it fractured the maxillary portion of the palate, and there was a flow of blood from the nostril, probably due to the rupture of the arch of the palate, and a perforation of the mucous membrane of the nose. The little finger could pass through the aperture made into the antrum, after I had removed the instrument and three pieces of bone resulting from the fracture of the alveolar border. No perceptible pus escaped, as had occurred in the case of the first patient. The reason of this phenomenon is plain ; the pus had been evacuated by the different fistulous openings previous to and during the operation. The aperture being large, and there being a troublesome flow of blood, I thought it better not to plug the wound to keep it open, and to stop the flow, but directed the *interne* pupil how to act in case the wound bled. On the 11th of April there was no external swelling, but swelling of the lips of the wound in the gums. The orifice in the antrum being somewhat closed, I introduced a pledget of charpie ; on the 12th and 13th the same dressing. On the 14th I removed the plug. A fresh piece of necrosed bone is pulled out. On April 17th, the patient, seeing that the results of the operation are successful, leaves the hospital to return to the country. He is instructed how to inject the antrum. The fistula on the cheek was cicatrized, and everything combined to make me believe that it would not re-open. In fact, in an analogous case that I had observed in the practice of my father, in a woman of 26 years of age, I had seen the fistula in the cheek, which discharged before the operation, ceased discharging pus afterwards, and become firmly and permanently cicatrized.

CASE XL.

Dr. Chase's Case of Cystic Growth in the Antrum, attached to the fang of a tooth. (From the "Dental Cosmos," cited in Dr. Garretson's work on "Diseases and Surgery of the Mouth and Jaws," p. 350. Philadelphia, 1869.)

An Irishwoman, aged forty years, came to have the right first upper molar extracted. I found her teeth in a bad condition generally : they

were decayed and loose, and the gums congested. This particular tooth was decayed and very loose. On pressing it, the alveolus seemed to move with the tooth. Adjoining it, in front, was the root of the second bicuspid, the crown gone. As she was of that class who make no attempt to preserve their teeth, I extracted the molar without hesitation. She had told me that her "jaw" had ached for three or four months previous to this time. On applying the forceps the beaks readily passed under the gums without lancing, and the tooth, much to my surprise, came away with a very slight application of force. But this surprise was not equal to my astonishment, when I saw what I had brought away with the tooth, namely, a large quantity of alveolar substance, the bicuspid root, and a fibrous connective tissue tumour, nearly an inch in diameter, attached to the tooth, and inclosing two of the roots, namely, the posterior buccal and the palatine roots. After being in alcohol three days the tumour was nearly white, and had shrunken to one-third of its original size. On cutting it open it was found filled with a solid structure. The consistence was that of tubercle, or pressed cheese-curd; the colour light yellow, tinged in most parts with red. The roots within the tumour were nearly free and covered with thin periosteum, which had thickened into a loose spongy mass, extending even to the base of the body of the tooth. The appearance was like that of roots involved in alveloar abscess. The walls of the tumour were not composed of detached dental periosteum. There were, apparently, two coats, the outer fibrous, like periosteum; the inner a mucous one, like the lining of the nasal cavity.

CASE XLI.

Sir John Fife's Case of Dentigerous Cyst of the Antrum at Newcastle Infirmary. ("*Lancet*," 1850, vol. ii, p. 343.)

W. B., aged twelve years, a native of Heworth, was admitted on August 16th, with great enlargement of the left cheek, from enormous dilatation of the antrum. The patient had measles three years ago, since which time the present tumour has gradually increased; its distension seems, from the feeling, to be caused by fluid.

Sir John Fife made an incision from the commissure of the mouth, horizontally backwards; another commencing at the same point, directly upwards. He then dissected back the flaps as far as the orbit, first tying the facial artery, then with Hey's saw he cut out a right-angled triangle of bone, exposing the whole of the antrum, which contained two teeth and about four ounces of gelatinous, amber-coloured fluid, but no organic disease. The swelling is now considerably decreased and the patient is doing well.

CASE XLII.

M. Gensoul's Case of Varicose Tumour of the Antrum. Operation by M. Renaud.—Recurrence of the disease.—Removal of the Upper Jaw by M. Gensoul.—Complete cure.—No return of tumour five years after the operation.

(Mademoiselle Monique Tournier, thirty-five years of age, living at Moirans (Department of Isere, perceived in the year 1820 that a tumour was elevating the right cheek bone, without causing the slightest pain and without any assignable cause. She had enjoyed good health from her birth : her constitution was strong, her temperament sanguine, so that she at first troubled herself very little about this tumour, which acquired the size of a walnut and then remained almost stationary until the year 1823, when the gums of the right side of the upper jaw became swollen and seemed to soften to the extent of simulating the presence of pus. A physician whom she consulted, misled by this appearance, incised them : they gave out nothing but blood, and the tumour continued to increase, so as to become double its original size in a year.

Mlle. Tournier then called in M. Renaud, a skilful surgeon of Grenoble, who tried to remove the tumour by opening widely the softened jaw above the roots of the teeth, and tearing away the tumour from the interior of the maxillary sinus, where it had originally commenced. Subsequently to that operation two fistulous openings formed, which only closed six months afterwards. But the patient did not fail to perceive that the operation had been insufficient. The tumour took on a more rapid growth, and it had acquired a considerable bulk when she presented herself at the Hôtel Dieu, on January 6th, 1828. The right cheek was then much elevated, the right nasal fossa completely obstructed, the palate pressed down into the mouth, the teeth buried in the tumour, and only their lower surfaces could be distinguished. The enormous enlargement of the maxilla and its displacement towards the mouth and nose caused an obstacle to the articulation of sounds and to deglutition. If pressure was made somewhat firmly upon the affected cheek a noise was heard, a kind of crepitation, as if parchment was being rubbed between the fingers, and one could feel distinctly that the attenuated bony palate yielded and returned on itself.

I persuaded the patient to submit to an operation which would rid her for ever of the tumour, and which could alone arrest the course of a malady of such gravity. She consented. I prepared her during some days by a mild regimen, &c., and on January 21st proceeded to the removal of the maxilla of the right side. I commenced by making three incisions in the cheek, similar to those in the case of Véricel, only that the fourth incision, which descended by the side of the masseter, seemed to me

useless. These flaps being raised and held back, I cut the bones with the aid of a chisel and mallet; but in this operation I only took away a small portion of the malar. I then proceeded to displace the tumour, it yielded with marvellous facility; I detached it from the roof of the palate by the aid of a bistoury. This operation was quickly over (two minutes and a half), which was due to the slight consistence of the bones that I had to divide. The patient was placed on her bed, and I allowed the flaps to remain raised, and not united for about one hour after, in order that time might be given for the re-establishment of the general circulation in its normal rhythm, and for the arteries to furnish blood; but, as in the preceding case, there was only a slight bleeding.

The bottom of the cavity, which we had leisure to observe in that interval, afforded us a view of the posterior nares, represented by the pterygoid plate on one side and the vomer on the other. There remained besides a small portion of the maxillary bone, near the fundus of the orbit, but as it was quite healthy I did not attempt to remove it. * * * The patient made a good recovery.

The tumour, examined after its removal, had a spherical shape. In order to judge of the nature of the disease, we had to open from behind the antrum, which I had removed entire and preserved intact. I raised a bony plate of the size of a five franc piece, and I could then perceive a soft vascular tumour, having the aspect of an erectile fungus. I had the vessels, which were very apparent, injected with mercury, and this metal, which instantaneously circulated throughout all parts of the tumour, left no doubt as to its nature. I should add, that when I opened the antrum the tumour allowed the blood it contained to run out, shrunk on itself, and remained attached to the osseous walls only by cellulo-vascular prolongations.

CASE XLIII.

Mr Christopher Heath's Case of Fibroid Villous Growth in the Antrum.
(*See Mr. C. Heath's Essay "On the Jaws," &c.*, p. 212.)

In September, 1866, Dr. Whitmarsh, of Hounslow, brought to me a gentleman who two years before had perceived some growths in the right nostril, which gave no pain but kept up a constant discharge, especially at night. In the early part of the year they had been removed in part by a surgeon, and since that the growth had much increased. There was a fungous growth in the right nostril, and the whole right maxilla was swollen, and discharged their pus at one or two points near the eye. All the teeth on the right side are gone. There is a fungous looking growth in the molar region, and a probe passed up easily by its side into the antrum. I removed the disease on September 23rd, clearing away the whole of the growth, which was very friable, and leaving the posterior

wall of the antrum and the infra-orbital plate untouched. In the course of the operation I found a distinct polypoid growth filling the posterior nares, which I removed. The patient rallied well from the operation, but unfortunately got congestion of the lungs and died on the fifth day.

CASE XLIV.

Hyperostosis of the Bones of the Face. (*Jlg and Wenzel Gruber's Case. Translated from Virchow, op. cit.*, vol. ii, p. 24.)

A girl, previously healthy, became amaurotic at the age of ten years, and had an attack of epilepsy, followed, during whole months, by a violent headache, accompanied with delirium. As soon as this ceased, the convulsive attacks became more frequent, and at the end of each of these an attack of erysipelas came on which invaded the whole head, and lasted, with the desquamation, from eight to ten days. At the age of 16 years the hearing was lost, the head enlarged; there were violent pains, heaviness of the head, feebleness and loss of smell, &c.; the poor patient died at last, at the age of 17 years, immediately after a fresh attack of erysipelas.

CASE XLV.

M. Forcade's Case of Hyperostosis of the Bones of the Face. (*Translated from Virchow, "Die Krankhaften Geschwülste,"* Band ii, p. 22.)

M. Forcade (de Perpignan), a surgeon, had a son, who, with the exception of an attack of smallpox, had enjoyed good health up to the age of twelve years (1734). At that time his father opened for him, *at the inner angle of the right eye, a lachrymal tumour*, which suppurated for a very long time. At the same time a tumour of the size of an almond was developed on the nasal process of the superior maxilla of the right side, and increased to such an extent that at 15 years of age it compressed the cartilages of the nose so that the young man could only breathe through his mouth. The disease extended thence to the lower jaw, which only retained its form at its articular extremities and its alveolar borders; the upper jaw, the walls of the orbit, with exception of the roof, the nasal apertures, the palatine bones, the malar bones, were attacked by the mischief and were swollen into shapeless masses. At 20 years of age his face was monstrous. There was exophthalmia with myopia, difficulty of speaking, and general debility. The patient died, blind and phthisical, at the age of 45 years. The head, when macerated, weighed 8¼ lbs., the lower jaw 3 lbs. 3 oz. The large exostoses, tuberculated and lobulated, having the density of marble, projected around the lower jaw and from the lower margins of the orbitar cavities.

The bones of the cranium were thickened, studded with small, flat excrescences and entirely sclerosed. The frontal and maxillary sinuses had entirely disappeared. The remainder of the skeleton was remarkable for the fragility of the bones.

Lastly, it was noticed at the autopsy that the muscles of the face could be scarcely distinguished ; they had assumed a fibrous aspect, and were confounded with the cellular tissue and the periosteum.

CASE XLVI.

Mr. Prescott Hewett's Case of Fibrous Tumour attached to the body of the Sphenoid, but simulating a tumour of the Upper Jaw. ("*Medico-Chirurgical Transactions*," vol. xxxiv, p. 43.)

A man, twenty-five years of age, was admitted into St. George's Hospital, under the case of Mr. Prescott Hewett, "with a large tumour of an irregular shape, occupying various regions of the left side of the face." In the cheek it formed a swelling of the size of a turkey's egg, and filled up the greater part of the superior maxillary region ; the outline of the bone was perceptible to the touch in a few places only ; the zygomatic arch was much more prominent and more curved than natural, having been pushed forwards by the tumour, portions of which could be felt under the temporal muscle. The diseased structure could also be felt as small flattened bodies at the lower part of the orbit, lying immediately under the conjunctiva, and apparently quite moveable ; the bones of the inner and outer walls of this cavity as well as those forming its circumference, were not affected or displaced ; but it was impossible to make out exactly the state of the bones at the lower wall, owing to the tumours which were there ; the eyeball was not more prominent than natural. Portions of the morbid growth were detected in the left nasal fossa, from whence a small round mass projected slightly at times into the pharynx. The tumour overlapped the front part of the alveolar process and projected beneath the lip. About six years previous, the patient had observed *what was supposed to be a polypus of the nose, which was easily removed ;* but some little time after, the cheek began to swell, and gradually the tumour commenced to show itself in the various other positions described. Its growth was painless throughout. A year previous, caustic had been freely applied with the idea of destroying it ; and two large cicatrices marked the places of its action. At various times there had been *extensive bleeding from the nose ;* these bleedings had somewhat reduced the patient, who was of a spare habit and pale ; this paleness being attributed to a loss of blood, which occurred shortly before his admission. It was decided to remove the tumour by the usual incisions for the removal of the upper jaw. The bones having been divided with cutting

forceps, the superior maxillary and malar were easily tilted out of their place; when it was found that the disease was not connected with the upper jaw, but was behind it. The greater portion, which was in view, was removed: some portions were lying in contact with the pterygoid process, some portions imbedded under the temporal muscle; other portions in the orbit. Before the operation could be completed, the patient became so faint, that it was found impossible to proceed with the operation, and he subsequently sank. The preparation of the parts shows the superior maxillary and malar bones, and portions of the tumours extracted from behind them; the bones are healthy, but altered in shape from pressure; the tumours present all the characteristics of fibrous structure. The parts removed after death show a morbid growth, originating in the root of the left nostril, and especially on the inner edge of the pterygoid process and under surface of the body of the sphenoid bone, to which parts small portions of the tumour were found still attached. The sphenoidal sinuses were filled with diseased structure of a similar character, and were very much dilated; so much so, that at one point the bone had altogether disappeared, and left a small hole, where the tumour was lying in contact with the dura mater.

A small portion of the growth was also found at the upper and back part of the septum nasi, which was forced over to the right side and partially destroyed by absorption; here the mucous membrane was somewhat thickened; and there was a small pendulous body loosely connected with the velum palati, and hanging by one side of the uvula. Small flattened growths of a similar nature and of a bulbous shape were found deeply imbedded in the spheno-maxillary and temporal fossæ, as well as at the back part of the orbit; none of them had any attachment to the bone, they were all connected to each other, and to the growths in the nostril, by a slender pedicle, which passed in the direction of the spheno-palatine foramen; the growth in the orbit had reached that situation by creeping through the spheno-maxillary fissure. The bones of the orbit were quite healthy. The preparation is in the Museum of St. George's Hospital (series xvii, 36 and 37 in the Catalogue).

CASE XLVII.

Case of Fungoid Tumour of the Antrum, under the care of the Author.

J. R., aged sixty-one years, was first placed under my care by my colleague, Mr. Taylor, in July, 1866. The appearance of the patient at that time is represented by the accompanying woodcut. (See fig. 34, p. 415.)

In the autumn of 1865 he had severe and troublesome bleeding from the nostrils, for which plugging was resorted to. This recurred several

times and was not at that time associated with any swelling of the nose or cheek, nor was his general health at all impaired then or previously. In the early part of 1866, however, he noticed a swelling at the inner canthus of the left eye, and an obstruction of the left nostril. The eye began to protrude and a tumour was felt in the orbit below the eyeball.

In August, 1866, the whole of the left cheek was enormously swollen, the nose thrust over to the right side, the left nostril completely occluded by a polypoid growth, and the left eye protruded an inch in front of its proper level.

About the end of September the upper part of the cheek became discoloured, reddened, tense and shining, and in a short time ulcers formed, from which a thin puriform discharge escaped, and later on (in November) some bleeding occurred.



Fig. 34.

Another surgeon under whose care he came at about this time, injected the tumour within the cheek with acetic acid solution in the manner recommended by Dr. Broadbent. This operation was repeated at intervals of a few weeks and had the effect of setting up softening and suppuration of the tumour, a copious and most offensive pus escaping through the socket of one of the teeth of the upper jaw, and also from the sinus between the gum and cheek.

This patient died exhausted in March, 1867, and unfortunately no post-mortem examination could be obtained.

CASE XLVIII.

Mr. G. Lawson's Case of Epitheliomatous Tumour of the Upper Jaw, occupying the Antrum, treated by Excision of the Disease and the Application of Escharotics. ("*Transactions Clinical Society of London*," vol. vi, p. 20.)

Henry B., aged sixty-five years, was admitted into Middlesex Hospital on March 18, 1872, suffering from a tumour of the left upper maxilla. He had always been a healthy man, and no member of his family had ever suffered from cancer.

History.—About two months previous to his admission, in January of the present year, he began to suffer from severe toothache in the left upper jaw, for the relief of which he had at short intervals four partially decayed teeth removed, but without gaining any relief. Shortly after this a swelling appeared in the mouth, above the alveolus, corresponding with the site from which the teeth had been extracted. The pain became steadily more severe, and a few weeks later the face over the left upper maxilla gradually increased in size. He now applied to Middlesex Hospital, and was admitted as an in-patient.

State on admission.—There was a soft elastic tumour over the superior maxilla of the left side, about the size of a small egg, and evidently growing from within the antrum. The bone over it had been partially absorbed, and the tumour was pressing upon the skin, which in places was adherent to it. He could blow clearly through the left nostril, showing that the cavity of the nose was not encroached upon by the growth. There was no displacement of the eye. On looking into the mouth, there was a small soft tumour bulging above the alveolus about the size of half a walnut.

An exploratory incision was made into the soft mass protruding into the mouth, when some pus, mixed with blood and soft grumous material, escaped. The finger, passed through the opening, came upon a soft tumour occupying the whole interior of the antrum. At first the patient seemed to have received relief from the exploratory incision, but this was clearly due to the escape of the pus, and from more space being afforded for the tumour to grow without pressing so firmly on the adjacent parts; but in about a week the pain returned with the same severity, and the skin of the face over the tumour inflamed and ulcerated, and through the opening a fungoid mass protruded. I now determined to excise the growth, with all the integument that was included in the disease, and to apply freely the actual cautery, and afterwards the chloride of zinc paste spread on small pieces of lint. This I accordingly did, and in a few days afterwards large sloughs came away. Over the greater part of the space thus heated healthy granulations soon sprung up, and portions of bone destroyed by

the escharotics gradually became detached and were removed. Twice during the progress towards convalescence the growth began to recur, and on each occasion the patient was put under chloroform, and the hot iron, and afterwards the chloride of zinc paste, were applied to the suspicious looking re-growth. On July 5 he was discharged from the hospital, all trace of the disease having been apparently eradicated. Since that date the man has gained strength, and there has been no recurrence of the disease. (Nov. 8, 1872.) I would add, that after the smart of the first operation had subsided the patient was freed from all pain.

Cases of Ozæna.

CASE XLIX.

Dr. Rouge's Case of Ozæna treated by Operation—Meningitis—Death.

Mdlle. W——, twenty-eight years of age (having undergone a previous operation with only partial success in October), was again operated on on the 11th of December. It was performed for the purpose of removing a necrosed and carious piece of the ethmoid, which had not been perceived in the previous operation. To this was due the persistence of some amount of odour. The ozæna was so far removed that the patient requested, with some urgency, to be relieved entirely by a new operation. The probe reached the ethmoid, which gave a dry bruit. On the 11th December, chloroform. The bistoury follows the cicatrix in the upper gingivo-labial furrow. I detach the nose according to my method, cutting the attachment of the nostrils on both sides; with the gouge I take away the whole of the perpendicular plate of the ethmoid, so that the finger passes directly to the under surface of the horizontal plate of that bone. This done, I feel on the right side, high up, an ulceration of the os planum, which I gouge over an area of about 1 centimetre; the finger introduced through this aperture passes into the cavity of the orbit behind the eyeball. The nasal fossæ are washed out with a full stream of water to remove blood and clots. The ulcers are touched with nitrate of silver; the nose and lip are now replaced. In the evening, tumefaction of the eyelids on the right side, temperature 37·2° (Reaumur). On the 12th temperature 37°; ecchymosis of the eyelids, which are so swollen as to hide the eyeball; no pain; the general condition excellent. In the evening, temperature 38·4°. On the 13th, in the evening, the patient complained of headache, and was restless in the night. On the 14th, great excitement, incoherence of ideas, complains of the head and of a pain between the shoulders. Ice to the head; blister to the nape of the neck; calomel, 5 centigrammes every hour. In

the evening, temperature 38·2°; the restlessness continues during the night. On the 15th, unconscious; 16th, coma; 17th, death, with a temperature of 41°.

The autopsy disclosed an obstruction of the ophthalmic vein by a clot containing globules of pus, and general suppurative meningitis, all the veins being very much dilated and as if varicose and gorged with blood. There was no fissure of the ethmoid, the lamina cribrosa was intact; no purulent focus in its neighbourhood; the bone was healthy around the limits of the operation, which had been performed on the vertical plate and the os planum.

CASE L.—Syphilitic Ozæna.

Case of Necrosis with fatal termination. Trousseau ("New Sydenham Society's Translation," p. 66), Lecture on Ozæna.

A young English officer had been suffering for a long time from syphilitic ozæna. He had had, on the previous evening, a sudden and terrible suffocative attack, caused by the presence in the posterior nares of a foreign body which had subsequently fallen into his throat. In the midst of his suffocative convulsions he seized with his fingers, and finally drew forth, a large, irregularly-shaped, and rough-edged piece—about a fourth part—of the ethmoid bone. On the same day cerebral symptoms set in, under which he died within 24 hours. It is probable that there was suppuration of the meninges of the brain at the points corresponding to the cribriform plate of the ethmoid bone.

Cases in Illustration of Intracranial Disease in connection with Affections of the Nose.

CASE LI.

Dr. Hughlings Jackson's Case of Epistaxis preceding Retinal Apoplexy.

"A man, forty-nine years of age, had, two years ago, bleeding from the nose to the extent of 'a basinful and a half.' Five months before I saw him he had hemiplegia of the right side and loss of speech. He came to me for the two latter symptoms, having, however, nearly recovered from them. He had, then and since, albuminous urine, and subsequently hæmorrhage in the retina of the left eye. For the defect of sight he afterwards consulted Mr. Hulke, but soon returned for a slight attack of hemiplegia of the right side, which is rapidly passing off." ("Clinical Lectures and

Reports, by the Medical and Surgical Staff of the London Hospital," vol. iii, p. 251).

CASE LII.

Dr. Hughlings Jackson's Case of Subjective Sensations of Smell associated with occasional Loss of Consciousness (*Medical Times and Gazette, February 29th*, 1868).

A man æt. thirty-eight years, admitted (into the London Hospital) on February 10th, had had two severe fits, the first in July, 1867. For six months previous he had been subject to occasional sensations of a "queer" smell. The first severe seizure happened in bed, and appears to have been a convulsion. Then, after coming round, he had the same day many slight seizures. Whilst sitting, he would say, "What a curious smell!" and then go off quite unconscious; his lips turned blue, and next quite white. He has since been subject to these slight seizures—sometimes one a-day, two a-day, or one a-week—and in September had a second severe fit. It seems clear that in the two severe seizures only has there been any obvious convulsion. If the slight attack takes him when out walking he does not fall, although he becomes insensible. "He looks about wild;" when he comes round he does not know his wife or children, nor where he is. He says that sometimes these slight attacks do not last more than half a minute, his wife says never more than five minutes. It appears that the sensation begins suddenly, and is not present in the intervals of the seizures. He can still smell peppermint. In most cases where there is this subjective sensation power of smell is lost. His memory has failed very much lately, and of this he and his wife complain greatly. If anyone pays him money he does not remember it, and it is necessary to send some one with him when he goes to business to look after his purchases. In spite of this he seems intelligent, and differs in his talk, appearance, and manner from epileptics, who seem more mentally impaired, although they complain less of mental defect.

CASE LIII.

Dr. Hughlings Jackson's Case of Anosmia associated with Intracranial Disease and Amaurosis (*Medical Times and Gazette, October 11th*, 1874).

A boy, then ten years of age, was sent to the hospital for the epileptic and paralysed, April 1st, 1863. He had been under Mr. Couper's care at Moorfields Ophthalmic Hospital for blindness from atrophy of the optic nerves, and was sent to me on the supervention of what I may call medical symptoms.

Eleven weeks before I saw him he had a "bilious attack." He was only sick one day. He strained a good deal, and brought up "yellow"

thick stuff. There was severe pain in the forehead and back of the head, and this continued. His eyes began to blink because light was painful. In about five weeks he was quite blind.

When I saw him he looked quite well, except for the vacancy of blindness. He had, however, besides the absolute blindness from atrophy of the optic nerves, *complete loss of smell*, and was subject to "fits" of a kind worthy of attention when considered with the subsequent loss of use of his legs. He "came over with faintness" and "fell down from the knees." There was no convulsion. It was reported in the first account of these seizures that he lost the use of his left side. In the intervals of the attacks he had weakness of the legs. When I saw him, however, he could walk quite well and could stand on one leg; but his mother reported that he had great difficulty in getting along when he had walked some distance. He continued subject to the attacks mentioned. He would fall off his chair when sitting, dropping on his knees; but after a quarter of an hour he would pull himself up by the table. He was not insensible. On May 5th he was reported to have the "dropsy." I therefore went to see him, and found that he had no œdema anywhere, but that he was much fatter. There was no albuminaria. I, for the first time, noticed that his head was large, and especially that it was broad; it was larger than it had been, and his mother said that the neighbours noticed that it was getting bigger. He was in good general health, and seemed intelligent. He could raise himself up in bed. There was return of pain in the head. . . . .

Condition eleven years later.—He now sits up, but cannot stand alone, the muscles of the legs seem well developed; the right foot is in the position of varus, and had been so for several years; for how many, I could not learn. The left foot is in a different condition—that of valgus; the sole is flat, and the foot turns out slightly, the inner malleolus being prominent as the right outer malleolus is. There is also lateral curvature of the spine in the lower dorsal and in the lumbar regions, the convexity being to the right. His legs are well nourished; he has great power in them—more in the left—and can stamp vigorously. He usually sits up in his chair, and he showed me that he can go out into the back yard without help. He catches hold of an iron support near him, swings himself up, then takes hold of the door, and so on from object to object. He gets along pretty briskly in this fashion.

CASE LIV.

Nasal Polypus removed with Tincture Ferri Chloridi.

G. Troupe Maxwell, M.D., Fernandina, Florida (St. Louis *Medical Reporter*), reports a case of a very large nasal polypus, which was attached by a pedicle to the inferior spongy bone of the left nostril.

Professor Paul F. Eve had extracted several nasal polypi from this same lady during previous years. An examination revealed a large, pear-shaped, wrinkled tumour behind the uvula, hanging in the throat.

Reducing the officinal tincture mur. ferri one-half, by the addition of water, with an ordinary glass penis syringe, about ʒij were injected into the nostril, holding her face up, so as to prevent the fluid from escaping too quickly from the external opening.

The application caused very little pain or irritation in the nasal cavity. She was put in a darkened room, where she lay upon a bed and slept an hour or two. Upon awaking she expressed great relief from all her sufferings. The tumour had shrivelled decidedly. The husband was directed—as she lived quite a long distance off—to repeat the operation twice daily until the mass sloughed off, and then reduce the tincture to one-fourth or less.

In a few days he received a message that "the whole thing, roots and all, had come away."

Her relief was complete, health improving and spirits fine. The growths will not be permitted to return, for an occasional application of the tincture will destroy any recurrent polypus.

CASE LV.

Dr. Alibert's Case of Apoplexy following a violent fit of sneezing.

A military man, aged about forty years, excessively stout, gave himself up to drinking, and took no solid nourishment. He was the subject of such violent sneezing, that his face became of a deep purple colour, and his respiration difficult and laborious. One day after twelve or fifteen minutes he was asphyxiated. ("Nouveaux Elémens de Thérap. et de Matière Médic." 4th edit. Paris, 1817, tom. i, p. 136.)

CASE LVI.

Sir William Lawrence's Case of Myeloid Tumour involving the Antrum (reported by Sir James Paget in his work on "Surgical Pathology," vol. ii, p. 219.)

A woman, twenty-two years old, was under Mr. Lawrence's care, in March, 1851, from the alveolar part of whose right jaw growths, which were regarded as examples of epulis, had been four times removed in the previous thirteen months. In the fourth operation, in August, 1850, the growth was found to extend through the socket of the first molar tooth into the antrum, or into a cavity in the jaw. It was wholly removed (as it was

thought), and the wounds healed soundly, but nine weeks afterwards a fresh growth appeared, that seemed to involve or arise from nearly the whole front surface of the right upper jaw-bone ; it was firm, tense and elastic, but not painful, projecting far on the face, as well as into the nostril and into the cavity of the mouth at both the gum and the hard palate. This swelling, under various treatment, rapidly increased ; and in December, 1850, a similar swelling appeared at the left canine fossa, and grew at the same rate with that of earlier origin. Of course the co-existence of two such swellings led to the fear, and in some minds to the conviction, that the disease was cancerous ; and the more, because, at nearly the same time with the second of these, two soft tumours had appeared on the parietal bones. Still the patient's general health was but little impaired; and when the mucous membrane of the palate ulcerated over the most prominent parts of the tumours, neither of them protruded, or bled, or grew rapidly. In April, 1851, the growth of the tumours appeared to be very much retarded, and for the next month was hardly perceptible ; and the patient being very urgent that something should be done to diminish the horrible deformity of her face, Mr. Lawrence, in May, cut away the greater part of the front and of the palatine and lower nasal parts of the right upper jaw, and removed from the antrum all that appeared morbid, including, doubtless, nearly every portion of the tumour.

The excised portion of the jaw-bone was involved and imbedded in a large, irregularly spherical tumour, composed of a close-textured, shining, soft and brittle substance, of dark greyish hue, suffused and blotched with various shades of pink and deep crimson. It was not lobed, but included portions of cancellous bone, apparently new formed, and was very closely adherent to all the surrounding parts. To the microscope it exhibited all the characters of myeloid disease, the many nucleated corpuscles being remarkable, well defined, and full. They composed nine-tenths of the mass, and were arranged like clustered cells. The patient recovered perfectly from the effects of the operation, and to everyone's surprise, the tumour on the left upper jaw, which had been in all respects like that removed from the right side, gradually disappeared. It underwent no apparent change of texture, but simply subsided. The swellings on the parietal bones also, the nature of which was not ascertained, cleared away ; and when the patient was last seen she appeared completely well, and no swelling could be observed.

Illustrations of Lupus.

CASE LVII.

Mr. Gascoyen's Case of Lupus Vorax.

J. F., aged fifteen, admitted into St. Mary's Hospital on January 30, 1871, under Mr. Gascoyen.

The boy is a native of Bedfordshire, short in stature and looks underfed. He states that his face had been affected for four years, but that he had no medical treatment for it until a few months ago, when he came up to a hospital in London (apparently University College Hospital), and was treated there for three months without much benefit; he then returned to the country, and was after a time seen by Dr. Lawford, of Leighton Buzzard, by whom he was sent to St. Mary's.

On admission, a large unhealthy ulceration occupied the centre of the face, extending from just below the inner canthus of each eye downwards to, and including, the upper lip; it was irregularly pyriform in shape, the apex corresponding to a line drawn across the centre of the bridge of the nose, and gradually widening till it reached the naso-labial fissure, which limited it laterally; its base accurately occupied the upper lip, which was much thickened by infiltration, and stood prominently forward from the teeth; these were permanently exposed from inabilty to close the lips except by an effort. The nasal bones and cartilage were entirely destroyed, leaving a flat surface from one cheek to the other, an opening about as large as a No. 10 catheter representing the nasal orifice, into which ulceration appeared to pass deeply; a copious discharge issued from it; no trace of the septum could be seen.

The ulceration measured about 3 inches vertically long, $2\frac{3}{4}$ inches at its widest part, it was covered with greyish tenacious slough, and secreted a thin semi-purulent matter; when a portion was wiped clean very red, but glazed and large granulations formed its surface. The margins were raised, red, and irritable, with exudation extending a little way into the adjoining tissues, and slightly painful when touched. The lip was very painful, and treble its normal size from effusion into it; the ulceration did not extend on to its inner surface. The lachrymal ducts on both sides were more or less obstructed, preventing the free escape of the tears. There was an open sore over each sac resulting from an abscess, which discharged watery purulent fluid, and a collection of similar fluid took place in the inner angles of each eye, requiring the constant use of a handkerchief.

The following treatment was given:—Ferri Tartarati, gr. vij.; Liq. arsenicalis, ℥iij; infusi quassiæ. f. oz. *t. d.*, with a drachm of cod liver oil.

The part kept moist with lint steeped in a lotion of acid. Carbolic, 48 grs., aquæ camph. ʒvj, and a liberal diet.

He improved much under this, both locally and generally; on March 13th the medicine was changed to liq. Donovan, ♏8; pot. iod. gr. ij; aquæ menth. pip. ʒj. *bis die*, as the ulceration of the lip was extending as to its inner surface; and strong carbolic acid was applied to this part. The whole of the upper portion of the face was completely healed as low as and including the nasal opening, from which no matter now issued, the sore over the left lachrymal sac was healed, but that over the right remained open. About the 20th of March the upper lip split completely in half, whilst the boy was laughing, exposing the incisor teeth largely. The lip was touched regularly twice a-week with strong carbolic acid, and the above treatment continued with much advantage, the ulceration gradually healing, until only the opposed margins of the fissured lip and its under surface remained unhealed; occasionally a spot at the edge of the cicatrix on the cheek would give way, but soon healed after the application of strong carbolic acid, and no tendency to re-opening of the scar showed itself. Towards the middle of May ulceration began to spread on the outer surface of the lip, and the use of the carbolic acid was discontinued, but the lotion was gradually increased in strength from 48 grains to 90 in 6 ounces of water; on the 25th black wash was substituted. On June 1 the medicine was discontinued, some wine given, and the use of carbolic acid lotion resumed (48 grs. ad. ʒvi), together with the strong carbolic acid twice-a-week, but as the lip became very painful, and the cheek adjoining began to be implicated, these were replaced on June 20 by a lotion of 6 grains of morphia to an ounce of water, and 3 grains of iodide of potassium with cod liver oil given three times daily. The condition of the boy is now (June 27) as follows: The opening over the right lachrymal sac remains; the cicatrix over the nose and cheeks adjoining continues firm, and looks quite healthy; the orifice of the nose is healed and contracted, so that it would admit about a No. 7 catheter; there is no discharge whatever from the interior of the nose. The upper lip is largely destroyed, the remnant of its two halves widely separated, so that the four upper incisors are seen with the gum adjoining, the ulceration has reached the angles of the mouth, and has slightly encroached upon the lower lip; this is beginning to get thickened about the commissure, so as to cause protrusion, and prevent its being applied to the teeth, which are now getting exposed, and saliva dribbles from the mouth. Disease is extending on the cheeks in the neighbourhood of the mouth, but is invading new tissue rather than cicatrix, and for the last week has extended rapidly.

CASE LVIII.

Dr. Hillier's Case of Lupus, treated by Caustics, and Mr. Bruce's Gas-Cautery.

John M., aged seventeen, first came under Dr. Hillier's care in the beginning of November, 1864. He then stated that his father and mother were living and well, and that he had brothers and sisters who were all healthy and living. His own health had always been and was at the time good. About a twelvemonth previous to his applying at University College Hospital, he had noticed a small pimple which made its appearance at the junction of the right ala of the nose and cheek, and which gradually increased in size till it became as large as a farthing, when it began to ulcerate at its right margin. The ulceration spread till it involved the whole of the lower part of the lower lip, corresponding to it in breadth. There was a little thick yellow discharge coming from it; he had no pain in it, and never had any. When he was first seen by Dr. Hillier, he had some slight enlargement of the glands of the neck, but they were not tender; his skin was smooth, and he had no eruption: the only part affected was the nose and upper lip. On the lower part of the nose, occupying the whole of the right ala and part of the left (but not the septum), and also that part of the upper lip corresponding to the nose in breadth, there was a thick crust, irregular in outline, dry, and at the upper part very adherent. The crust was thin on the lip, and exuded pus on pressure, but it was one-third of an inch thick on the nose, and overhung the surface on which it was seated, blocking up partially the entrance to the nares. The patient could not blow his nose. On detaching part of it on the left side of the lip, the subjacent surface bled, and was seen to be covered with coarse granulations.

Since November, 1864, to the present date (June, 1867), the patient has been under Dr. Hillier's care. He had poultices applied over the part at first, and took iodide of iron and cod liver oil; iodine paint was applied two or three times a-day for a week without any appreciable good result being obtained, when an ointment made with equal parts of bin-iodide of mercury and lard was substituted. This having the effect of destroying the granulations and depressing the surface, the iodine paint was again had recourse to. Subsequently, when the disease showed a tendency to spread downwards, potassa fusa was applied to the margin of the ulcerating surface.

On January 14th, while the patient was under the influence of chloroform, the acid nitrate of zinc (nitrate of zinc, twenty-five grains, strong nitric acid a drachm) was applied to the whole surface by Mr. Marshall. Great pain was complained of on the following day, which was relieved by the internal administration of opium. In a few days the ulcerated surface

cicatrised partially only, and the remainder was covered with granulations bathed in pus.

Since then the diseased parts have been cauterised several times, and the operation has always been followed by some amendment. Last week cauterisation was again had recourse to, and on this occasion an ingenious cautery, lately suggested by Mr. Bruce, was employed. It consists of a more or less conical piece of platinum, of variable size, which is heated by a jet of ordinary coal gas, the heat of which is intensified by means of a blowpipe. The gas is contained in an india-rubber ball, from which proceeds a tube of the same material, terminating in one made of platinum, along which the blowpipe is placed. By means of a second india-rubber tube affixed to the blowpipe, the operator can from a distance blow into the jet of burning gas, and thus considerably increase its intensity. This gas-cautery recommends itself by its portability, although it seems to lose its heat very quickly, and to be extinguished by the blood poured out by the cauterised surfaces.

The day after the operation the patient complained of no pain whatever, and the aspect of the diseased part was more favourable than it ever was before. As regards the purely medical treatment, the patient has for for some time past been taking ten minims of Fowler's solution three times a-day, and three grains of calomel every other night.—*British Medical Journal*, January 22, 1867.

CASE LIX.

Dr. Tilbury Fox's Case of Syphilitic Acne, simulating Lupus.

The following case is instructive in regard to (1) the differential diagnosis of lupus and syphilis, and (2) the treatment. The recognition of the disease as syphilitic demanded a plan of treatment wholly different from that which is called for in lupus, especially in reference to local applications.

The case was that of a single woman, C.W., aged thirty, who was admitted January 14th, 1868. As she entered the room, the patient seemed to present a large patch of ulcerating lupus occupying the *left side of the nose in its lower two-thirds.* The patch had a dull red areola, but not of any very great extent ; it did not sensibly exude ; it was tolerably clean, and inclined to scab here and there. It was not painful, nor had it been so. The diseased surface, as a whole, was depressed below the level of the surrounding skin ; and on closer inspection appeared to be uneven, being marked by depressions or pits, which were seen to be small ulcers, and in addition elevations, several of which were capped with little points. On questioning her, the following history was elicited. The woman suffered

from primary syphilitic disease eight years since, which was neglected. This was followed by secondary mischief shortly afterwards. Five years ago "spots" appeared on the head, face, and legs; those on the latter were replaced by "ulcers." Scars now mark the site of those on the side of the head. The patient was at different times in St. George's, Charing Cross, and Westminster Hospitals for severe pains in different parts of her body dependent apparently upon the syphilitic infection, for which she appears never to have been fairly treated. In one hospital she had her head shaved, was leeched on the scalp and temples, was blistered on the head and behind the ears, the blistered surface being kept open by the use of "green" ointment. On leaving the hospital no better, she seemed to have been treated by iodide of potassium, and became pretty well. But she had always had aching pains in her limbs, and referred to them as having caused her much suffering. She had been and was leading a fast life, was attacked by very low spirits, and fretted much. For some little time before the present illness, save the aching in her bones and head, she had been pretty well, but the pain had been so bad that she had "been obliged to get out of bed to sometimes get cool." Three months ago she had "pleurisy" after being wet, and went into hospital. Previously to admission, an eruption showed itself at the side of the head, just in front of the ear, in the shape of four inflamed pimples, which became after a time "mattery." Similar places appeared in the head, and these remained much the same throughout in regard to appearance. There were now about twenty pustules near the ear, which were isolated, and these were intermingled with little depressed scarrings. On the lower part of the cheek on the same (left) side was a patch of the size of a fourpenny-piece, made up of a few pustular elevations (acne-iform). During the woman's stay in the hospital small pimples came on her nose, and she thought they were "flesh-worms." After a while they increased in number, becoming confluent, and produced a large ulcerated patch as described at the outset. Dr. Fox pointed out that the disease bore close resemblance to lupus, and especially to what had been termed "follicular lupus," which was a misnomer. The follicles might be specially involved in lupus, but this was no reason for naming the variation a special disease. The character of the disease on the cheek was an ample clue to the nature of the alteration of structure about the nose. The distinct origin from acne-like spots of an indolent, painless nature, leaving in progress of disappearance marked pitting, sufficed for diagnosis from lupus which commences by tubercle. No doubt the disease on the nose was in reality a syphilitic acne produced by the crowding together of separate pustules corresponding to the glands (which were large and well developed in the patient), and breaking out into pretty free ulceration. These different features were well made out at the time of the patient first

coming under observation. Against lupus, were the origin by pustules, the continuous nocturnal pains in the head and the limbs, the history of syphilitic affection, slight faucial redness, with old scars, &c. Menstruation had not occurred for three years. It also seemed that irritants had been used to the diseased nose, and had increased the ulceration. The woman was put upon Plummer's pill and iodide of potassium in increasing doses, and was told to use warm fomentations and apply zinc ointment. On the 26th she had rapidly improved, all pustulation had gone, and the healing process had nearly removed the ulceration; in fact, there existed only a red patch with little dry pits, the pains in the head and limbs had gone, and the woman had been "unwell," and expressed herself as being better than she had felt for a long time. Dr. Fox observed that a mistaken diagnosis would have led to the employment of caustics, most likely with the probable increase of ulceration, and certainly of the subsequent scarring, which is now comparatively slight. In other parts of the body, as the legs, caustics have been applied to former eruptions, and large and well-marked scars are left. Care in the use of caustics in syphilis was urged in regard to all parts where disfigurement would be inconvenient. In lupus, however, the case is different; hence the importance of a correct diagnosis in ulcerating diseases, especially of the face, and the desirability of employing prompt and judicious constitutional treatment.—*British Medical Journal*, September 5, 1868.

CASE LX.

Mr. Moore's Case of extensive Rodent Cancer of the Face, commencing on the Nose—Operation—Recovery.

George W., aged fifty-nine years, sent from Congleton by Dr. Beales, in August, 1865. In the middle of the face was a vast ulcer, laying into one cavity the nostrils, right orbit, and mouth. Its highest part was narrow, and reached a little above the level of the eyebrows; its lowest part was formed by a deficiency of all but the outer half-inch of the upper lip on each side. In the interval it extended from within a quarter of an inch of the left tendo oculi across to the middle of the right lower lid. The entire nasal part of the face was gone, with the inner part of the right orbit, and the globe of the right eye was exposed.

The character of the disease was that of a solid deposit, advancing towards the healthy structures and followed so closely by ulceration, that the edge nowhere reached the thickness of a quarter of an inch. . . . The man looked robust. He was short and thick set, and what remained of his face was well nourished and ruddy. . . . He had had the disease twenty-six years. It had begun on the right side of the nose, as a small,

red pimple, in a pit left after an attack of smallpox, which occurred in his infancy. It spread in all directions, and it had never entirely healed, although he had undergone treatment when it was smaller, and the sore had been nearly healed for more than a year afterwards. Three years ago the ulceration was not larger than a half-crown piece. His exercise, general health, and work were not interfered with, and he had supported himself, married, and had a large family of children since the commencement of the disease. The most comfortable application to the ulcer proved to be a mixture of glycerine and starch.

September 4th.—I removed all the solid deposit by galvanic cautery. The trench sunk by the hot platinum was even, dry, and black. I could not remove the diseased part of the nostril with it, or those near the globe of the eye. These I partly cut away with scissors, and then over the whole surface applied the chloride of zinc paste. He was not under the influence of chloroform during the latter part of the operation. Severe pain and some mental disturbance followed; but on the separation of the sloughs he was so far recovered that he was sent home on the tenth day after the operation. On November 23rd he returned to the hospital, having latterly resumed light work, still suffering slightly from giddiness, but without headache or other head symptom.

The aperture in the face had remarkably contracted, but the eyeball being influenced in consequence of exposure, it was removed on the 24th. Mr. Moore also removed the lower lid and its mucous membrane, and attached the upper lid to the adjoining part of the cheek. This lessened the deformity. Before he returned to Cheshire an artificial nose and mask were made for him, and improved his appearance very considerably.

July 7th, 1866.—He has a small concave ulcer at the inner corner of his remaining eye. It is pale and without granulations, and its hard margin involves the inner extremity of each lid. The front of the inferior turbinated bone is covered with scab, and appears likely to be ulcerated. The front of the right superior maxillary bone, where exposed, is pale and covered with slightly elevated separate granulations, which bleed when roughly touched.

All these I removed, either by caustic or by knife and chloride of zinc combined.

I saw him in August, 1866, with the parts nearly healed. His health and vigour were good, but he died in April, 1867. The report was that "some vessel on the brain was affected and gave way." (Abridged from Mr. Moore's Report in his work on "Rodent Cancer," pp. 92 et seq.)

CASE LX A.

Author's Case of Injury to the Face, leaving a Fistulous Opening into the Antrum, which was closed by a Plastic Operation. Great Deformity of the Features: the Distortion in part remedied by Plastic Operations. ("British Medical Journal," Jan. 16, 1875.)

James C., aged twenty-five, was kicked in the face by a horse, ten years ago. While training the horse, by whipping it round in a circle with a long leading-rein, the animal suddenly backed on him and kicked him violently in the face. He was knocked down, and when picked up the left side of his face was, as he described it, lying on his left shoulder. There was still evidence that both jaws must have sustained compound comminuted fractures; the nose was split open nearly vertically, and the anterior wall of the antrum broken into through the integuments of the cheek. The contraction of the cicatrices formed during the healing of these injuries, resulted in a drawing down of both the left eyelids to a point above the middle of the inner side of the nose, so that the patient was unable to open his left eye by any movement of the muscles attached to the eyelids, though when the palpebral aperture was dilated by the fingers, the eyeball was seen to be perfect, and the sight of the eye itself was unimpaired. The jaws were much distorted, and could only be opened to a limited extent. Nevertheless, mastication and articulation could be very fairly performed. In the middle of the left cheek was an opening communicating with the antrum, and the skin surrounding this opening was drawn down towards it in the form of a funnel-shaped depression.

The above description applies to the condition of the patient when he was admitted into the Great Northern Hospital, in July, 1874, for the purpose of having an operation performed, designed to restore binocular vision.

Having several times successfully operated for ptosis, by removing portions of the upper eyelid, and so bringing the eyelid within reach of the fibres of the occipito-frontalis, Mr. Watson proposed a series of plastic operations in which this principle might be rendered available.

On July 16th, chloroform having been administered, a flap was taken from the upper eyelid, of a somewhat elongated oval form, and inserted in a raw surface left by making a free incision below the lower eyelid, dissecting the skin upwards, and freeing it by making deep cuts into the hard fibrous cicatricial tissue, by which it was bound down to the upper jaw. The edges of the wound in the upper lid were then brought together, and the flap retained in its new position below the lower lid by sutures. The whole of the parts operated on were then covered by a layer of cotton

wool saturated with styptic colloid. In this operation care was taken to dissect up the lachrymal sac with the inner end of the eyelids. An attempt was made to draw up the flap thus formed, without dividing the lower end of the sac and the commencement of the nasal duct, but this was found to be impossible ; the lower end of the sac was, therefore, cut across, and the divided ends separated in the act of drawing the eyelids into their new position. Notwithstanding that a portion of the transposed flap underwent considerable shrinking, and partially sloughed, the ultimate effect of this operation was a decided gain. The inner canthus was raised half an inch higher than the outer, which was before the higher of the two ; and there was a slight power of raising the upper lid, so that the patient could see before him when he held his head up and threw it back slightly.

It was, however, necessary to raise the outer canthus ; and, in order to do this, on August 26th, an operation of a precisely similar kind was performed at the outer side of the eye, the flap being taken from the skin and subcutaneous tissues, including muscle, of the outer half of the upper eyelid, and this flap transposed to a gap made by a horizontal incision below the outer two-thirds of the lower lid. Styptic colloid was applied to these incisions as in the former operation. The result of this operation was to increase very considerably the power of opening the eyelid, the level of the palpebral aperture also being very much raised ; but the outer half of the upper eyelid remained everted slightly, and this unsightly effect was subsequently remedied by removing the protruding portion of the conjunctiva and a small piece of the tarsal cartilage.

On October 14th the following operation was performed for the closure of the antral fistula, which lay at about the middle of the cheek, in a hollow, close to the side of the nose. Three flaps were taken from the skin of this hollow by dissecting them from the central aperture outwards ; the two lowermost flaps were then brought together by quilled sutures, so that their deep surfaces were in contact, in the form of a raised eminence, over the site of the depression, and the uppermost flap was attached to a point above them near the root of the nose, its lower edge being also attached by sutures to the upper borders of the two lower flaps. Styptic colloid was then applied in the way usually employed at the Great Northern Hospital.

On the fifth day after this operation the crust of colloid fell off, and the flaps were to be seen in good position, and in great part united by primary union. On the fifteenth day the wounds had become completely healed, and no trace of the fistula remained. A prominent nodule of redundant skin marked the union of the two lower flaps by the quilled suture.

When seen some months later, no trace of the fistula remained.

Cases LXI to LXVI—Illustrations of Diseases of the Lachrymal Passages.

CASE LXI.

Author's Case of Lachrymal Obstruction of a Bony kind—Use of the Conical Probe.

A seaman, aged thirty-five years, having suffered from watery eye for two years, and having been treated by various naval surgeons, and in a naval hospital without benefit, applied at the Central London Ophthalmic Hospital in December, 1868. The left lachrymal sac was enlarged and prominent, and pressure with the finger caused purulent regurgitation. The lower canaliculus laid open by Bowman's knife. Small conical probe passed, and bony obstruction met with in the nasal duct. The nose seen to be distorted by loss of bone on the side opposite to the lachrymal obstruction. Four days after large conical probe passed, and sac injected with solution of sulphate of zinc. On the 24th day of treatment, swelling and mucous regurgitation quite gone and no overflow of tears.

CASE LXII.

A Case illustrating the Use of Injections of the Sac in old-standing Obstructions of the Lachrymal Passages, under the care of the Author.

A woman, aged thirty years, had suffered when admitted into the Ophthalmic Hospital, in January, 1869, from watery eye of the left side for three years. Lower canaliculus slit, and Bowman's No. 4 probe passed. Four days later, a conical probe passed and zinc lotion injected. On the 15th day, there was still purulent regurgitation, but on passing a medium-sized probe no obstruction could be found. On the 29th day sulphate of zinc injected, and again a week later. It was now found that the entrance of the canaliculus into the lachrymal sac was narrow and obstructed. Bowman's knife was therefore passed in, and the outer wall of the sac opened freely. Injections were then repeated twice a-week, and at the end of the sixth week from the commencement of treatment the patient was discharged cured.

CASE LXIII.

Author's Case of Lachrymal Fistula, due to the Poison of Glanders.

A. F., a horse-slaughterer, aged thirty-four years, came from a town in Wales to the Ophthalmic Hospital, with a ragged, indolent ulcer on the

cheek over the region of the left lachrymal sac. It was attributed by him to inoculation with discharge from a glandered horse fourteen weeks before admission; he had no other sores about him. The sore presented flabby serous granulations, and its outer margin was excavated, as if spreading in that direction. When pressure was made over the sac, a puriform discharge escaped on to the ulcer.

The lower canaliculus was divided by Bowman's knife, and after some difficulty a small probe was passed through a very tight stricture in the sac.

Nitric oxide of mercury ointment was applied to the sore, and probes passed every other day, their sizes being gradually increased until a full-sized probe could be easily introduced. At the end of a month, the sore had so far healed that the patient returned home to Wales. On May 9th (three months after the commencement of treatment) he writes word that, "the ulcer on the face is nicely healed, except a very small sinus, through which sometimes oozes a tear." He had had ulcers of the throat, but of what nature he was unable to explain. His general health had much improved.

CASE LXIV.

Author's Case of Lachrymal Fistula.

Mrs. T., aged 56, was the subject of lachrymal fistula, of old standing, in July, 1869. In August, 1869, after an operation for cataract, acute suppuration of the lachrymal sac came on, and copious mucous regurgitation on pressure, which continued till October. October 29th, the canaliculus laid open into the sac, its internal orifice being obstructed, and a large conical probe passed through the sac into the nasal duct. At the same time the edges of the fistula were pared and lunar caustic applied. Probes were passed every other day for a week, and a soft silver style inserted and retained for ten days, when regurgitation of mucus having disappeared, it was removed. A minute fistula still remained, but there was no overflow of tears. In March, 1870, five months after the removal of the style, a return of the fistulous discharge and swelling of the sac necessitated the reinsertion of the style, which was worn continuously for six weeks. During the last ten days I found that the fistula had closed by a firm cicatrix, and the overflow of tears had quite ceased. When seen a fortnight later, there was no mucous regurgitation, and no epiphora, and the patient considered herself quite well.

CASE LXV.

Author's Case of Epiphora, due to Syphilitic Periostitis—Disastrous Result of the Use of the Style.

A man, aged about 30 years, who had suffered from constitutional syphilis, with severe nocturnal pains in the head, was also troubled with a constant watering of his right eye, accompanied by some amount of tenderness over the region of the lachrymal sac of the right side. The surgeon who saw him laid open the canaliculus, passed a series of probes, and subsequently introduced a leaden style with the effect of relieving all the symptoms of obstruction. But the patient now began to complain of having a constant offensive smell in his nostrils, and a discharge from one of them, and in a few weeks an abscess formed in the front of the upper alveolar ridge, *not* on the side on which the probes had been passed, but under the nostril of the opposite side. Soon, however, it became evident that this abscess communicated with a piece of necrosed bone, and that this piece of bone was continuous with a large sequestrum starting from the nostril first affected, and involving a large portion of the alveolar ridge.

It is, of course, not by any means clear that the probing and wearing the style had any direct influence in causing necrosis, but the fact of its having occurred after the use of the probes and style in a man who was suffering from constitutional syphilis, renders it probable that the bone mischief was aggravated, if not excited, by their use.

CASE LXVI.

Author's Case of Lachrymal Abscess associated with Syphilitic Disease of the Nostrils and Caries.

A woman, about 35 years of age, married, and with two living children, presented herself at the Great Northern Hospital with a threatening of lachrymal abscess of the right side. On examining the region of the sac there was redness and swelling, and excessive tenderness of the bones around. The abscess was opened on the cheek, and temporary relief obtained. No probing of the sac or duct was attempted. It appeared from her history that she had been the subject of primary syphilis soon after her marriage ten years before, and that she had since suffered from secondary and tertiary forms of the disease. The soft palate was eroded by old and recent ulcers, and the nose had recently been discharging, the discharge being very offensive.

Douches of water, with Condy's fluid, were used freely to the nostrils, and the iodide of potassium given internally, the ulcerated surfaces within the nostrils being occasionally touched with caustic. The disease however progressed, and on several occasions small pieces of bone

escaped, one of them evidently from the region of the inflamed sac. The ulcer on the cheek then healed, and the overflow of tears ceased, and after a course of arsenic, iron, and cod liver oil, the ulcers within the nostrils also healed, but not before the septal cartilage had been entirely destroyed. The woman's health rapidly improved under the treatment by arsenic and iron, and she has now had no return of ozæna, nor of overflow of tears, for several months.

CASE LXVII.

A Case of Maggots in the Nose, causing its complete destruction and the death of the Patient. ("*Indian Medical Gazette*," *August*, 1871.)

A man, during a period of insensibility from a remittent, had maggots breed in his nostrils, and, notwithstanding all that could be done, the case went on from bad to worse. Notwithstanding injections of various kinds, —black wash (generally very efficacious), carbolic acid, turpentine and oil, &c., the worms gradually destroyed the bridge of the nose itself, ultimately opening the pharynx and displaying in the ethmoidal cells, or rather in the position of the latter, a moving, loathsome mass of maggots and decaying tissue. Very many worms were daily, or even hourly destroyed by the constant use of injections, or by picking them out with forceps. But their name was legion, and the destruction of those in front seemed only to clear the way for the appearance of increased numbers. Ultimately coma supervened, and death took place under this condition. The author remarks, "I have treated many cases of penash, and previously witnessed fatal terminations in persons brought after the disease had far advanced, but I never before treated the malady from the commencement when, in spite of all endeavours, it persistently continued from bad to worse. But this result may probably be attributed to the very weak state of the constitution before the man became the victim of worms in the nose."

Cases LXVIII to LXXa—Illustrations of Distortions of the Nose.

CASE LXVIII.

Author's Case of Congenital Distortion of the Septum Nasi simulating Polypus.

A tradesman, aged 60 years, was recently (October, 1874) under my care. His nose is very much distorted, and his voice is nasal; the right ala and

right nostril are much larger and more prominent than the corresponding parts of the left side. The bridge of the nose is flattened out. His peculiar nasal voice and the appearance of the side of the nose made me suspect polypus, but on examining the right nostril I found it widely patulous, in consequence of a hollowing out and bending of the septum to the left side. Looking into the left nostril the septum appears to touch the outer wall. He can breathe through both nostrils, but, when blowing his nose, much less mucus comes from the left than from the right nostril. Such a case could not lead to any serious error in diagnosis, because, when seen from the outside, it would have been suspected that the right side of the nose was occupied by a growth of some kind, but when looked at from below, it was the left nostril that was found obstructed. The patient stated that he had had the deformity from his birth.

CASE LXIX.

Mr. W. Adams's Case of Depressed and Bent Cartilaginous Septum of the Nose, rectified by Forcible Straightening One Month after the Accident.

L. L., aged 16, was brought to me on the 12th July, 1861. He had received a blow on the nose a month previously, from a cricket ball at Eton, and two surgeons who had been consulted considered that nothing could be done. The external deformity was slight, consisting of a depression a little above the tip of the nose, at the junction of the cartilage with the bone, with some lateral inclination of the former; but since the accident, the voice had become completely altered, and the breathing through the right nostril much interfered with.

On examination, I found the right nostril obstructed by the cartilaginous septum, which had been bent by the blow from the cricket ball, and now projected into the cavity of the nostril, so that a probe could not be made to pass through it.

The cavity of the left nostril was much enlarged by the depression and bending of the cartilaginous septum into the right nostril. Considering all the circumstances of this case, I advised that some attempt should be made to straighten the septum, in the hope both of rectifying the deformity and restoring the voice, and in both these respects the result was successful.

On the following day consent was given by the parents, and I gave instructions to Mr. Blaise to prepare the forceps, screw-compressor, and ivory plugs, which are represented in figures. (Figs. 22, 23, and 24, pp. 305 and 307.)

On the 16th July the first attempt to straighten the septum was made with only partial success, in consequence of the patient not being allowed by his father to take chloroform, and the pain and sneezing rendering it

impossible to proceed. The steel screw-compressor was, however, worn for three days and nights, and afterwards the ivory plugs were used with as little intermission as possible. This did not cause much pain or inconvenience, and the improvement was very decided, although incomplete. Consent to the exhibition of chloroform was now obtained, and

On the 30th July I repeated the operation, the chloroform being administered by my friend, Dr. Allan, the medical attendant of the family. I now completely straightened the septum, and the obstruction of the right nostril was at once removed, so that the forceps with the blades closed could readily be passed through it. The retentive apparatus was used as before, the ivory plugs being used at night for several weeks. It was not necessary to repeat the operation, the external deformity was so far removed that a trace of it only could be said to remain, and the voice was completely restored.

CASE LXX.

Mr. Adams's Case of Fracture of the Nasal Bones with Depression and Bending of the Cartilaginous Septum, much improved by Forcible Straightening Six Months after the Accident.

This case was of a much more severe character than the preceding.

C. R., aged 22, an officer in the army, first consulted me on the 6th June, 1871, having sustained a very severe injury to the nose bya fall in the previous December. This gentleman was wearing one of the new-fashioned Ulster coats, and having both hands in the pockets fell down flat at a railway station, the nose coming in contact with an iron rail. The nasal bones had been fractured, and projected towards the left side. The cartilaginous septum was also much depressed and bent, projecting into the left nostril, whilst the tip of the nose was directed towards the right side, somewhat in the shape of a half-moon, giving to the face altogether a most unsightly appearance. In this case, also, more than one surgeon of eminence had been consulted, and the opinion given was that no treatment could be adopted with any probability of success. I advised the same treatment as in the former case, and this was assented to.

On the 9th June I performed the operation, chloroform being administered by Mr. Braine. The cartilaginous septum was straightened, but very little improvement effected in the position of the nasal bones. The steel screw-compressor was used continuously for three days and nights, followed by the use of the ivory plugs. The improvement, so far as the front part of the nose and cartilaginous septum were concerned, was satisfactory, but the nasal bones being still depressed and displaced towards the left side, I directed Mr. Blaise to construct a kind of steel truss (represented in fig. 25) to pass round the head, having a small oval

pad connected with the front part, and capable of accurate adjustment by means of two cog-wheels, so as to be applied to the left nasal bone, as a retentive apparatus, after the bone had been forcibly bent or re-broken—an operation which I performed

On the 21st June, when chloroform was again given by Mr. Braine. In this operation considerable force was employed in the attempt to bring the nasal bones into their natural position, by a firm and long-continued pressure on the left nasal bone. Very considerable improvement was effected, and the steel truss and pad were immediately applied as a retentive apparatus. I also more completely straightened the cartilaginous septum, and the steel screw-compressor followed by the ivory plugs was used to support the septum, at the same time that the truss was applied to support the nasal bones externally.

After this operation the progress was satisfactory, and the improvement very marked and well maintained; still, however, from the severity of the case and its duration neither the depression nor the lateral deviation of the nasal bones was entirely removed, and

On the 5th July, 1871, I again repeated the operation, chloroform being given by Mr. Braine; still further improvement was gained with very little force, and the retentive apparatus used, as before, for several weeks.

On the 27th November, when I saw him for the last time, I found the improvement had been well maintained, and the appearance of the nose so much improved that it would scarcely attract attention, and the result was considered to be very satisfactory.

CASE LXXA.

Mr. Adams's Case: both Nasal Bones evenly depressed between the Nasal Processes of the Superior Maxillary Bones, producing Flattening of the upper part of the Nose. Cartilaginous Septum also depressed and bent, projecting into the right Nostril. The tip of the Nose deviating towards the left side.

This differed considerably from the preceding cases. Miss F., aged 11 was sent to me by my friend, Mr. Walter Coulson, on the 9th June, 1874, and the nose then presented the general appearance indicated in the above description. The accident occurred six years previously, when she was only five years of age, by her falling down a sloping bank forty feet in height, the nose coming in contact probably with a stone when she first rolled off the embankment.

In addition to the external deformity the breathing was very much interfered with in this case. The voice was also much altered, and an

offensive discharge constantly occurred from the nostrils, as in ordinary ozæna. No evidence of necrosis of bone could be obtained by examination with the probe, nor was this indicated by any tenderness to pressure externally. I therefore advised the operation of straightening as in the preceding cases.

On the 10th June, chloroform being administered by Mr. Braine, I straightened the cartilaginous septum with the steel forceps, and to some extent succeeded in improving the position of the nasal bones. The steel screw compressor and ivory plugs were worn without inconvenience, and

On the 2nd July I endeavoured still further to raise the depressed nasal bones, with the assistance of Dr. Sliman, of Hackney, who administered chloroform. The blades of the forceps were carried directly upwards, in a direction to elevate the nasal bones, and a firm lateral pressure, applied externally, at the same time. A marked improvement in the shape of the nose was thus produced, and the same retentive apparatus employed ; but it was difficult to maintain sufficient lateral pressure externally. The general improvement in the form and shape of the nose was considerable, and much of the depression removed. The offensive discharge from the nostrils entirely ceased, and both the breathing and voice were much improved. The nasal bones, however, still remain somewhat depressed, and I have heard recently (April, 1875) that there has been a partial return of the offensive discharge. I shall shortly have the opportunity of examining the case again.

Cases LXXI to LXXX—Illustrations of Intra-nasal Tumours and Naso-pharyngeal Polypi.

CASE LXXI.

A Case of Recurrent Fibroid Polypus, under the care of the Author at the Great Northern Hospital.

Robert J., aged 55 years, a labourer in the country, came to the Great Northern Hospital, in June, 1873, with an expansion of the bones and walls of the left nostril, which he said had been obstructed for seven years. The swelling had increased during the last eighteen months, and very rapidly within the last six weeks, and the surface had become of a slightly red colour, and the tears now constantly flow over the cheek in consequence of the obstruction of the lachrymal sac caused by the growth of the

tumour. The left nostril is occupied by a reddish growth, which looks and feels, when touched with the probe, much firmer than the ordinary gelatinous polypus. It bleeds very readily when touched, and when an attempt was made by a surgeon in the country to remove it by avulsion with the forceps, very free bleeding came on.

The evident firmness of the growth, as compared with the gelatinous variety, and its probably high attachment, made it extremely probable that this was a fibro-sarcoma, and forbad the hope of removing it by the avulsion method, or by the snare or ligature. The following operation was therefore performed, the patient being under the influence of chloroform on June 18th.

The left ala was separated from the cheek by an incision commencing from the inside of the nostril, and carried through the thickness of its attached border and upwards along the groove between the ala and cheek towards the inner canthus. The arteries divided in this incision were then tied and the flap reflected inwards, exposing a fibrous tumour of about the size of a walnut. Its high attachment could not be reached, however, without dividing the bone at about the junction of the nasal process of the superior maxillary and the nasal bone. This done, the root of the polypus was easily torn away by passing the forefinger behind it and thrusting it forwards. It was attached by a very broad base to the anterior and upper part of the outer walls and to a small portion of the cribriform plate of the ethmoid; the inner wall of the antrum had become much compressed and flattened in an outward direction, and one attachment of the tumour was at the margin of the orifice of the antrum, the two upper turbinated bones having been pushed aside and in part absorbed. Several separate gelatiniform masses were removed from the turbinated bones. The bones at the upper part of the cavity were well scraped by the gouge, and strong perchloride of iron solution was then applied freely to the surface of attachment. The edges of the wound were brought together with stout silver wire sutures, and the line of incision covered with lint saturated with carbolized oil (1 in 40).

The nostril was syringed out daily with a weak solution of carbolic acid (1 in 80), the discharge being for some days very offensive. There was also a slight threatening of erysipelas about the 3rd day, which, however, soon passed off under the stimulant treatment with perchloride of iron, and thenceforward the progress of the case was perfectly satisfactory.

Six months after the operation he returned to the hospital; the wound had been healed entirely some time, and the scar was only perceptible above the ala. The nostril was quite free from obstruction, and there was not the slightest overflow of tears. The patient expressed himself as being perfectly comfortable, and very pleased with the result of the operation.

The tumour, however, showed signs of a return about February, 1874, and a foul-smelling discharge began to escape from both nostrils. About the middle of April both nostrils were obstructed, and in the left there was a visible tumour of a greyish colour which bled on the slightest touch. Towards the end of the month he began to suffer from severe frontal and occipital headache, for the relief of which morphia was prescribed, first as pills and then in the form of hypodermic injections, but with only partial relief.

On April 29th, chloroform having been administered by Mr. Eastes, the old line of incision was reopened, and a large soft polypus exposed, occupying the whole nasal cavity as far back as the sphenoidal cells and pterygoid processes. The deeper portion of the tumour came from the sphenoidal cells, and in order to reach them it was necessary to split up the nasal bones and to cut away a portion of the nasal process of the superior maxillary. The whole mass of the tumour removed was of the size of a small hen's egg, but it was so friable that it was removed piecemeal by tearing and gouging, and the knife was not required. The bleeding from the superficial parts was very free, and there was also considerable oozing from the deep attachments ; but the application of the actual cautery to the former, and of a plug of cotton wool to the latter, effectually checked it. On the following day he was quite free from the pain, and expressed himself as greatly relieved, having slept well with the aid of morphia. On the 15th day the superficial wound had healed, but the discharges from the nostrils were very offensive, in spite of the use of frequent injections of solution of permanganate of potash.

On June 17th he became delirious, and in a few days died with symptoms of intracranial disease, the nostrils having, during the last few weeks, become again completely obstructed.

The nodules of the tumour, after removal on the second occasion, presented on section a white mottled surface with bloody points of extravasation, and had very much the aspect of brain tissue. Microscopically examined, they consisted of closely aggregated cells with granular contents and with no distinct nuclei. These cells had every variety of shape, and seemed to have assumed their various forms in consequence of very close packing. There was no intercellular matrix. A few of the cells were fusiform with large nuclei, but the majority were those of embryonic connective tissue, and, though very various in shape, were tolerably uniform as to size. The above description is taken partly from my own observations and partly from those of Dr. Thomas Parker Smith, who kindly undertook the microscopic examination of the tumour for me.

I look upon the tumour as fibroid or sarcomatous, and as resembling the recurrent forms of epulis or fibro-plastic tumours of the gums.

CASE LXXII.

Mr. Rouse's Case of Fibrous Tumour attached to the Basilar Surface, removed by Langenbeck's Method of Operation.

E. W., aged 14 years, deaf and dumb, was admitted into the hospital on the 5th of August, 1868.

History.—For some months has had gnawing pain in the right side of the face, which has been gradually swelling. For the last three months the *right eye has been pushed forwards and outwards.*

On admission there was slight fulness of the whole of the right side of the face. The right eyeball was protruded and pushed outwards, so that the eyelids could not be closed, neither could the eye be turned inwards. There were *fulness and hardness at the inner angle of the orbit.* The right nasal bone was considerably raised. On looking into the nostril, *a fibrous polypus* was seen reaching nearly to the outlet. No tumour could be felt in the pharynx.

On the 6th of August, the patient being under the influence of chloroform, Langenbeck's operation was performed, by which means the nasal cavity was well exposed. A pair of polypus forceps was then introduced, with which the polypus was seized and dragged out. The lachrymal bone was found to have been almost entirely absorbed, allowing the tumour to pass into the orbit and push out the eyeball. The polypus had been attached to the basilar surface. The edges of the wound were brought together with silver sutures. The patient progressed favourably, and was discharged cured on the thirteenth day after the operation.—*Lancet*, February 27th, 1869.

CASE LXXIII.

A Case of Fibrous Tumour of the 2nd Division of the 5th Pair, simulating a Nasal Polypus.

A blacksmith, with all the symptoms of polypus in the nasal fossæ, died of inflammation of the brain, following several ineffectual operations for the removal of the supposed polypus, when, at the autopsy, the following extraordinary disease was discovered :—"Puriform exudation was found at the base of the brain. As for the tumour of the nasal fossæ, it was formed by the second division of the fifth pair, which at its exit from the skull increased in size and formed a fibrous tumour, divided into five lobes, of which the two largest were each as big as peach-stones ; the other three were smaller, and one of them penetrated the orbit through the

spheno-maxillary fissure. This fibrous mass occupied the deep temporal fossa lying between the zygomatic arch, the malar bone, the outer wing of the sphenoid, and the posterior aspect of the superior maxillary bone. The tumour extends thus as far as the alveolar border, above the last molar teeth. There it turned back, penetrated the spheno-palatine foramen, which was enlarged sufficiently to admit the little finger. Arrived at the corresponding nasal fossæ, it was reflected, and formed a moveable tumour, which was mistaken for a polypus. None of the prolongations of this fibrous mass were mingled with or involved the nerves given off by the second branch of the fifth pair. The tumour sprang from the neurilemma." (Gerdy, "Des Polypes," p. 110.)

CASE LXXIII A.

Mr. Simon's Case of Abscess in the Brain from obliteration of the Carotid Trunk by the pressure of a Nasal Polypus.—"Medical Times and Gazette," January 19, 1858.

A pale, emaciated man, rather past middle age, was admitted, under Mr. Simon's care, into St. Thomas', on account of profuse bleeding from the nose. He was partially deaf. The left eye squinted inwards, and the right was totally blind, and had been so for some weeks. It appeared that so long as thirty years ago he had been under surgical treatment on account of a polypus in the nostril. Many attempts had from time to time been made to extract the growth, but had never been wholly successful. He was much reduced by loss of blood at the time of his admission, and a few days afterwards had an epileptiform seizure, which left him with incomplete hemiplegia of the left side.

Ten days later another fit occurred, and death in coma followed thirteen hours afterwards. At the autopsy a very interesting and most unusual condition of things was found. In the right cerebral hemisphere were three distinct abscesses, and the brain substance generally was much softer than that of the opposite side. The cause of these was found in the entire obliteration of the internal carotid artery by the compression and irritation of a large nasal polypus, which had grown upwards, and caused extensive absorption of the body of the sphenoid bone. It was impossible to trace the carotid artery through the cavernous sinus, its coats being inseparably blended with the dura mater, and old inflammatory material. The sphenoidal sinus was occupied by a mucous polypus. There was not the least reason to consider the polypus of a malignant nature, it being evidently of the ordinary fibrous kind. There were no secondary growths in any part of the body.

CASE LXXIV.

A Case of Fibrous Polypus of Nostril and Antrum raising up the floor of the Orbit. ("*Méd. Opérat. de Savatier,*" *edit. de Sanson and Regin,* tom. iii, p. 820, *and Gerdy* op. cit., p. 30.)

Lebret, a mason, aged 18 years, admitted into Hôtel Dieu, August 22, 1822, with a fibrous polypus, which filled the nostril and sinus maxillaris, the front of which it had perforated. The tumour formed a firm swelling, of the size of a fist, thrusting the zygoma outward and *raising the floor of the orbit a little.* The polypus did not come out elsewhere from the nostril, nor forward, and it was not degenerated.

Dupuytren had recourse to two operations. The first was performed on the antrum of Highmore. He incised the mucous membrane under the raised lip (lèvre relevée). He discovered the tumour and raised it with the forceps of Museux ; then he fixed successively, and at greater and greater depths, two other forceps, and by means of very severe traction succeeded in extracting the polypus. The blood flowed in a stream, and was checked by plugging. Ten days afterwards, with a forceps (à mors aplatis) with broad bite, and combined traction and torsion, he extirpated the division of the polypus which occupied the nasal fossæ. The patient went out quite cured on the thirtieth day after his admission. He went out without any scar, and only preserving as a souvenir of the operation the address of the surgeon who had saved him.

CASE LXXV.

A Case of supposed Syphilitic Sarcoma of the Pharynx and Upper Jaw, simulating Naso-Pharyngeal Polypus, under the care of the Author.

Susannah F., an apparently healthy girl, with a fresh colour and clear skin, aged 10 years, was first brought to Mr. Watson, at King's College Hospital, in April, 1863, on account of obstruction of the nostrils and a flattening out of the bridge of the nose, accompanied with severe pain. The flattening of the bridge of the nose and stuffiness of the nostrils had been noticed by the girl's mother about four months, and during this period several of the girl's teeth had become loose and had fallen out, so that she had lost all the incisors and bicuspids. She still, however, continued well nourished.

Her mother was a weakly, haggard looking woman, who had three other living children, and had had two miscarriages. The girl, Susannah, when an infant, had suffered from sores about the anus soon after her birth, but her milk teeth were sound and good, and there had been no eruption on her body.

The two nasal bones were both thrust forwards, the right being most prominent. She could force air through the nostrils with difficulty, and there was nothing abnormal visible through the anterior nares. Posterior rhinoscopy was attempted, but failed. She had a muco-purulent discharge, sometimes offensive, from the nostrils ; there was a softening and yielding of the front part of the alveolar ridge.

Passing the forefinger behind the soft palate, a firm nodular mass was felt projecting from the posterior aperture of both nostrils, but chiefly from the right. On the anterior aspect of the third and fourth cervical vertebræ a distinct enlargement was felt projecting into the pharynx (see fig. 35).

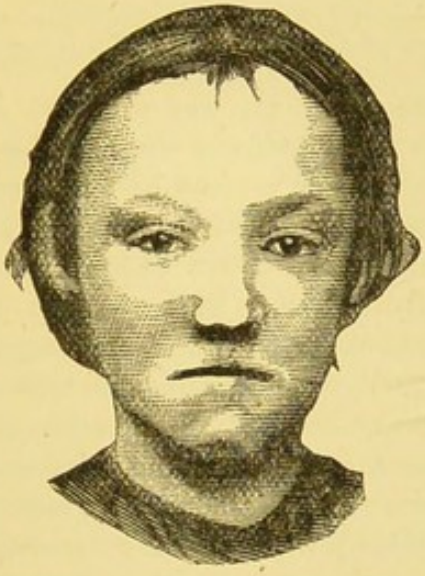


Fig. 35.

Case of Intra-nasal Syphilitic Sarcoma, simulating Nasal Polypus.

In February, 1864, the flattening of the nasal bridge and the distance between the eyes had increased, and the posterior nares had become still more obstructed, while the tumour in front of the vertebræ projects more and extends higher. There is now much difficulty in swallowing.

March, 1864. All the teeth have now fallen out of the upper jaw. She complains of severe pain at the back of the neck, but is otherwise in good health.

January 20, 1865. A nodal swelling has appeared over the left side of the frontal bone ; this swelling is very tender on pressure. The intra-nasal and pharyngeal tumours remain in much the same condition. The nodal swelling suppurated, and ultimately cicatrised.

January 1866. She has grown much taller and thinner, but the nasal tumour remains unaltered in bulk or consistence.

March, 1873. I had lost sight of this patient till she was again sent to me at the Great Northern Hospital, eleven years after I had first seen her. In this time she had grown very tall, but was miserably thin and cachectic. Her forehead was marked by numerous white cicatrices along the line of the eyebrows, the upper jaw was much shrunk and contracted, and her soft palate was perforated by several apertures and ragged openings, the results of old cicatrised ulcers. She says her nostrils are completely closed, but she can still breathe a little through the left. She has occasional bleeding from the nostrils and often very severe headaches.

CASE LXXVI.

Mr. De Morgan's Case of Large Fleshy Polypus of the Nose—Operation.

The patient, a man aged 41, was admitted on the 13th of April with a large polypus in the left side of the nasal cavity. It filled up the left nostril, and a large mass of it could be felt hanging down behind the soft palate. The left side of the nose was bulging, and the nasal bone was in great part absorbed. The left eye was protruded, and the orbit was evidently filled with the growth. There was no depression of the hard palate, or swelling in the cheek or the frontal region. No tumour could be seen in the right nostril, but he was unable to breathe through it.

His account was that he had had a stoppage in the left side of the nose last summer, and that four months ago the tumour had been detected in the nostril. Nine weeks before his admission, an attempt had been made to remove it in the ordinary way, but the hæmorrhage had been so great that it was given up. A week or two after a second attempt was made at another hospital, but was abandoned for the same reason. When he came here as an out-patient, the house surgeon again tried to remove it, but severe bleeding again came on, and he was taken into the hospital.

It was clear from the protrusion of the eye and of the side of the nose that, even if there were no hæmorrhage, the tumour could not be removed by the nostril. On April 21st, Mr. De Morgan made an incision through the lip, and carried it through the side of the nose to the upper end of the nasal bone, which was then cut through with a pair of scissors. The nasal cavity was thus exposed, and was found to be occupied *by a fleshy mass, which had its attachment to the bones forming the inner wall of the orbit.* These were in great measure absorbed, allowing of the growth to pass freely into the orbit itself. The whole mass was scooped away with the finger, the bleeding being less than when the attempt had been made to remove it through the nostril. The orbit was cleared from all the growth; none had passed into the antrum. The parts were carefully brought together, and united by primary union. The eye, which had been dim,

soon regained its position and clearness of vision ; and a discharge from the nostril, which was at first somewhat foul, was soon checked by injection of Condy's fluid. He was discharged well on the 18th May.

The growth was composed principally of round nucleated cells, of uniform size, with a very spare amount of connective tissue. It was, then, a form of sarcoma, in no way resembling the ordinary gelatinous polypus, and there is a probability of its recurrence. Its rapid growth and absorption of the bone around it led to the same conclusion.—*Lancet*, June 19th, 1869.

Mr. De Morgan has been good enough to inform the author that the disease subsequently returned, and a second attempt was made to remove it ; but it was found to have grown into the cranial cavity, and the brain was injured ; he died in consequence.

CASE LXXVII.

Mr. T. Holmes's Case of Naso-Pharyngeal Polypus, removed twice by Operation.

The patient, a man 35 years old, had been originally under treatment at St. George's Hospital, in 1866, for epistaxis, which was then supposed to be due to heart disease. Later, he was in another hospital for epistaxis, but no tumour was discovered. When the patient came under the care of Mr. Holmes there was no difficulty in seeing that there was a tumour projecting into the left nostril, and also hanging down behind the soft palate, and visible from the mouth. The growth bled readily, the patient had frequent epistaxis, was very pallid and weak, and spent most of his time in sleep. His condition not being such as to warrant any delay, the operation was performed as soon as possible, no anæsthetic being given. The whole of the superior maxillary bone, with the exception of the orbital plate, was removed, and the polypus, which was found to be attached to the body of the sphenoid, or the basilar process of the occipital bone, removed as soon as possible. Recovery was rapid, and the hole in the palate having been filled by an obturator, the patient left the hospital. For some time after the operation he seemed to have recovered perfectly, and the deformity remaining was very slight ; but about a year later he had slight epistaxis, of which, however, he took no notice. Two years after the operation he again had severe hæmorrhage, and was laid up for three months with epistaxis. He applied to some one, who thought the growth was malignant and that nothing could be done. A year ago, however, he came again to Mr. Holmes, expecting no relief, and there was then found to be a large mass projecting into the nose. By opening up the scar of the former operation, through the upper lip into the left nostril, the

tumour was again removed on December 3rd, 1873, and it was found possible to take it away almost entirely. The whole of the soft tissues were then gouged away from the base of the skull, where the tumour was adherent, and lint steeped in sulphate of copper solution applied to the surface. Severe hæmorrhage occurred during the operation, which was done without chloroform. The patient made a rapid recovery, and went out apparently cured. The tumours removed were, in both cases, of fibrous character, but in the case of the first tumour there were a few spindle-cells, whilst in the second the growth was more succulent, and contained more round-cells than spindle-cells.—*Lancet*, January 16, 1875.

CASE LXXVIII.

Case of Palato-Nasal Hydrencephalocele. (*Virchow*, "*Die krankhaften Geschwülste*," vol. i, p. 785, *Explanatory Note of the Woodcut.*)

A palatine hydrencephalocele in a new-born infant. From the gaping mouth projects an irregular-shaped, nodular tumour of the size of a small apple, and appearing to be fixed to the roof of the mouth. On making a slit it is seen that the palate and the vomer are bent outwards and upwards by the tumour, and that the tumour itself comes out of the cranial cavity by a large opening situated immediately in front of the sphenoid, and behind the still cartilaginous ethmoid. The front of the sphenoid is displaced downwards and forwards; its relations with the vomer are interrupted and the latter only articulates with the ethmoid. The anterior portion of the pouch (the tumour) consists of a cavity with smooth walls lined by the dura mater. There are besides several irregular cavities towards the lower and anterior parts; at its uppermost part a mass of brain substance is found, and this is continuous with the main portion of the brain within the skull. The brain itself is much compressed at its base, while the greater portion of the superior space is filled with liquid which is enclosed in a large cavity, partly surrounded by a thick membrane.

CASE LXXIX.

Mr. Bryant's Case of Naso-Pharyngeal Polypus

removed from a boy, aged 15, which had originally appeared in the right nostril, but had ultimately occluded both posterior nares, and pushed forward the soft palate. Severe epistaxis had repeatedly occurred, and ultimately there was difficulty experienced in swallowing. The écraseur was employed for its removal, but only a small and weak one could be introduced, and the screw could only be tightened gradually. In five days it came away, but the polypus did not fall off; for a time it appeared to

shrivel away, but in nine months the boy was sent back to Hospital as bad as ever. The tumour was again carefully examined, and was found to be attached to the posterior part of the pharynx. On this occasion whipcord was employed for its removal instead of wire as on the former occasion, and again the écraseur came away on the fifth day, but this time the tumour came with it. Mr. Bryant suggested that this might be a case of the kind reported by M. Guérin, where the tumour had two attachments. (*Lancet* Report of Pathol. Soc. Trans., March, 1867. The case fully reported in "Path. Trans.," vol. xvii, p. 107.)

CASE LXXX.

Mr. Lawson's Case of Gunshot Injury—Foreign Body in the Nares for Twelve Years—Removal—Recovery.

J. G., aged 28, was admitted into the Middlesex Hospital, under the care of Mr. Lawson, complaining of *a very offensive discharge from the nostril.* There was a deep scar just between the frontal sinuses, and *the right side of the nose in the upper part* was rather swollen. There was fairly marked exophthalmus, the right eye being more prominent than the left; the conjunctivæ were somewhat injected. On examination by the nostril it was found that a hard and moveable body was lodged beneath the scar, and in the upper part of the nasal cavity. The patient stated that twelve years previously his gun burst while shooting wild fowl, and produced a severe wound between the eyes, and many smaller ones in his face. He did not become insensible, and was able, with assistance, to walk home. He was laid up for four months, during which time his eyes became inflamed, and the room was kept darkened for a month or six weeks. The eyesight on the right side became completely destroyed: he has, however, been since able to distinguish light. The left eye was also slightly affected at the same time, but it completely recovered. He was occasionally delirious. The wound of the forehead discharged profusely for about a year, when it healed up, to break out afresh again and again. He observed *that, when the discharge appeared by the nostrils, the wound in the forehead closed.* He was attended through his illness by several medical men, but they never found, nor did they appear to suspect, the presence of a foreign body. The patient remained pretty well up to about three years ago, when he began to suffer from severe neuralgia on the left side of the nose and adjoining cheek. After nine months' suffering it left, and at the same time he felt a loose body in the nostril. He continued in this state up to the date of admission.

Operation.—Mr. Lawson first endeavoured to pull out the foreign body from the nose with a pair of strong forceps introduced through the nostril; but this he failed to do, as, although he could grasp it without any difficulty, yet it was too large to be drawn through the nostril. He therefore *laid open the right cavity of the nares by an incision carried through the nostril along the fold which forms the line of demarcation between the cartilage of the nose and face.* The piece of iron was then seized with the forceps, and, after considerable traction, removed; it weighed an ounce and a quarter, and was covered with a thin layer of rust (see fig. 36). The wound was united with two fine sutures. The patient recovered without a bad symptom, and in a week left the hospital. (Lawson, "On Diseases and Injuries of the Eye," 2nd edit., p. 336.)

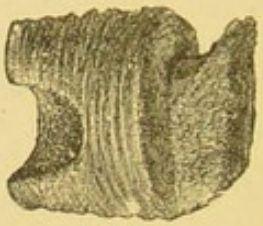


Fig. 36.

THE END.

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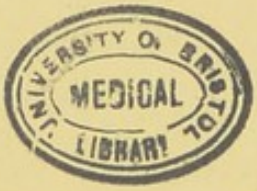
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