tissues. That was merely a generalization from what must obviously occur in the maintenance, for example, of surface squamous epithelium, where proliferation was confined to the undifferentiated germinal layer. It did not seem a great step from such a conception to Cohnheim's theory of cell-rests in relation to cancer. That cancer cells were able to remain in the tissues for considerable periods without appreciable proliferation was clearly shown by the experiments quoted by the opener of the discussion and by the numerous instances on record of metastases remaining dormant and inactive over many years.

Professor J. LORRAIN SMITH (Edinburgh) said that while recent investigation of tumour growth had dealt chiefly with etiology, the progress made had revived the question of the nature of the process. The discussion of this aspect of the subject had long been familiar in the contrast drawn between tumour, hypertrophy, repair, and regeneration. More recently cytologists had taken up the study of cell differentiation, especially in relation to changes in cytoplasm. The application of biological methods to corresponding changes in tumour cells was a problem for future investigation. A certain approach to it had been made in Unna's study of skin cancer. Adopting as a basis of classification the architecture of the normal skin, he opened up a field of investigation. In the lower layers of the rete mucosum the cells maintained active division and afforded an example of continued growth. On division of the cells in these basal layers the growth of the skin depended. Two types of cell were produced—one which remained a basal cell with power of continuous division, and another which passed from the basal layer to become a prickly cell, finally receiving the form and composition of a surface squamous cell. With this differentiation the power of division was gradually lost. There was, therefore, a double product from the original division. The architecture of the skin resulted from the production and maintenance of the two types of cell. In the one type there was continued division originating new basal cells, and in the other there was differentiation in the direction of keratin scale formation, and the power of division was lost. The haemogenetic tissue afforded another clear example of biological architecture. The primitive blood cell in division, continuously maintained, produced cells which remained primitive blood cells, and, at the same time, cells to become gradually transformed into red corpuscles; these, like the squamous cells, had lost their power of division. In cancers of the skin, as Unna had shown, the normal architecture was disturbed in a considerable variety of ways. With this principle of interpretation as a guide he reached a classification of cancer of the skin according to the type of disturbance. Whatever might have been the result of recent work on etiology, it must be acknowledged that it had provided a new means of investigating experimentally the process of cancer growth in relation to the process which in the normal tissue resulted in its biological architecture.

LACRYMAL OBSTRUCTION: ITS NASAL ORIGIN AND INTRANASAL TREATMENT.*

BY

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THE exact pathology of lacrymal obstruction is still somewhat obscure. The part played by diseases or abnormalities of the nasal passages and accessory sinuses is considered to be more important than descending infections from the conjunctival sac. According to Kühnt, nasal diseases are responsible for 93.7 per cent. of cases of lacrymal obstruction, while a leading textbook on ophthalmology quotes as causes: inflammatory conditions of the nasal mucous membrane; simple catarrhal tuberculosis, and syphilis; ulcers of the nose, tuberculous, syphilitic, and lupoid; and nasal tumours, especially polypi blocking the lower orifice of the nasal duct. Brückner, although he regards nasal causes

as uncommon, admits that in the majority of cases diseases of the lacrymal apparatus are nasal in origin.

The purport of this paper is to report the results of an investigation into the nasal condition of 120 cases of lacrymal obstruction observed by me during the last four years through the kindness of my colleagues at the Manchester Eye Hospital.

Incidence.

The susceptibility of the female sex to lacrymal obstruction is a well known fact, and has, I believe, never been satisfactorily explained. In the present series 102 cases occurred in females and 18 in males.

The following table giving the age incidence of the disease shows that the greatest number of cases occurred between the ages of 30 and 60, but that of the three decades in this period the numbers of cases were practically equal.

1-10 years	...	...	...	...	...	4 cases
10-20	"	...	...	...	...	5 "
20-30	"	...	...	...	...	12 "
30-40	"	...	...	...	...	26 "
40-50	"	...	...	...	...	34 "
50-60	"	...	...	...	...	25 "
60-70	"	...	...	...	...	9 "
over 70	"	...	...	...	...	3 "

The oldest was 74 and the youngest 6 years. The shortest duration of symptoms, such as epiphora, was six months; the majority, however, had presented symptoms for two years or more.

Etiology.

Injury.—Any injury in the region of the inner canthus producing either a fracture of the infra-orbital margin or of the frontal process of the superior maxilla may mechanically obstruct lacrymal drainage. Similarly a chronic traumatic periostitis in the region of the lacrymal fossa following injury without fracture might be an etiological factor. A definite history of injury was obtained in only 5 cases (4.1 per cent.): 2 developed an abscess over the sac immediately following the injury, with subsequent epiphora, whilst 3 presented a definite scar, and in all the epiphora began immediately upon receipt of the injury.

Breadth and Width of Nose and Nasal Passages.—Whitnall has shown that the breadth of the lacrymal fossa varies with the shape of the skull, being wider in the brachycephalic and narrower in the dolichocephalic types. The lacrymal fossa is deepest at its base where it joins the naso-lacrymal canal, but Gérard has found that the canal is narrowest at the orbital opening, its lower end under the inferior turbinate body being wide and almost funnel-shaped. Moreover, the direction and inclination of the lacrymal passage is dependent upon the configuration of the facial skeleton, being influenced by the breadth of the bridge of the nose and of the nasal aperture, as also by the development of the maxillary sinuses. Testut showed that, seen in profile, the lacrymal fossa and canal slope gently backwards, forming an angle of 15 to 20 degrees with the frontal plane, while, viewed from in front, the fossa slopes outwards towards its lower end and the canal slopes inwards towards its nasal opening, together forming a curve the concavity of which is directed inwards, the summit being near the upper orifice of the canal—that is, the orbital opening. This lateral obliquity of the medial wall of the fossa is more marked in narrower noses. A narrow lacrymal fossa or an acutely curved lacrymal passage may more readily predispose to obstructive symptoms. The breadth of the nose and the width of the nasal passages were found to be distinctly narrow in only 13 cases (10.8 per cent.), and in only one of these was the epiphora bilateral. The intranasal prominence of the lacrymal groove was a distinct feature in all these cases. In 16 cases (13.3 per cent.) the nose and nasal passages were noted to be unusually wide, and the epiphora was bilateral in 6 cases. In none of the series was the size of the nasal passages dependent upon any deviation of the nasal septum.

Nasal Pressure Deformities and Reflex Neuroses.

Onodi considers that "the ostium of the nasal duct may be wholly or partially occluded by hypertrophy of the turbinates, by polypoid and papillary degeneration of the anterior end of the inferior turbinate, by foreign bodies, dental cysts, syphilitic and tuberculous lesions, etc." And

*A paper read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Edinburgh, July, 1927.

again, "Changes which take up space or exercise pressure, such as tumours, polypi, the so-called bone cysts, cystic swelling of the middle turbinate, mucous or purulent, spurs and deviations of the nasal septum, will have a like effect." Apart from actual obstruction in the lacrymal passages, Onodi further considers that "there may be a reflex neurosis set up which can evoke from the nose a reflex epiphora." Fischer, quoted by Onodi, describes the cure of a large lacrymal sac the size of a hen's egg following the resection of the anterior end of the inferior turbinate body.

It is difficult to realize how pressure from an enlarged turbinate bone, deviated septum, etc., can mechanically obstruct a membranous lacrymo-nasal tube, lodged as it is in a bony canal. Alterations in the width of the nasal passages following such lesions, which would kink the lacrymal canal, are a rarity. Stimulation of the nasal branches of the trigeminal nerve from nasal pressure deformities may reflexly excite excessive lacrymal secretion with resultant epiphora, but, without some obvious intranasal lesion which would mechanically obstruct the lacrymal passage, permanent distension of the lacrymal sac does not seem to me to be possible.

Enlarged and Displaced Middle Turbinates.—The middle turbinate was noted to be moderately enlarged in 12 cases (10 per cent.), occupying the space between the nasal septum and the outer nasal wall, but with no deflection of the nasal septum. In no instance was there massive cystic enlargement of the turbinate. Six of the series presented a distinctly oedematous appearance of the anterior end of the turbinate body. In two cases (not included in the above) the turbinate enlargement was on the side with no epiphora. The anatomical relation of the middle turbinate body to the lacrymal fossa is of interest, since Thorsch found that in a series of 79 specimens the middle turbinate in 52 instances lay completely behind the lacrymal groove. In four instances (3.3 per cent.) the middle turbinate was displaced outwards without any enlargement and not due to a deviated nasal septum. The peculiarity of these displaced turbinates is that the anterior tip of the lower border was distinctly curved outwards and pressing against the outer wall.

Deviated Nasal Septa.—In only 10 cases (8.3 per cent.) was the deflection of the nasal septum severe enough to displace the middle turbinate against the outer wall. The epiphora was in nine instances on the side of the septal deflection, while the tenth presented a bilateral epiphora which was worse on the side of the deflection. In 15 cases the septal deviation was too slight to have any bearing on the etiology, while in 7 cases the septum was deflected towards the side with no epiphora.

Inferior Turbinate Bone.—Considering the anatomical relationship of the inferior turbinate body to the nasal opening of the lacrymal duct it might be thought that lesions of the inferior turbinate would be frequently seen in cases of epiphora. There were, however, only two instances (1.6 per cent.) of moderate enlargement in the present series. It is, I believe, now generally accepted that the site of obstruction in the majority of cases is at the neck of the sac and not at the nasal orifice.

Rhinitis.—Atrophic rhinitis, usually a bilateral disease, was present in 7 patients (5.8 per cent.). The epiphora was bilateral in 4 and unilateral in 3 instances. Hypertrophic rhinitis occurred in 6 cases (5 per cent.), with bilateral epiphora in 3 patients, all boys, aged 9, 10, and 13 years, with marked hypertrophic rhinitis. Simple catarrhal rhinitis was only seen twice (1.6 per cent.).

Accessory Nasal Sinus Disease and Lacrymal Obstruction.

The lacrymal fossa in its upper half is related to the anterior ethmoidal cells, its lower half being related to the middle nasal meatus. According to Whitnall, in the majority of instances (54 per cent.) the anterior ethmoidal cells extend as far forwards as the anterior margin of the lacrymal groove and even into the frontal process of the superior maxilla. Less frequently the lacrymo-maxillary suture (32 per cent.) or the posterior margin of the lacrymal fossa (14 per cent.) forms the anterior boundary of the ethmoidal labyrinth. Pus arising from a suppurative ethmoiditis not infrequently spreads through the

lacrymal bone into the lacrymal groove and points externally at the inner canthus. A subacute or chronic inflammatory condition of the anterior ethmoidal cells may similarly extend through the lacrymal bone, producing a local periostitis in the lacrymal groove. The neck of the lacrymal sac may thus be constricted. Moreover, the close anastomosis existing between the venous and lymphatic plexuses of the ethmoidal, as also the maxillary, air sinuses and the mucous lining of the lacrymal drainage apparatus would appear to render the latter susceptible to obstructive lesions in inflammatory states of these sinuses. Ethmoiditis occurred eight times (6.6 per cent.) in the present series. There were two cases of closed empyema, four cases of cystic degeneration, and two of non-suppurative ethmoiditis with single polypi. There was no case of extensive suppurative ethmoiditis with multiple nasal polypi, nor was lacrymal obstruction found associated with an empyema of the maxillary sinus.

History of Nasal Disease.—A history of previous nasal trouble was a rarity, either spontaneously stated by the patient or admitted after interrogation. The majority of patients could give no explanation for the onset of the lacrymal obstruction and denied any knowledge of previous nasal trouble.

Table showing Incidence of Nasal Diseases, etc.
No. of cases examined 120.

Nasal Lesion.	No. of cases examined 120.	Percentage Incidence.
Injury	...	4.1
Breadth of nose and nasal passage—		
Narrow	...	10.8
Wide	...	13.3
Enlarged middle turbinate bones (moderate only)	...	10.0
Misplaced middle turbinates	...	3.3
Deviated nasal septum	...	8.3
Enlarged inferior turbinates	...	1.6
Rhinitis—		
Atrophic	...	5.8
Hypertrophic	...	5.0
Simple	...	1.6
Ethmoiditis—		
Closed empyema	...	1.6
Cystic	...	3.3
Non-suppurative with single polypi	...	1.6

Results of Intranasal Treatment.

To test further the etiological factor of such nasal abnormalities as were discovered, treatment for their relief was undertaken with the following results:

No relief of the epiphora or lacrymal sac distension followed non-operative treatment for the various types of rhinitis, except that in two cases of marked hypertrophic rhinitis some amelioration of the epiphora resulted from shrinkage of the inferior turbinate body induced by the electric cautery. In both of these cases the epiphora was very pronounced and the improvement would seem to follow the relief of the nasal pressure reflex.

The nasal septum was straightened, and where necessary the anterior end of the middle turbinate bone resected, in ten cases, but with no alteration in the epiphora.

No cure of the lacrymal obstruction followed ablation of a cystic ethmoidal labyrinth (four cases).

Complete recovery of the lacrymal obstruction followed drainage of pus in the two cases of closed ethmoidal empyema. The special interest of these two cases lies in the fact that there was no history of nasal purulent discharge, no free pus in the nose, and, in the first case encountered, the existence of pus was not suspected before operation. In each case the ethmoidal labyrinth had been converted into one large single pus sac.

Intranasal Drainage of the Lacrymal Sac (West's Operation).

This method of treatment, now so familiar, consists in the establishment of intranasal drainage of the lacrymal sac by removal of its inner nasal wall after thorough exposure through the nose.

Intranasal drainage was performed 45 times, with complete recovery in 32 (71.1 per cent.), moderate recovery in 5 (11.1 per cent.), and failure in 8 cases (17.7 per cent.). The term "moderate" is reserved for those cases with slight epiphora when out of doors, but in whom distension of the sac no longer exists; included also under this category are those who, when examined, present some

tears at the inner canthus though the patients are quite satisfied. No case is included in the above figures in which operation has been performed less than six months.

J. S. Fraser, who has had a large experience of this operation, gives 73.4 per cent. cures, and this, I think, is the experience of all those who have essayed the procedure on any large scale. The operation should not be attempted in the presence of acute dacryocystitis. External incision and drainage must first be established and the inflammatory condition allowed to settle down. A slit canaliculus does not preclude a perfect result.

Conclusion.

It would appear from the present investigation that the incidence of nasal abnormalities, deformities, and diseases, in cases of established lacrymal obstruction, is a rarity. The failure in relieving the lacrymal obstruction following the rectification of such nasal lesions as were found, with the exception of suppurative ethmoiditis, which is in itself rare, seems to preclude them as etiological factors in lacrymal obstruction. The absence of a history of nasal trouble in the majority of cases, as also the rarity of the incidence of nasal disease, would seem to render the nasal origin of lacrymal obstruction "non-proven." That there is a nasal cause would seem to be undoubted, but its exact pathology and incidence still needs further investigation.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

INTRATRACHEAL INJECTION OF LIPIODOL: GENERALIZED IODIDE ERUPTION: DEATH.

LIPIODOL consists of iodine dissolved in poppy oil, and gives a very dense shadow under x rays. It is considered a safe medium for injecting into the spinal canal, for intratracheal injection, and for injection into the uterine cavity and Fallopian tubes.¹ Its use has now become so widespread that any untoward effects have a general interest.

L. W., a commercial traveller, aged 40, had two attacks of pneumonia, the last in February, 1926. A nervous breakdown, with loss of memory, followed the removal of many teeth immediately after this last attack. In October, 1926, he was in a nursing home at Margate for chest trouble for three months. He was admitted to the London Hospital on March 6th, 1927, for a pustular and papular eruption, which had lasted since injections of antipneumococcal vaccines in 1926. The palms and soles had "peeled twice" since, and he had been taking an arsenical medicine regularly.

He was a grey-haired, worried-looking man, with a short, frequent cough and greenish morning expectoration. The pulse was 88 to 96 and regular; there was no fever; the urine was natural; the systolic blood pressure was 140 mm. of mercury; the chest was symmetrical and resonant to percussion, with a coarse "bronchitis rub" on the left side. Heart, abdomen, and central nervous system presented nothing abnormal. There were numerous scattered purulent follicles in the beard area, and small scattered pustules in the hair of the lower abdomen and pubic region. The skin of the whole body was dry and slightly rough. The nails were curved over a little at their tips.

On March 11th a physician reported: "Physical signs are suggestive of an old arrested fibrous lesion of slight extent at both apices, but more in the left than in the right. This seems to be borne out by radiological examination. Investigation by x rays after lipiodol injection would be useful."

The patient was seen by an aural specialist on March 14th on account of vertigo: no aural cause was seen; there was slight catarrhal otitis only. The septum and turbinates had been operated on in Germany.

On March 31st an injection of 20 c.cm. of lipiodol was given by the intratracheal route, and an x -ray plate of the lungs taken.

Laboratory investigations showed that the blood cholesterol was 100.4 mg. per cent. The Wassermann reaction was negative, and tubercle bacilli absent from the sputum (three investigations). Pus from an abscess of the abdominal wall yielded *Staphylococcus*

aureus. Blood culture (May 7th) was negative. Cultures of vesicles on forearms (May 3rd) were all sterile.

The temperature had been very irregular, and had risen to 101° by April 9th. On April 19th great numbers of small boils were appearing over the trunk and limbs. The voice was very hoarse and the cough more frequent and severe. On May 6th both forearms were covered with vesicles. Three days later the general condition was definitely worse; he was very weak, clear mentally, complaining of no pain, unable to cough with any force. He showed umbilicated drying vesicles all over the trunk, face, and limbs. On the legs many small scabs had come away, leaving raw granulating areas. Several who saw the patient during the last three days were suspicious of variola. No contact cases of variola developed. The vesicular fluid did not give any colour with starch paper. No iodides were found in the urine.

The patient died from bronchitis and heart failure on the evening of May 10th. No *post-mortem* examination was permitted.

During his stay in hospital the patient had been treated by epilation doses of x rays, barbitone for sleeplessness, varied by chloretone and local dressings.

This patient began to go downhill very definitely after the intratracheal injection of lipiodol. The eruption was one of the recognized types of rash that may follow the absorption of iodides.

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PALPABLE GALL STONES IN AN UNDISTENDED GALL BLADDER.

THE following case is of interest inasmuch as I have never before seen a case or heard one demonstrated where gall stones in an undistended gall bladder were palpable through the abdominal wall.

A man, aged 46, consulted me in May, 1927, for an attack of pain in the upper abdomen. It was not extreme nor definitely of a colicky type, but was described more as a soreness.

The patient gave a history of repeated attacks of similar pain at intervals during the previous five years. The first, in 1922, was accompanied by a rigor and by vomiting, but on subsequent occasions there had been no vomiting. The only physical sign present was tenderness on pressure in the epigastrium and in the right and left iliac fossae; nothing in the nature of a lump could be felt on his first visit.

On July 14th he again presented himself as he had another attack of pain. On examination a hard spherical lump, which seemed the size of a large marble, was felt some two inches below the tip of the ninth right costal cartilage; it could be pushed about freely within the radius of about two and a half inches, and pressure on it caused definite uneasiness.

In spite of the fact that the history was somewhat suggestive of cholelithiasis, or at any rate cholecystitis, I felt that the lump, by very reason of its ease of palpation, hardness, and mobility, could hardly be the gall bladder.

A barium meal having revealed no abnormality of the stomach or duodenum, laparotomy was advised to ascertain and deal with the cause of the repeated attacks of pain. The patient was admitted to Swansea General Hospital, where he was kept under observation for a week. On admission the presence of the lump was confirmed by Mr. C. L. Isaac and his house-surgeon, Mr. A. H. Holmes. Three days later it could not be found, but two days subsequently it was again felt in its original position and of its original size, hardness, and mobility.

Laparotomy was performed on July 25th by Mr. C. L. Isaac, who, on opening the abdomen, immediately found and demonstrated the gall bladder, undistended, not obviously inflamed, freely movable, and full of stones. Cholecystectomy was performed and the patient made a good convalescence.

Although of lean build, the patient was not wasted and his abdominal muscles were quite well developed.

Swansea.

F. H. KINGSTON KNIGHT.

HEREDITARY DEFORMITY OF THE FINGERS.

THE recently reported case of this condition prompts me to record one somewhat similar with which I came in contact a few weeks ago. In my case the feature on which I wish to lay stress is the fact that the deformity has been transmitted through both male and female members of the family; it also differs anatomically from that already published.

A girl, aged 6 years, said by the mother to be a 6½ months' child, exhibited the following deformity. Each finger consisted of only two phalanges, the proximal ones being of average length, but the distal shorter than the normal. The latter had rudimentary nails, which did not extend to the ends of the fingers. The thumbs had each only one phalanx bearing a shortened nail similar to the fingers. The child's feet showed no abnormality, though her sister, aged 10, had slight webbing of the toes. One of her brothers, aged 14, had no nails on the second and third digits; an adult brother with this deformity suffered little or no disability in earning his livelihood as a labourer.

¹ Vilandre, G.: "Diagnostic use of Lipiodol," *London Hospital Gazette*, 1927, xxx, No. 4, p. 86.