NOTE.—Since this article has been in the press several replies have been received from patients in various parts of the world, all of which show the operation to have been successful up to date. To the stated period since operation five months must be added in every case.

ACUTE NECROSIS OF SKIN.

By CAREY COOMBS, M.D. LOND.,
CASTLE CARY.

IN the following remarkable case the persistence of high temperature, the appearance and progress of the sore, and the fact that the first nurse had to leave because her hands became infected suggest a bacterial cause. Syphilis may be dismissed, and tuberculosis is improbable, as the patient and her children had never shown any tendency of the kind.

History of the Case.

A stout lady of yellowish complexion began to suffer from remittent fever on April 10th, 1907. There was much pain in the course of both sciatic nerves, followed after a few days by the appearance of three or four bullae, like those of ecthyma, about $\frac{3}{4}$ in. in diameter, near the tuber ischii. These bullae formed sores which healed in three months. On the inside of the right knee one bulla appeared about May 11th, $\frac{1}{2}$ in. in diameter; nine days later it was $\frac{3}{4}$ in. in diameter. Its margin was purplish-red, raised $\frac{1}{2}$ in. above the surface of the sore, which consisted of healthy granulations. In two months the whole thickness of the true skin had gone from the right leg; the limits in the front of the foot were the bases of the toes, on the sides of the foot the points of the malleoli, the upper edge being on the level of the patella. The tendon of the extensor of the toes was exposed on the dorsum of the foot. On some days more than a square inch of skin died. The process usually began by serum appearing under the epidermis at the growing point of the necrotic area; the cutis vera died in a few hours; when it was cut off, granulations were found growing beneath.

The necrosis ceased at the end of July—that is, in the tenth week—and the whole surface had skinned over in November, 1908, eighteen months after the disease started.

As a rule, the edge of the wound was well defined, purplish-red; the surface generally was clean, and islands of new skin appeared from time to time. Skin-grafts generally grew readily. But in March, 1909, the skin began to die again on the inner side of the calf, and in six weeks the surface of the sore was $\frac{3}{4}$ in. in diameter. The patient's temperature was above 99° at night for twenty-five weeks, the highest point being 104° . The discharge from the sore was not examined until the recurrence took place in 1909.

There can be no doubt that the patient's excellent appetite helped her recovery. The recurrence has followed four months of lack of nourishment, as her food began to return daily soon after she started a laryngeal cough. Her veins were weakened by her pregnancies, and venous bleeding has three times followed lowering the leg to the floor. Bier's bandage had the result that great pain and large blebs of blood appeared in two minutes after it was applied. The whole limb became oedematous, just as the sore was nearly healed.

Treatment.

Quinine and iron were taken throughout the illness. Opium was given at night, and was added to the ointment used for about a year—namely, lanoline containing tincture of benzoin and opium, suggested by Dr. Milner Moore. At first boric acid was used in carbolic lotion, $2\frac{1}{2}$ per cent. Then, by the advice of Dr. Firth, of Bristol, iodoform was added to the lotion, and the edges of the wound were painted with hydrogen peroxide. These methods were continued during the time of rapid sloughing—ten weeks. When the skin began to die again, in March, 1909, I ionized the sore by placing the positive electrode of a Leclanché battery over layers of lint soaked in 2 per cent. zinc sulphate solution on the sore; 10 to 12 milliamperes of current were used for ten minutes every two or three days. The result was to make the surface look silvery white, as though mild silver nitrate had been applied. But the use of hydrogen peroxide and iodoform lotion had a better effect, and at the end of six weeks the recurring ulceration is arrested. One ulcer, $2\frac{1}{2}$ in. in diameter, is closing, and seven, which are about half an inch across, are stationary.

THE Edinburgh Post-Graduate Course, which commences on August 30th and extends for four weeks from that date, promises, judging from the number of entries, to be at least as popular as its predecessors. The full number of applications for the Special Surgical Course, the attendance on which is limited to twenty-five, were indeed received almost a month prior to the date of its commencement, and some of the limited classes of the General Course, which is, as in former years, divided into two quite independent fortnights, are filling up rapidly. Among those who have entered are several who have taken out the Course in previous years.

Three Demonstrations

ON

CONGENITAL MALFORMATIONS OF PALATE, FACE, AND NECK.

GIVEN AT THE ROYAL COLLEGE OF SURGEONS, ENGLAND.

BY

PROFESSOR ARTHUR KEITH, M.D., F.R.C.S. ENG.,
CONSERVATOR OF THE MUSEUM.

II.—CONGENITAL FISTULAE OF THE LOWER LIP.

A BILATERAL cleft in the upper lip is frequently associated with a curious malformation of the lower lip, in which two fistulae or recesses open on the lower labial surface opposite the clefts in the upper lip. The orifice of each recess may be raised into a nipple-like process, which, when the mouth is shut, fits into the corresponding upper cleft. This was the condition in a specimen submitted to me by Mr. Woolcombe,¹ which was excised from the lip of a boy, aged 3 months. The orifice of the recess was situated at the apex of the papilla; its fundus, about the size of a rice-grain, lay within the substance of the lip, and was surrounded by mucous glands which opened into it. A layer of striated muscle surrounded the pocket, which in nature was clearly a localized invagination of the mucous membrane and glands of the lip. In three cases reported recently by Mr. R. C. Dunn,² there was one in which the recesses opened on nipple-like processes; another in which the orifices were wide and flush with the surface of the lip; while in the third the two recesses were confluent—thus forming a transverse depression on the surface of the lower lip. The condition has been described by Mr. Bland-Sutton, Mr. Arbuthnot Lane, Mr. Clutton, and Dr. Ballantyne. There is no example of this malformation in London museums. An appeal to comparative anatomy does not afford a satisfactory explanation. Seeing that the malformation is so closely associated with bilateral harelip and cleft palate, a condition which occurs normally in certain fishes, it is clearly in this vertebrate class that an explanation of the condition is to be sought. On each side of the middle line of the lower lip of sharks, and exactly in the position where these recesses are found, open a group of mucous canals which are connected with nerve endings found in fishes. It is possible that these labial recesses have some relationship with these two mucous labial organs found in selachians, but the matter requires further investigation.

TABLE II.

	A.	B.	C.*	Total.
Recesses and papillae on the lower lip ...	—	—	—	—
Median clefts on the lower lip and mandible	—	1	3	4
Naso-maxillary cleft	—	4	—	4
Lateral nasal clefts... ..	3	1	—	4
Mesial nasal clefts	—	—	5	5
Lateral nasal proboscis	—	—	—	—
Recess on nasal septum	—	—	—	—
Congenital perforation of nasal septum ...	1	—	—	1
Occlusion of anterior nares	2	—	—	2
Occlusion of posterior nares	—	—	—	—

* For explanation see Table III.

Median Cleft of the Lower Lip and Mandible.

Among the 250 specimens of malformation examined, only 4 showed this condition—a full-time child in the museum of St. George's Hospital and three specimens in the museum of this college, one from an ass, another from a cockatoo, and a third from a sparrow. Seeing that the lower lip and mandible arise by the fusion of right and

left halves, their immunity from median fissure, as compared with the upper lip and palate, is surprising. In four other specimens there was an apparent cleft of the lower jaw, but when the condition was more minutely examined it was seen that the lesion was really the result of a bifurcation or doubling of the buccal cavity, an attempt at the formation of twins.

Naso-maxillary Clefts.

In four fetuses, all of them nearly at full time, the maxillary process is widely separated from the lateral nasal process, so that the nasal duct is represented by a wide groove, lined by mucous membrane, and shelving from the inner angle of the eye into the nasal cavity (Fig. 9). These specimens are in the museums attached to the medical schools of St. Bartholomew's, St. Thomas's, and the "London" Hospitals. In two the cleft is on the right side and in two on the left. The nasal duct and lacrymal canaliculi are formed at the same period of development as the primitive palate—namely, during the sixth and seventh weeks, when the maxillary and lateral nasal processes fuse across the intervening groove and enclose a rod of solid epithelium between them. The rod becomes canalized early, but, according to Stanguleanu,³ its nasal end does not open until the end of the eighth month. In all four specimens there was double harelip and cleft palate. In the specimen figured the cleft had evidently been continued into the temporal region on the right side, a small half-submerged polypus marking its termination on the right temple. The nasal duct appeared during the evolution of the amphibia, but in no living animal is any stage known between the complete formation of the duct as seen in amphibia, and the open skin area between the nose and eye as seen in sharks. There are no specimens in the metropolitan museums which illustrate the occurrence of dermoid cysts along the naso-maxillary fissure. Ballantyne met only three specimens of fissure in the cheek in 325 cases of congenital malformation.

Lateral Nasal Clefts.

Through the courtesy of Mr. Raymond Johnson I was lately afforded an opportunity of examining a child which showed a very uncommon and very interesting malformation of the nose (Fig. 10). There was a complete cleft of the palate, the cleft ending anteriorly in the left nostril. The wing of the left nostril (lateral nasal process) is pulled outwards and is widely separated from the septal part of the nose (the mesial nasal process). The cleft thus lies between the mesial and lateral nasal processes on the left side. On the forehead there is an interfrontal depression covered by hair which descends towards the nasal cleft. There is no specimen exactly like this in the metropolitan museums, but there are four—three of them in the museum of this college—which help us to understand the condition. It is one due not to an arrest of the normal progress of development, but to certain bands, probably amniotic in origin, which are apt to occur in certain pathological conditions of development between the anterior nares or lips and the scalp. Professor von Winkel,⁴ who regards most facial malformations as a result of amniotic adhesions, has figured a case in

which such a band passed from each nostril over the forehead to end in spongy tissue on the scalp. In two specimens in the college collection the scalp and calvarium are represented by a spongy vascular mass of tissue; a deep furrow passes from this mass along the nose to a premaxillary cleft on the left side of the

palate (see Fig. 11). The left ala of the nose bounds one side of the fissure in which the left nasal cavity is exposed. The right anterior naris is perfectly formed, for the furrow, as in Mr. Raymond Johnson's case, lies between the mesial and lateral nasal processes of the left side. In another specimen in the college collection epidermal filaments—adhesive cords, such as are regarded as amniotic bands—project from and close the nostrils, but the face is otherwise well formed. In a specimen of anencephalic fetus in the museum of University College Hospital Medical School the nostrils are small and closed; from the root of the nose bands of tissue, apparently amniotic in origin, are attached. Taking all these cases together, one may reasonably infer that in Mr. Raymond Johnson's case (Fig. 10) an abnormal band of epidermal or amniotic tissue had been formed at an early stage of development between the coverings

of the cerebrum and buccal cavity, the depression in the forehead indicating the position of the band. Why bands should be formed so exactly in the same position in case after case requires further elucidation. We shall see presently that fissures of a similar nature occur between the mouth and the ear.

Mesial Nasal Fissures.

There is not a single museum specimen in London to illustrate the occurrence of a fissure in the mid line of the nose in the human subject, nor is there a specimen of the dermoids or of the fistulae which occasionally occur in the line of this fissure. Dr. Alex. MacLennan⁵ has recently reported a case in which a tumour, dermoid in nature, occupied an area corresponding to the flat, wide inter-olfactory field of the human embryo and of the shark, and had prevented the proper apposition and fusion of the symmetrical right and left halves of the nose. An incomplete fusion in the mid line of the two halves of the external nose is comparatively common amongst animals; five specimens in the college museum illustrate the condition—three from the pig, one from the cat, and one from the dog. Mr. Bland-Sutton has drawn attention to a breed of Parisian pug dogs in which a mesial nasal fissure forms a constant feature.

Lateral Nasal Proboscis.

In certain rare cases one half of the nose is arrested at an early stage of development and assumes the form of a small proboscis, such as is shown in Fig. 12. Some eight years ago Mr. Frederic Eve gave me the opportunity of examining a boy at the London Hospital in which this abnormality was present, the proboscis being situated over the inner canthus of the right eye in place of over the left canthus, as in Fig. 10. In many specimens of cyclops the nose is represented by such a proboscis (see Fig. 15); a lateral nasal proboscis represents a half—right or left as the case may be—of the proboscis seen in a cyclops. Mr. Eve removed

Fig. 9.—Full-time child, showing tripartite palate and naso-maxillary cleft. A, Polypus in temporal region, probably connected with a naso-maxillary cleft; B, C, right and left lateral nasal processes; D, mesial nasal process; E, F, right and left alveolar maxillary processes.

Fig. 10.—Child showing nasal cleft with depression on forehead (Mr. Raymond Johnson's case). A, Ala of left nostril; B, ala of right; C, sacs of incisor teeth; D, mesial, nasal, and right maxillary elements; E, left maxillary element; F, depression on forehead marked by prolongation of scalp.

the proboscis, and it was found to consist of a central pocket of mucous membrane, encapsuled in a thin plate of cartilage and covered by skin. Mucous fluid escaped from it, as in Kirchmayer's case, when the boy cried. The epithelial lining of the mucous pocket is stratified squamous at the trumpet-shaped entrance, and columnar in the rest of its extent. The primary lesion in these cases appears to be a unilateral absence or failure of the epithelial and nervous substratum of the organ of smell; the stimulus which gives rise to the full formation of the nasal cavity is apparently derived from the normally developed olfactory epithelium and olfactory bulb. The same thing is seen in connexion with the ear; when the eighth nerve is absent the external ear is malformed or absent. The case recorded by Kirchmayer⁶ differs from all others: he regards the fold crossing the cleft in the lip (see Fig. 12) as the ala nasi of the left side, and the proboscis as a supernumerary structure, which therefore does not represent the left half of the nose. In all other cases the proboscis was the sole representative of the corresponding half of the nose, and it is possible that this is also the condition in Kirchmayer's case. The isolated development of half of the nose as a proboscis does not give rise to a gap or fissure on the face; the maxillary process fuses with the nasal processes of the opposite side (see Fig. 12), thus covering the area normally occupied by the missing half of the nose.

Malformations of the Nasal Cavity.

In Fig. 13 is shown the preparation (No. E 169 in the college collection) of a nose of a newly-born child prepared by Mr. Shattock to show the normal development of the little mucus pocket which represents Jacobson's organ at birth. The pocket contains a small isolated area of the olfactory epithelium vestigial in man, placed on the septum near the anterior nares and the naso-palatine canals. Indeed, in many mammals the orifice of the pocket appears on the palate by the side of the incisive papilla, and is probably stimulated by the odour arising from food as it enters the mouth. Occasionally the septal pocket or recess assumes a considerable size. Mr. Hunter

corresponding pocket situated on the right side of the septum. Ballantyne gives reference to several cases. I need only mention certain other malformations of the nasal cavity. A specimen in the Hunterian Collection of

Fig. 11.—Full time child showing a cleft in nose, probably caused by an amniotic band. A, Right nostril; B, ala of left nose, bounding left side of a fissure which leads up to the masses of tissue E, F; C, the arrow points to the left nostril; D, left eye. A condition of exomphalos was also present.

the region of the posterior nares is filled with a solid mass of epithelium in its earlier stages of development; in a later stage, the epithelium breaks down and the nasal cavities then communicate with the nasopharynx. In some cases the occluding tissue contains bone. The conditions require further examination. Occlusion may occur at the anterior nares. There are two cases in the college collection. The anterior nares are represented by pits, which, as regards depth, correspond to the wings of the nose. Retzius observed that an occlusion of the anterior nares by an epithelial plug occurred during the 3rd, 4th, and 5th months of fetal development. Occlusion of the anterior nares is evidently due to an organization of this plug.

Fig. 12.—Lateral nasal proboscis (after Kirchmayer).

CYCLOPIA.

Although this condition is altogether beyond surgical aid, it is well worthy of study were it only to illustrate the extraordinary manner in

TABLE III.—List of Specimens showing the Conditions of Cyclopia and Agnathia.

	A.	B.	C.	Total.
Cyclopia with the nasal processes fused to form a proboscis	6	5	17	28
Cyclopia without a proboscis	—	4	6	10
Cyclopia combined with agnathia	6	—	12	18
Agnathia (ears lateral)	1	1	4	6
Agnathia (ears ventral)	1	3	13	17
Aprosopus (absence of the preauricular part of the face and head)	2	1	8	11
	16	14	60	90
Epignathus	2	5	4	11
Buccal fissures	2	2	2	6
	4	7	6	17

Fig. 13.—Septum of the nose, showing septal recess (Jacobson's organ), in full-time child (Mr. Shattock). A, Septal recess with glass rod inserted at orifice; B, naso-palatine canal; C, middle turbinate process; D, vomer.

Tod showed me such a case in his out-patients at the London Hospital. Mangakis has figured a case in which a pocket passed along the posterior three-fourths of the nasal septum on the left side, its orifice communicating by a perforation in the septum with the orifice of the

A. Human specimens in the Museum of the Royal College of Surgeons of England.

B. Human specimens in the museums of the metropolitan medical schools.

C. Specimens of vertebrate animals others than man chiefly in the Museum of the Royal College of Surgeons.

which the embryological elements of the face can adapt themselves to an altogether new combination, and produce a structure which is at once malformed and yet finished. Table III shows the great wealth of material which has been collected to illustrate the condition; the table also shows the groups into which I have arranged the material at my disposal, but it would

Fig. 14.—Head of fetus, showing cyclopia combined with agnathia. A, Proboscis-like mouth; B, external auditory meatus; C, combined eyeballs; D, right ear, showing two fistulae.

require a series of demonstrations to deal with the various conditions fully. Figs. 14, 15, 16, and 17 will serve to give a general idea of the lesions represented in the various groups of cases included in Table III. Fig. 14 represents a specimen in which the nasal cavities and all the parts pertaining to the nasal cavities are absent, so that the orbits and eyelids and eyeballs fuse in the middle line of the face. There is no apparent trace of the nasal processes

Fig. 15.—Mesial section of head of cyclops. A, Frontal bone in forehead; B, proboscis with capsule of cartilage forming inner wall of cavity; C, fused eyeballs; D, superior maxilla; E, fused anterior ends of cerebral vesicles; F, fused optic nerves; G, Eustachian tube opening in naso-pharynx; H, palate bone.

of development, and yet the maxillary processes have escaped and attempted to cover up the deficiency. In Fig. 15 is shown a section of the head of a cyclops child (No. 223, R. C. S. Museum) in which the mandible is fully developed, and the nasal processes are represented by a proboscis projecting over the median eye. The *basis cranii* in front of the pituitary body is absent, only that part of the skull base is present which is

developed in connexion with the primitive body axis, the notochord. The optic foramina and sphenoidal fissures form one opening. The optic nerves are fused, and in

Fig. 16.—Facial part of the skull in a cyclops. A, Orbital plate of frontal; B, foramen for combined optic nerves between small wings of sphenoid; C, great wings of sphenoid; C', basi-sphenoid; D, malar; E, orbital process of palate bone; F, annulus tympanicus; G, superior maxilla.

such cases Mr. Stephen Mayou⁹ found no nerve fibres developed within them. The olfactory lobes and nerves are absent, and the proboscis is made up of the cartilagi-

Fig. 17.—Palate in a case of cyclops. C, Socket for canine tooth; M¹, M², for first and second milk molars; A, palatal plate of maxilla; B, horizontal plate of palate; C, vertical plate of palate; D, external pterygoid plate.

nous olfactory sense capsules, which enclose a pocket of mucous membrane representing the fused olfactory pits. We are dealing here with an atrophy of all those

Fig. 18.—Head of full-time child, showing the condition of agnathia. A, Lips and mouth; B, buccal cavity (stomodaeum) exposed from below; C, fibro-muscular mass representing muscles of the lower jaw; D, external auditory meatus; E, mylo-hyoids, with tonsils and tongue lying deep to them; F, hyoid; G, bar of bone representing zygomatic process.

parts pertaining to the prechordal part of the skull, a part which we have reason to believe is of less antiquity than the chordal part. Fig. 16 shows the

formation of the single orbit. All the membrane-formed bones, developed in connexion with the cranial cavity and with the maxillary processes, are present, but the bones formed in connexion with the nasal processes are absent. The orbital plates of the superior maxillae and palate bones meet to form a complete and finished floor for the orbit. Although the pre-maxillary element is absent, the palate is neatly formed, and carries no incisor teeth, only the canine and milk molars (see Fig. 17). The position of the posterior nares is occupied by the vertical plates of the palate bone, which meet in the middle line, there being of course no vomer and no septum. As may be seen from Fig. 15, the naso-pharynx is formed and receives the Eustachian tubes.

AGNATHIA.

The condition of parts in agnathia are shown in Fig. 18. There is, in this case, a total separation of two embryological parts—the stomodaeum or primitive mouth and the pharynx (developed from the foregut), which normally become continuous before the end of the third week of development. In the figure the cavity of the stomodaeum is exposed from below, and shows the palate in a complete form on the roof of that cavity. There is no trace of the lower jaw, but a mass of fibro-muscular tissue represents its musculature. The lobules of the ears and the tympanic rings are fused on the basal surface of the skull; the malar bones and zygomatic processes occupy a position in the ventral aspect of the skull. The auditory passages open into the pharynx, which contains the tongue. The tonsils lie just above the hyoid bone (see Fig. 18), and over the mylo-hyoid and hyo-glossus muscles.

In the conditions just described the nasal or the mandibular elements of the face may be absent, or both may be wanting, but in the last group given in Table III—the condition known as "aprosopus"—the maxillary as well as the two other elements are absent, and the animal appears to terminate in a pharynx and ears.

EPIGNATHUS.

The illustration I give to represent this condition is taken from the paper on epignathus by Dr. Alex. Low,¹⁰ in which the fullest and most accurate account of this condition is given. The specimen in the college collection, the two at St. Bartholomew's Hospital, and another at St. George's Hospital, are replicas of the specimen described by Dr. Low. Two others, one in St. Mary's Hospital and another at Guy's Hospital, differ in that the tumour, instead of projecting through the widely opened mouth, protrudes on a distorted face. The epignath may form quite a small tumour, such as represented by the specimen recently presented to the college collection (No. 5413) by Mr. Bland-Sutton. The condition is also represented in the college collection by two examples from the pig and two from kittens. The epignathous tumour mass represents a twin embryo, which, owing to the position and condition of the development, has to derive its blood supply from the head of the host fetus. The stalk

of the tumour is attached to the base of the skull of the host fetus in the region of the basi-sphenoid—the region where the notochord, or primitive axis, ends (Fig. 19). When the face is developed the attachment of the epignathial twin becomes included in the septum of the nose and palate. The size and differentiation of such tumour masses vary widely. Fuller information regarding the nature of epignathous tumour will be found in Principal Windle's paper.¹¹

Fig. 19.—Dr. Alex. Low's case of epignathus. A, Nasal septum; B, nose, upper lip, and palate; C, tongue and lower lip; D, the basi-sphenoid.

Fig. 20.—Head of human fetus showing a mandibular cleft, absence of the parts developed from the mesial nasal process and eye deformity of the external ear. A, Maxillary process; B, eyeball; C, external auditory meatus; D, mandible; E, auricular appendix.

now in the college collection, are usually supposed to represent an imperfect fusion of the mandibular and maxillary elements of the face. I am disposed to think—and the evidence on which I base my inference will be given more fully when I come to deal with supernumerary auricles—that these clefts represent not an arrest of fusion of normal elements, but fissures caused by bands which are supposed to be amniotic in origin and are apt to be formed, during morbid conditions of development, between exposed mucous surfaces such as the lips and ear, lips and eye, nares and exposed meninges. A true condition of macrostomia—of persistence of the fissure between the mandibular and maxillary processes in the human subject—is shown in Fig. 20. The external auditory meatus is present, but the external ear is represented merely by a cutaneous tag below that orifice. The orifice of the mouth extends almost to the meatus. The maxillary processes, owing to an arrest in their growth, have met internal to the orbits, thus leaving the eyeballs on the upper border of the buccal cleft. I have seen this condition in four specimens, two of them being human fetuses, and the other two malformed lambs.

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THE Third International Congress of School Hygiene will be held in Paris in Easter week (March 29th to April 2nd), 1910. Committees have been formed in all civilized countries, and these countries will be represented by delegates. All communications relative to the congress should be addressed to the General Secretary, Dr. Dufestel, 10, Boulevard Magenta, Paris.