Mr. CHEATLE said he did not feel inclined to try it, and that the post-aural operation would be much easier and more reliable. Using tubes in the meatus was a hopeless business.

Mr. MACLEOD YEARSLEY showed *Two Specimens of Pedunculated Exostoses.*

1. Pedunculated exostosis removed from the right meatus of a man, aged forty-five, by means of a cold wire snare. The patient came to the hospital in April, 1897, complaining of a "growth" in his ear.

2. Pedunculated exostosis removed from the left meatus of a woman, aged twenty-one. The growth was tightly packed round with cerumen, the deafness resulting caused her to seek relief. It was removed on December 31, 1901, under gas, with a pair of dental stump-forceps.

Abstracts.

MOUTH, FAUCES, Etc.

Wood, George B.—*The Pathogenesis of Lacunar Keratosis of the Tonsil.* "University of Pennsylvania Medical Bulletin," vol. xiv., No. 11, January, 1902.

This article should be read by all who still believe in the specific etiological properties of the leptothrix.

Theodor Hering was the first to have any idea of the true pathology of the disease, showing the process to be essentially a keratosis of the epithelium of the tonsil. He erred, however, in that he believed the leptothrix to possess etiological importance. Siebenmann, a few years later, developed more fully the keratotic theory of the disease, and also clearly demonstrated that the leptothrix and allied organisms described by Miller were not pathogenic, but existed merely as saphrophytes.

The author considers lacunar keratosis of the tonsil, variously termed benign mycosis of the pharynx, phycosis faucium leptothricia, mycosis pharyngitis leptothricia, and suchlike, is a much more common condition than is ordinarily supposed. In 1873 B. Fraenkel[1] described a case of what he termed benign mycosis of the pharynx. There were few symptoms, though the disease was very stubborn in yielding to treatment. Nine years later, in 1882, E. Fraenkel[2] described very accurately a similar case, and believed that the disease was due to the action of a specific bacillus, which up to that time had not been discovered, but was subsequently described by Sadebeck, who called it the *Bacillus fasciculatus*, because of its tendency to run in parallel bundles.

The condition of the tonsillar crypt and the mycotic plug filling it were first noted by Hering,[3] who found that the greater part of the plug consisted of flake-like layers of epithelium surrounded by a fine

granular mass, permeated with leptothrix threads. The supposed leptothrix, when subjected to Lugol's solution, turned blue. According to Hering there are two distinct forms of these epithelial masses: one a superficial excrescence, which grows fast to the epithelium, and is made up of layers of hornified squamous cells; the other a wedge-shaped, triangular plug, which breaks through the epithelium and penetrates more or less deeply into the parenchyma of the tonsil. The only change which he could find in the tonsil itself was a thickening of the epithelium, the cells lining the dilated crypts frequently being multiplied to such an extent as to make the epithelium three times as thick as normal.

Up to this time it had been believed by all specialists that lacunar keratosis was due to the specific action of some form of the leptothrix, but because of the apparent impossibility of successfully cultivating this organism on the ordinary culture media little was really known as to its exact nature. W. D. Miller[4] says that the mycosis tonsillaris benigna, described by Fraenkel in 1873, is not due to one specific organism, but to numerous forms of bacteria, which may be found extending rather deeply into the tonsillar crypts. The most important of these is the *Bacillus buccalis maximus*, which occurs as large bacilli, isolated or in chains, or more frequently in long segmented threads grouped in parallel bundles. It is very similar in form to the leptothrix, but can be distinguished from this latter organism by its property of turning blue when treated with iodine. The threads of this bacillus, however, do not stain evenly with iodine, but some portions, perhaps whole threads, remain clear and without colour, while the rest show the characteristic violet blue. Closely related to the above bacteria is the *Leptothrix buccalis maxima*, differing only in that the individual segments of which the threads are composed are somewhat longer and do not turn blue on the addition of iodine. Miller says that perhaps the bacillus is only a younger form of the leptothrix. The *Iodococcus vaginatus* occurs in the mouth as chains of encapsulated cocci, the cocci themselves turning blue with iodine, but the capsule remaining unchanged. None of these organisms, according to Miller, can be grown on any known culture media.

A somewhat different view is that taken by Jacobson,[5] who reports observations on seventeen cases of what he terms *algosis faucium leptothricia*. In these cases he said that the disease manifested itself as spots, nodes, plugs, or cheesy masses, which grew not only out of the mouths of the tonsillar lacunæ, but also out of the mouths of the racemose glands. He believed that the masses which filled the crypts consisted of the *Leptothrix buccalis* associated with a chalky deposit; he was not able to find the signs of keratosis described by Hering. He classes the leptothrix under the algæ, and believed that they belong to a variety which is capable of secreting a chalky substance. Further, he claims to have successfully cultivated this organism on potato, the resulting growths resembling very closely those found in the tonsillar crypts, and, like the tonsillar growths, turning blue on the addition of iodine. This view of lacunar keratosis, which undoubtedly is the disease Jacobson had in mind, did not tend to clear up its pathology, but rather helped to throw more or less doubt on the earlier knowledge of the disease.

Siebenmann[6] made a very careful histological study of sections cut through the diseased crypts, and was the first to demonstrate their true pathology. He found the lacunæ of the tonsils filled and dilated with

a keratotic mass consisting partly of layers of hornified epithelium and partly of a homogeneous material resembling hair. This mass projected from the mouth of the crypt in a bristle-like protuberance, possessing a narrow lumen filled with detritus, bacteria, and mucus, while the exposed portions of the bristle were frayed and permeated with leptothrix threads. The only change which he found in the tonsillar parenchyma was a slight decrease in the amount of adenoid tissue, while the neighbouring structures appeared entirely normal. The epithelium of the surface of the tonsil was unchanged, but that lining the crypt was considerably thickened. Siebenmann concludes that the above-described condition is one which resembles very closely the appearance of a growing hair, and that the process should be looked upon almost as an irregular hair formation. In contrast to the opinion of early observers, he denies any etiological importance to the leptothrix or other bacteria, believing that they are present in a saprophytic capacity only. In further support of this view, he brings to mind the fact that the leptothrix is frequently found in various forms of ulceration of the mouth, especially in cancer, or indeed in any place where decaying organic material is present to afford a good soil for its growth.

Seifert and Kahn,[7] in spite of the foregoing work of Siebenmann, believed that the *Bacillus buccalis maximus* is more or less responsible for the production of mycotic pharyngitis. They grant, however, that this bacterium is found only between the most superficial layers of the epithelium, and never penetrates into the deeper structures; also that the bacteria do not show any tendency to destroy living tissue.

Jonathan Wright[8] says that pharyngeal mycosis may be caused by a variety of organisms, such as the mycelium, *Leptothrix buccalis*, and the *Bacillus buccalis maximus*.

J. E. Newcomb[9] quotes the theory advanced by Kelly of Glasgow, and says that, while there is probably much truth in his idea, he is not ready to accept the same as absolutely proven. Kelly said that there are several diseases confounded under the name of mycotic pharyngitis, one of which is a keratosis of the tonsillar lacunæ, and another a true mycosis in which the leptothrix is undoubtedly the exciting cause. Further, that these two conditions may be distinguished from each other by the following peculiarities:

1. Keratosis appears in the prime of life; mycosis may affect any age.

2. The cause of keratosis is unknown; mycosis is generally caused by some local abnormality of buccal secretion or of the digestive tract; possibly by some diathesis, as rheumatism.

3. In keratosis the symptoms are slight or absent; in mycosis they are pronounced.

4. In keratosis the surrounding mucosa is normal, while in mycosis it is inflamed.

5. In keratosis the excrescences are tough, firmly adherent, and assume characteristic shapes; in mycosis they are soft and easily removed.

6. Keratosis is confined to some part of Waldeyer's ring, while mycosis may appear at any point between the mouth and stomach.

7. Mycosis shows a resemblance to other mycoses, as thrush and sarcinia, while keratosis does not (if we leave the leptothrix out of account).

8. Local application will cure mycosis, while it has no effect on keratosis.

Chavas[10] speaks of benign mycosis of the upper air-passages as caused by the *Leptothrix buccalis*, which organism, he says, exists normally in the buccal cavity, especially in the irregularities and in the deposits on decayed or unclean teeth. The most favourable points of development of the disease are: (1) the fauces; (2) the base of the tongue, and especially the glosso-epiglottic folds; (3) naso-pharynx; and (4) nasal fossæ. He says that in the two former situations the disease may be found as a sort of a polyp, very hard and resistant, while in the pharynx and naso-pharynx it forms little points or white plaques. He believes that there are predisposing causes, but the two essential conditions for the development of the parasite are buccal fermentation and salivary acidity.

Epstein[11] reports five cases of what he terms "pharyngitis chronica leptothricia" occurring in children, the youngest child being three years of age and the oldest ten. He based his diagnosis on the chronic course of the disease, the futility of treatment, and the microscopical examination, though the application of iodine did not give the starchy reaction, simply staining the organisms a deep brown.

R. M. Pearce[12] reports two cases of leptothrix infections: one occurring concomitant with tuberculosis of the larynx, and the other associated with cholelithiasis. In the first case, Pearce believed that the leptothrix was pathogenic, and not saphrophytic, for the following reasons: (1) In both the disorganized cartilage and the wall of the œsophagus, although cocci were abundant in the superficial necrotic material, none were found in the deeper portions, where the leptothrix alone could be seen extending into apparently healthy tissue; and (2) if the growth of the leptothrix is influenced by the amount of necrotic material, then an abundant growth should have occurred over all parts of the abscess wall, whereas it was strictly limited to the portion containing the disorganized cartilage.

The author describes in detail the histological examination of five cases. The study of these cases, the author considers, confirms the result obtained by Siebenmann, and disproves all other existing theories as to the nature of lacunar keratosis of the tonsils. As previously stated, Siebenmann claimed that the process is essentially a conversion of the superficial layers of the lacunar epithelium into a keratoid mass, which fills and dilates the crypt, finally projecting on the free surface of the tonsil, where it is subjected to the action of the buccal secretions and the various organisms of the mouth and throat. The growth of the leptothrix and allied bacteria is of a saprophytic nature, and they have nothing to do with the causation of the disease.

The author has shown (1) that the keratosis begins at the bottom of the crypt, removed from all outside influences; (2) that the process may develop to quite a marked extent, even projecting beyond the free surface of the tonsil, without the presence of the leptothrix or like organism; (3) that the growth of the leptothrix, or *Bacillus buccalis maximus*, is limited to the external layers of the mass, and is associated with various cocci and other bacilli. The above facts clearly demonstrate the saprophytic rôle played by the leptothrix in this disease.

He believes that the beginning and possibly the development of this keratoid mass is due to a moderate degree of inflammation of the parenchyma of the tonsil. This idea he does not consider as absolutely proven, but it seems more than possible, for the following reasons: The epithelium lining the crypt of the tonsil holds a much more intimate relation with the parenchyma of that organ than generally exists

between these structures in other places. There is no subepithelial connective tissue, and therefore the various cells of which the adenoid tissue is composed find a ready access to the lacunæ by passing out between the epithelial cells. This condition can be clearly shown in almost any tonsil, and especially if there is even a slight inflammation. In a highly-inflamed tonsil the migration of round cells and leucocytes through the lacunar epithelium is so great that the epithelium often loses its identity, the epithelial cells themselves apparently disappearing. It does not seem improbable that the presence of leucocytes between the epithelial cells may act to a greater or less extent as an irritant to the epithelium, and when the outwandering of the leucocytes is not sufficiently great to destroy the epithelium, the irritant may be a stimulant to growth. When a squamous stratified epithelium becomes abnormally active, the resultant growth is frequently seen in the formation of a keratoid mass, as evidenced by the pearly bodies of epithelioma and the callosities of the skin following mechanical irritation. In all the cases of lacunar keratosis described, a moderate degree of inflammation was found, even when the tonsillar tissue was greatly reduced in amount, and in crypts where the keratoid process was only beginning the epithelium was more or less permeated with lymphoid cells and leucocytes, while its lumen was filled with an exudate consisting of these same cells interspersed between layers of the desquamated squamous epithelium. Supposing that there is an inflammation sufficiently intense to cause such a continual outpouring of leucocytes as to fill the lumen of the crypt, it may be readily understood how the more or less liquid exudate finds an exit out of the mouth of the crypt, and carries the desquamated squamous cells with it, giving the picture seen in acute lacunar tonsillitis. A less degree of inflammation causes the formation in the crypt of cheesy masses composed of a smaller number of leucocytes mixed with desquamated squamous cells. This may be seen in chronic lacunar tonsillitis. A still less degree of inflammation, sufficient only to stimulate the epithelium, gives rise to keratosis, the desquamated squamous cells, firmly packed in concentric layers, producing the keratoid mass. It will be noted in the cases reported that where the keratotic process is well advanced the epithelium surrounding the mass is generally thickened and is always very distinct in its outline, and is not infiltrated with extraneous cells. Hence it seems likely that the inflammation, while not sufficient to cause a marked outpouring of leucocytes, has stimulated the epithelium to an increased growth, and this, the author believes, is the true cause of lacunar keratosis.

This keratosis may develop in any of the tonsils, though more frequently in those in which the cryptal epithelium is of the squamous pavement variety. Before it can develop in the pharyngeal tonsil it is necessary that the epithelium be converted from the columnar ciliated type to the squamous pavement. That this frequently takes place may be readily seen by anyone who will take the trouble to examine sections of the pharyngeal tonsil.

The author has arrived at the following conclusions:

1. The disease commonly called mycosis pharyngitis leptothricia is a true keratosis of the epithelium lining the crypts of the tonsils.

2. The *Leptothrix buccalis maxima*, the *Bacillus buccalis maximus*, and like organisms, do not possess any etiological importance, but are present simply as saphrophytes.

3. The disease is probably the result of a moderate degree of

inflammation of the parenchyma of the tonsil, causing an increased growth of the normal epithelium of the crypts.

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W. Jobson Horne.

NOSE AND NASO-PHARYNX.

Butler, B. F. (London, Ont.).—*Cyst of Right Nasal Passage.* "Canada Lancet," February, 1902.

In this instance the cyst was attached to the under surface of the middle turbinated body near its posterior end. The naso-pharynx contained a large myxo-fibroma attached to the upper edge of the posterior naris of same side. Both growths were readily removed, and there was no recurrence. The nature of the cyst was disclosed through the rupture of the thin walls of the sac, and the expulsion of the yellowish liquid contents during the tightening of the wire in removal.

Price-Brown.

Lichtwitz.—*Treatment of Lupus of the Ear and Nose by Hot Air.* "Arch. Internat. de Laryngologie," etc., January, 1902.

The author, in a paper read before the Laryngological and Otological Society of Paris, speaks highly of this method of treating lupus in the nose and ear. He describes the apparatus used by Holländer in 1897, which he (the author) has modified by the addition of intranasal tubes. The air is passed over a platinum wire heated by electricity. A temperature of 80° seems sufficient, and it is not necessary to go beyond 120° or 130° to produce necrosis of the lupoid tissue.

The application does not require either a local or a general anæsthetic. Healing takes place rapidly, and does not cause much scarring. Lichtwitz has only tried the treatment in three cases (two of the ear and one of the nose), but the results obtained lead him to believe that in cases of lupus in these organs it is the treatment *par excellence*.

Anthony McCall.

LARYNX.

Garel, J.—*A Burn of the Larynx caused by a Dupuytren's Pill.* "Annales des Maladies de l'Oreille, du Larynx, etc.," No. 1, January, 1902.

A patient who had been taking Dupuytren's pills for some time found that he had difficulty in swallowing them; he had smaller pills