

served between the crura. In 6 of the cases, which had not been dizzy before, vertigo, more or less severe, followed the operation, persisting for more than a month in 3 of them, in 1 for nearly a year, and in but 3 out of the 21 cases was there improvement in hearing, except temporarily.*

As an example of the feasibility of operation upon the middle ear through the exploratory tympanotomy opening, the following case, that of a woman fifty-five years of age, in whom the operation included the removal not only of the stapes, but also of the incus, may be cited. At the time of operation, there was marked decrease in hearing in both ears in consequence of chronic, non-suppurative disease of long standing, and in the right ear neither Politzer's acoumeter, nor the tuning-fork, nor the upper portion of the scale of the Galton's whistle was heard. Subsequently to the injection of a two-per-cent. solution of cocaine through the Eustachian catheter, the crescentic, peripheral cut in the right drumhead was made with but one application of cocaine solution to the edges of the cut and with but little discomfort to the patient. Tests of hearing at the end of the first stage of the operation showed no improvement either by aerial or by bone conduction, and served to confirm the diagnosis of fixation of the stapes in consequence of the long-continued thickening process in the middle ear. Careful tactile examination of the accessible portions of the inner tympanic wall, especially in the neighborhood of the fenestral niche, by means of a probe, showed lack of sensitiveness to touch, with the exception, perhaps, of a slight pricking sensation; if, however, the probe came accidentally or intentionally into contact with the cut edges of the drumhead, especially upon the superior posterior margin, there was a sense of discomfort, which amounted to pain as the effect of the cocaine passed off, which it apparently did before the more important part of the operation was concluded; care was therefore taken in subsequent manipulation to avoid touching the edges of the opening. Under these conditions the operation, including tenotomy of the stapedius muscle, disarticulation and removal of the stapes, was continued and completed without pain. The division of the tendon caused to the patient the sensation of a dull thud, and in dividing the articulation between the incus and stapes the grating sound made by the knife was similarly heard. The ankylosis at this point was very firm, and disarticulation was effected with such difficulty that at its completion the incus dropped not only outward, but also slightly downward, in such a manner as to show that it was separated from the malleus also; its removal, therefore, seemed advisable, and this was easily done by means of the blunt hook and forceps, the only pain caused being incident to the passage of the body of the incus through the opening in the drumhead. The stapes was now plainly in view, and as no improvement in hearing had thus far been effected, this bone also was extracted, by means of a blunt hook passed between the crura from above, and came away with a sensation, to the patient, of a loud report, but without causing either pain or vertigo; the pulse, which had been 80, rose to 100 and became weaker, but returned to its former rate and volume within two minutes. Subsequently to the operation there was no other discomfort than that naturally incident to having the head held for a long time in a constrained position, and in this respect, as well as in the conditions of the operation itself, the result was a satisfactory one, although the hearing was not materially improved.

In a man twenty-nine years of age the hearing in both ears had become impaired, and in the left ear gravely

* In a case of destruction of the drumhead and loss of the malleus and incus incident to suppurative disease in childhood, there had been no cicatrization. The mucous membrane of the tympanum was clear, dry, and transparent; the stapes was plainly visible in the niche, but without attachment of the stapedius muscle. For hearing purposes this ear (the right) was practically useless. Removal of the stapes, which came away easily with a slight sense of suction, was followed by an outflow of fluid and immediate increase of hearing (the voice being heard twenty feet) and a severe vertigo; the hearing and vertigo lasted ten days, and then both disappeared.

affected, as the result of a chronic non-suppurative disease of the middle ear. The Politzer acoumeter was heard only when held, so close to the ear that the hammer was on a line with the posterior border of the concha; the tuning-fork (512 v. s.) was heard aerially $\frac{3}{8}$, and by bone conduction $\frac{3}{8}$; Politzer's forks, Nos. 1 and 2, were not heard aerially, nor was a Galton's whistle, ranging from 6,000 v. s. to 12,000 v. s.

After the first stage the operation was painless, except when the shaft of the instrument touched the cut edges of the drumhead, but it was accompanied by the auditory sensations incident to tenotomy and disarticulation.

Efforts at mobilization showed the stapes to be firmly fixed, and in an attempt at circumcision by means of a fine paracentesis needle, the knife met with bony resistance on the superior and posterior borders of the niche, and gentle traction, made with a blunt hook, resulted in the coming away of the head and both crura of the stapes broken off close to the foot plate. There was no sense of suction on this extraction, no vertigo, no change in pulse, and no special sensations to the patient, except a snapping noise which was presumably heard at the moment of fracture. Investigation of the fenestral niche by means of a probe showed the base plate to be apparently fixed by bony union, especially to the posterior and superior niche walls; subsequent examination of the crura showed them to be distinctly atrophied, as is the case in long-continued ankylosis of the base plate of the stapes. The whole operation, including the tests of hearing made during its progress, lasted but twelve minutes and was without pain to the patient, who was, however, it should be said, a well man of an equable temperament. Five days after the operation, during which interval there had been neither pain nor other discomfort, the hearing test gave the same result for Politzer's acoumeter and for duration of the tuning-fork aerially; but the hearing was improved in the following respects: Galton's whistle, previously not heard at all, was now heard throughout its whole register; the tuning-forks, Nos. 1 and 2, were heard plainly, as was also the voice in a low tone, close to the ear; a loud voice, however, even if one or more feet distant, was heard only confusedly.

Clarence John Blake.

EAR DISEASES: SYPHILITIC AFFECTIONS.—I.

ACQUIRED SYPHILIS—AURICLE.—*Primary syphilitic chancres* have been but very seldom seen on the auricle and the adjacent parts. Desprès¹ found among twelve hundred syphilitic patients one with a chancre (soft) on the auricle. Pellizzari² reports having seen a primary sore on the lobule, and thinks that it was caused by the use of a towel which the son of this patient had previously used in cleaning a sore on his penis. Hermet³ saw a chancre on the lobule of a woman's ear, which resulted from a kiss by her infected husband. The same author⁴ saw also, in the clinic of Dr. Fournier in Paris, a phagedenic hard chancre on the lobe and the posterior part of the lower third of the auricle, caused by the bite from an infected individual. A similar case, due to a bite, has been observed also by Hutchinson.⁵ Hulot⁶ saw a chancre on the base of the tragus, the origin of which was problematical. Zucker⁷ has described at length the history of a case of chancre on the outer surface of the tragus. A chancre on the mastoid process in a man, due to the kiss of a prostitute, has been observed by Mracek,⁸ and another in the same place in a child, caused by infection from the nurse, has been described by Hulot.⁹ Finally, Lincke,⁹ speaking of otitis syphilitica externa, says that it attacks sometimes the auricle, at other times the external canal, or it may attack both parts simultaneously, and that it manifests itself usually in the form of a chancre.

As far as can be seen from the description of the cases here cited, the chancres presented the usual appearance; the lymphatic glands in the vicinity were enlarged and indurated. In Zucker's case the tragus was of a livid red color, of twice the normal thickness, and on its anterior surface was a pigmented radiating cicatrix. The

entire parotid region was involved in the process; it was greatly swollen, felt as hard as a board, but was not at all painful. There was no secretion from the external canal, and the hearing was but slightly diminished in acuteness. In this case the diagnosis of primary syphilitic infection was facilitated by the recent appearance, on the surface of each hand, of three or four small, round, slightly scaly efflorescences. The genitals were intact, and the inguinal glands were not swollen. A course of inunctions produced a perfect and rapid cure.

A primary sore on the auricle may be mistaken for cancer, from which it differs, however, in that it presents a clean surface and secretes but little. The nearest lymphatic glands usually enlarge with the development of induration in the primary sore.

Secondary and Tertiary Forms.—Manifestations of constitutional syphilis are not very rarely observed in the auricle. Squamous, pustular, and papular eruptions, usually in connection with the same affection on the integument of adjacent parts, but sometimes limited to the auricle and external canal, have been seen by many writers. According to Gruber,¹⁰ papular eruptions are most frequently seated at the point of insertion of the auricle, while exanthematous eruptions appear mostly on the other parts of the auricle. Broad condylomata have been often seen by Desprès on the lobule, and usually in the hole for the earring. Wilde,¹¹ as far as I know, is the only author who maintains that syphilitic ulceration is by no means uncommon, and that rupia is frequently seated on the external ear.

Tubercular syphilides* and gummata of the auricle have been observed by Zeissl,¹² Burnett,¹³ Buck,¹⁴ Field,¹⁵ Hessler,¹⁶ Pelletan,¹⁷ Sexton,¹⁸ Pierce,¹⁹ Ravogli,²⁰ Woakes,²¹ Barklay,²² Bumstead and Taylor,²³ McBride,²⁴ and Packard.²⁵ In all of the cases reported, the affections appeared in the so-called tertiary stage of syphilis. In almost all only one ear was affected, and in the majority of the cases no other symptom of syphilis was present at the time the patient came under observation. The seat of the tubercle or gumma was in the anterior part of the auricle in all the cases, except Burnett's, in which it occupied the posterior surface. A case with symmetrical patches of lupus erythematosus in the concha of each ear, probably syphilitic, was seen by Hutchinson (*loc. cit.*, p. 348). According to Zeissl, the auricle may be the seat of both the dry (non-ulcerating) and the ulcerating forms of gummata, and the latter frequently shows a tendency to the lupoid character in this situation (Fournier). In Burnett's case, which is about the only one recorded in which the disease was seen in its earliest stages, there first appeared a circumscribed infiltrated lump on the posterior surface of the auricle, and this gradually extended until it had diffused itself throughout the tissue of the pinna. It was slightly elevated above the general surface of the auricle, of a deep reddish color, painless, and was not attended with itching; it was inclined to run a slow course. In the space of a month or six weeks the infiltration had diffused itself throughout the greater part of the auricle, and somewhat over the mastoid portion. The thickening and deformity of the auricle had become considerable, the groove behind the auricle was obliterated, and the appendages assumed a firm, thick feeling. This condition lasted for some weeks, then softening and ulceration ensued, the latter beginning in some natural groove or depression. The ulcer thus formed by the breaking down

* The tubercular syphilide is a solid rounded nodule of the skin and subcutaneous cellular tissue, and is coppery or purple-brown in color; commonly several tubercles are collected in a group. The tubercle is liable to ulcerate, and its course is slow. Sometimes creeping ulceration attacks a tubercle. When this takes place, little tubercles develop at the margin of the first deposit and merge into each other. The original tubercle soon ulcerates; a scab is formed, under which the ulcer creeps, healing where the tubercle first began to melt away, and spreading by the destruction of the tubercles at the margin of the ulcer. The course of the affection is indefinite, unless controlled by treatment. Ulcerated tubercles always leave indelible white scars. Gummy tumors form solid nodules beneath the skin. Presently the skin becomes absorbed over the tumor, and, bluish-red in color, breaks down in slow ulceration. Sometimes the mass is absorbed before ulceration is reached (Hill and Cooper¹²).

of the gumma may assume any shape, and if not properly treated soon increases in size and depth. The floor of the ulcer is usually ragged and covered with dirty grayish matter which cannot be readily removed. The discharge from the ulcer is often excessively offensive. In several of the reported cases, necrosis of parts of the auricular cartilage and exfoliation of the sequestra occurred, and in Field's case two-thirds of the auricle was destroyed. As a rule, comparatively little deformity seems to result from this affection, sometimes even when the infiltration is extensive and the ulcer large and deep; very often an indelible, depressed white scar is in after-years the only evidence remaining of the gumma. In Barklay's case, in which the cartilage of the concha, tragus, and canal was exfoliated, the general outline of the ear remained normal. The first abnormality to strike the attention was the peculiar deformity of the concha, the upper and lower limits of which were preserved, while the tragus and meatus were absent. The beginning of the helix above was at an oval pit in the concha, and the intertragal notch below was a circular pit. There was a shining, bulging, yellowish spot—resembling somewhat a sebaceous cyst—right over the site of the normal meatus, upon a strong band of cicatricial tissue, extending downward and backward from a spot above and in front of the site of the normal tragus, which band completely closed the meatus. Except a slight tightening of the skin, a seeming loss of subcutaneous tissue on the anterior side, and a slight drawing outward and forward of the auricle, it was otherwise apparently normal. Above and anterior to the site of the normal tragus, and near that of the temporo-maxillary articulation, was a stellate cicatrix.

Packard's case²⁵ was that of a negro twenty-five years of age. A painful swelling, fluctuating on pressure, developed in the upper portion of the auricle twelve years after the primary sore. There was no history of injury. Under treatment the auricle attained its normal condition, except for the presence of some hardening and thickening of the cartilage, in a month.

The diagnosis of the diseases under consideration, as well as of those which I shall treat farther on, must rest largely on the previous history of the case. If syphilitic infection is denied, and necrosis of, or gummata on, the bones are absent, careful search should be made for scars and marks left by secondary affection of the skin and mucous membranes. An ulcerated tubercle may possibly be confounded with lupus vulgaris and scrofulous ulcer. In both of the last-named affections there is, however, very frequently considerable redness and oedema of the skin around the ulcer, while the syphilitic ulcer is, in most instances, sharply bounded by healthy-looking skin. Lupus vulgaris begins, moreover, usually before puberty; its course is much more chronic, and there is but little discharge from the ulcer.

From an ulcerating epithelioma* the syphilitic ulcer

* *Differential Diagnosis between Ulcer, Tubercle, and Cancer.*—Hutchinson (*loc. cit.*, p. 511), speaking of the differential diagnosis between cancer and syphilis, says: "I am most anxious to insist on its extreme difficulty. The surgeon who trusts to rules, or who ventures to rely with confidence on his own powers of observation as regards minute differences of appearance between cancerous and syphilitic ulcers, will often make serious mistakes. Cancerous processes may be simulated by syphilis in the closest possible manner. As a general rule, it may be said that we distinguish between a cancerous ulcer and one that is syphilitic by observing that in the former a process of growth precedes that of ulceration, whereas in syphilis it is at best only one of chronic inflammation. Without doubt this is a most important distinction. In syphilis the edges of an ulcer may be greatly indurated and its base may be firm, but there are seldom any sprouting masses on the surface, or any well-defined margins to the induration, such as we encounter in cancer. Exceptions, however, occur even to this statement, and now and then even a syphilitic sore may be covered with bossy masses of firm granulation structure which closely resemble epithelioma. I possess more than one drawing in which the ordinary features of rodent ulcer, its clean surface, and its sinuous, rolled edge of induration, were so exactly imitated by tertiary syphilitic sores that we had to appeal to treatment for diagnosis. I have not attached much importance, for diagnostic purposes, between syphilis and cancer, on the presence or absence of implication of lymphatic glands. Nothing can be more illusory than to teach that enlargement of the lymphatic glands is one of the features by which cancer can be distinguished from other local disease. There is no doubt, however, that in any case which comes under observation late, and with enlargement of the

can generally be distinguished by the absence of enlarged glands in the neighborhood, and by the more offensive odor of the discharge.

The treatment of these affections does not differ from that of tertiary manifestations in other parts of the body. Iodide of potassium, alone or combined with mercury, will cure these cases.

Local treatment alone was of no avail in any one of the cases reported.

EXTERNAL AUDITORY CANAL.—This part of the ear is not very rarely the seat of *Broad Condylomata* (*Mucous Warts*) and of ulcers in persons suffering from constitutional syphilis. The occurrence of the condylomata of the external canal is mentioned by Moos and by Troeltsch; but for the first full description of this affection and its treatment we are indebted to Stöhr,²⁵ who had the opportunity of seeing fourteen cases of this disease in about three years. Wilde's (*loc. cit.*, 222) case, published nearly twenty years before Stöhr's paper appeared, may, as Knapp suggests, have been also one of syphilitic origin; but Wilde, who throughout his book shows that he was familiar with the manifestations of syphilis in the ear, says expressly that the patient was otherwise healthy, and attributed her affection to cold.

Since Stöhr's publication broad condylomata have been observed and described by Buck,¹⁵ Knapp,²⁶ Christneck,²⁷ Noquet,²⁸ Zucker,⁷ Purjesz,²⁹ Felici,³⁰ Trautmann,³¹ Kochner,³² Desprès¹ found among 1,200 syphilitic patients (980 of whom had condylomata in various places), 5 cases of condylomata of the external canal; while Ravogli was unable to find a single case of condylomata of the external canal in 144 syphilitic individuals (77 of these had condylomata in other parts of the body) whose ears he had examined. Buck saw but 2 cases in 3,976 ear patients; Knapp met with only 1 case in from 9,000 to 10,000 ear cases; and the writer of this has seen but 2 cases out of about sixteen thousand ear patients. Analyzed with regard to the sex, the published cases show a preponderance among the females. In most cases but one ear was affected. As a rule, condylomata of the external canal appear early in constitutional syphilis, while other skin eruptions, ulcerated papule on the fauces, and glandular swellings are present. In most cases purulent inflammation of the middle ear, sometimes of long standing, precedes the development of the growth. Condylomata begin as broad, slightly reddish papule, the surface of which at first is dry, but soon becomes moist. The papule gradually grow in size, and when situated close to each other they coalesce into large patches. These are often subdivided by rhagades. In most cases the upper surface of the excrescence, which is at first smooth and somewhat convex, becomes ulcerated and secretes a sero-purulent fluid, which often causes inflammation and ulceration of the adjacent parts free from these growths. If ulceration does not occur, the epidermis covering the excrescence becomes thickened, whitish, and granular. These growths often occur in great numbers in all parts of the canal, and may even be seated on the drum membrane. Sometimes they not only fill the canal, but also protrude out of the external meatus. The excrescences are at first painless, but after ulceration has occurred they often cause severe pain, which is increased by movement of the jaw. More or less impairment of hearing and tinnitus usually result from the obstruction of the canal, and occasionally a purulent inflammation of the middle ear is developed subsequent to the appearance of the warts. In one of Buck's cases (*American Journal of Otology*, i, p. 26), a man, aged

glands already existing, we may take this part as important evidence in support of the diagnosis of cancer. Neither in secondary nor tertiary syphilitic lesion is it at all common for there to be any implication of lymphatics." "In very obscure cases the aid of the microscope should be invoked, and if this should fail to give positive evidence one way or the other, the patient should be given the benefit of the doubt and be put under antisyphilitic treatment. In cases in which it is desired to use treatment as a means of diagnosis, the best plan will usually be to rub in mercury pretty freely, and to give iodide of potassium by the mouth at the same time. Under this plan any growth or ulcer of syphilitic origin ought within a week or ten days to change its features in an unmistakable manner."

twenty-eight, who had had otorrhœa for seven months before, but whose hearing was not impaired, the orifice of the meatus was found almost completely obliterated by the presence of an elevated patch of what seemed at first granulating tissue. The dividing line between this patch, which completely encircled the orifice and the healthy skin of the auricle, was sharply drawn, the edges of the elevated portion being quite abrupt. In Knapp's case, the condylomata developed a few months after infection, and when the patient came under his observation, six months after he had contracted syphilis, he found the ear canals filled, and the external orifice of the meatus and the adjacent parts of the concha occupied, all around, by reddish, wart-like excrescences resembling the syphilitic condylomatous growths so often seen at the anus. Some of these were ulcerated at their apices and discharged a thin, watery fluid. A papular syphilitic covered the whole body, and was very marked on the forehead. In the soft palate there were ulcers with unclean bottom and raised concave edges. The glands of the neck were swollen, and the patient was very pale and weak. During the first weeks of treatment, however, there was an aggravation of the affection of the pharynx. She suffered intense pain in the ears, and was relieved when profuse purulent discharge from the ear set in. The walls of the ear canals were so much swollen that no speculum could be introduced; yet the characteristic whistling sound on inflation showed that both drumheads were broken. The patient recovered fully under antisyphilitic treatment.

The diagnosis of broad condylomata of the external canal can usually be made without difficulty, as manifestations of secondary syphilis are almost always present in other parts of the body at the same time.

The prognosis is favorable. Under constitutional antisyphilitic treatment and the local applications to be mentioned, the excrescences usually shrink rapidly, and eventually disappear entirely. Depressed cicatrices, destitute of hair, sometimes remain, but permanent contraction of the canal very rarely follows this affection.

Constitutional treatment alone will in most cases cause the condylomata to disappear. But if they occlude the canal and cause retention of the discharge from the tympanic cavity, they may be abscised or carefully cauterized with nitrate of silver in substance. Thorough cleansing of the canal with warm salt water and inflation of the middle ear should also be practised if suppuration of the middle ear is present. In some cases benefit was apparently derived from dusting iodoform or calomel on the excrescence, or washing the same with a one-per-cent. solution of nitrate of silver.

Syphilitic ulcers of the external canal seem to have been observed by some of the older writers, as Bell, in his work on Luës, speaks of deafness produced by a "scruffy" eruption, and sometimes ulceration of the external auditory passage, occurring as a consequence of that disease. Referring to this Wilde says: "But his description is not sufficiently accurate to be depended upon, and has not been confirmed by subsequent observers. No doubt, cutaneous syphilitic disease will extend by ordinary continuity of surface into the meatus, but as a special form I am unacquainted with it" (*loc. cit.*, p. 198). Since Wilde's time such ulcers have, however, been frequently observed, and have been studied especially by Schwartz.³³ According to this author they are usually annular in form and covered by a dirty, grayish-white exudation. Their edges are usually greatly swollen, and may thus cause considerable diminution of the calibre of the canal. They were seated in the outer part of the canal up to the point of union of the cartilaginous and osseous portions, and were found in one or both ears. He saw these ulcers in ears with normal membranes and healthy middle ears, but in most cases they were associated with chronic purulent inflammation of the middle ear and perforation of the drum membrane. The glands in the vicinity of the ear were always much swollen in these cases, and other manifestations of constitutional disease were never wanting. The treatment recommended by Schwartz consists in

energetic cauterization with nitrate of silver in substance, which, though painful, may be relied upon to heal the ulcer. Hinton³⁴ has also seen secondary syphilitic ulceration of the meatus, mostly in the form of a narrow, unhealthy ulcer at the orifice, attended with an ichorous discharge and general inflammation and swelling of the passage. The appearance and history sufficiently mark its character, and in the cases Hinton³⁴ saw, iodide of potassium and black wash brought about a cure. A case of this kind has been described by Buck.¹⁵ The patient had acute purulent inflammation of the middle ear, with perforation of the drum membrane. The ulcer occupied the lower wall of the outer half of the canal and extended outward upon the auricle. The limits of the ulcer were well defined. The chancre had appeared one year before, and there was also syphilitic pharyngitis.

Politzer has observed two cases of this description. In one, with chronic purulent inflammation of the middle ear, the ulcer occupied the lower lateral wall of the cartilaginous portion. Syphilitic ulcers of the pharynx were present at the same time. In the other, the ulcer extended along the entire length of the cartilaginous portion, and a second ulcer with everted edges occupied the concha.

In a case reported by Jacobson,³⁵ the patient had been afflicted, up to within a few months before he came under observation, with chronic suppuration of the middle ear. He was suffering intense pain in the head, and had other symptoms of cerebral irritation. He had contracted syphilis six months before, and had ulcers on the palatine arches at the time. The ulcer, which was seated at the entrance of the right external canal, was of the form of a ring, its floor was covered with an adherent, dirty, whitish-gray exudation, and its margin was much swollen. It was very sensitive to the slightest touch, and the tragus and mastoid process were tender on pressure.

Diagnosis.—Non-specific ulcers of the external canal are very rarely seen, except in children with neglected purulent inflammation of the middle ear, and in eczema of the canal in adults, and the presence of an ulcer should therefore always arouse suspicion as to the existence of constitutional syphilis. It seems hardly possible that the opening of a furuncle can be mistaken for ulcer by any one at all familiar with ear affections. In cases of syphilitic ulcer the glands near the ear are always swollen, and other signs of syphilis are never absent.

Diffuse inflammation of the external canal due to syphilis is said by Ladreit de Lacharrière to be of frequent occurrence in the secondary stage. According to this author both canals are usually attacked simultaneously; there is only moderate swelling; the skin is red and cracked, and the discharge is very offensive. But McBride³⁶ appears to be the only other author who has seen such a case, and in his there was no disagreeable odor. If we exclude the cases in which papule or condylomata are present, the secretion from which causes inflammation of the lining of the parts of the external canal free from them, instances of diffuse inflammation of this part are doubtless very rare in syphilitic persons. The writer of this article has seen but a single case of this kind, and this occurred many years after infection, and was associated with non-purulent inflammation of the middle ear, and caries of the superior maxillary and palate bones of the same side. In this case the walls of the osseous part of the canal were very red and somewhat swollen. The pain was very great, and not much relieved by repeated deep and long incisions, which at no time liberated pus. The walls were at no time covered by exudation, and there was but little secretion from them. The drum membrane was but little inflamed, and although it was repeatedly freely incised in the hope of giving exit to supposed pent-up secretion in the tympanic cavity, none escaped. The Eustachian tube was almost impermeable. After much and long-continued suffering the pain subsided eventually while the patient was taking iodide of potassium; complete deafness remained.

The characteristic symptom of syphilitic inflammation of the external canal is said to be very severe pain, even when the swelling is not very great, which is not relieved by the usual remedies, but yields at once to constitutional treatment (Schwabach).

Exostoses of the external canal may, according to Gruber, be caused by syphilis; but nearly all other writers deny that syphilis has anything whatever to do with the production of these growths.

THE DRUM MEMBRANE.—This part of the ear appears to be but rarely the seat of syphilitic infiltration and growths. Lang³⁶ observed a case in which there was a large, pale, glistening papule at the place of the short process of the hammer on a drum membrane; the membrane itself was very red in its anterior upper quadrant, and slightly opaque throughout. The patient was a woman, with early symptoms of constitutional syphilis.

Condylomata, as we have seen, have been found here in a few cases, in which these growths existed also on the walls of the canal.

Baratoux³⁷ has recorded the case of a woman in whom he found five small gummata on the cheek, in front of the ear; a sixth on the mastoid process; three in the concha and outer part of the external canal; a small egg-shaped, prominent, faintly opalescent, gummatous tumor on the lower posterior part of the drum membrane; and a small, round ulcer, covered with a yellowish-white, adherent substance, in front of the handle of the malleus.

The gumma on the drum membrane became ulcerated at its summit in a few days, while the ulcer was cicatrizing.

MIDDLE EAR.—The diseases of the middle ear observed in individuals afflicted with constitutional syphilis do not differ essentially, in their objective and subjective symptoms, from the same diseases occurring in non-syphilitic subjects. Most writers are agreed, however, that the syphilitic forms are characterized by a marked tendency to implicate the labyrinth, or, to speak more precisely, by the appearance of symptoms commonly regarded as indicative of disease of the auditory nerve, at an unusually early period. The middle-ear disease may present itself in the form of an acute catarrhal inflammation, a chronic catarrhal inflammation, a purulent inflammation, or as a neuralgia of the tympanic cavity.

Acute Catarrhal Inflammation.—This disease is usually, but by no means always, associated with syphilitic disease of the naso-pharyngeal cavity. Frequently but one ear is affected, and in such cases the disease of the pharynx is usually found to be confined to that side. Sometimes this consists of only a superficial erosion. In many cases the ulceration is confined to the posterior wall of the pharynx, behind the velum palati, and, as in this location it rarely causes the patient much inconvenience, it may be overlooked if an examination with the rhinoscopic mirror is omitted.

The subjective and objective symptoms, and the course of syphilitic acute catarrhal inflammation, resemble so closely the idiopathic form that a description of the same seems unnecessary in this place. Schwartz (*op. cit.*, p. 134) asserts that an impairment in the conduction of sound through the bones occurs regularly at an early period in this disease, and adds that it is not known to what this is due. The present writer has, however, seen a number of cases of this affection in which the bone conduction remained unimpaired throughout.

With regard to the treatment, it is only necessary to state that, in addition to the local measures usually employed in the idiopathic form, a course of antisyphilitic remedies will be found necessary to cure the disease of the ear and the pharynx. In this connection it may be well to point out the danger arising from using, on healthy persons, catheters and other instruments that have been employed on syphilitic individuals. Boiling the instruments in a five-per-cent. solution of carbolic acid may possibly be sufficient to destroy the virus, but in the opinion of the writer it would be far safer to provide each patient with instruments for his exclusive use.