THE

JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

VOL. VI. FEBRUARY, 1892. NO. 2.

Original Articles are accepted by the Editors of this Journal on the condition that they have not previously been published elsewhere.

Twenty-five reprints are allowed each author. If more are required it is requested that this be stated when the article is first forwarded to this Journal. Such extra reprints will be charged to the author.

The Editors are not responsible for opinions expressed in original Articles or Abstracts in this Journal.

Editorial Communications are to be addressed to "Editors of JOURNAL OF LARYNGOLOGY, *care of The F. A. Davis Co., 40, Berners Street, London, W."*

PHARYNGO-MYCOSIS.

By HENRY BIXBY HEMENWAY, A.M., M.D., Evanston, Illinois, U.S.A.

Read before the Chicago Medical Society, Dec. 7, 1891.

UNDER the general term "pharyngo-mycosis" has been grouped a class of afflictions which often cause the general practitioner considerable trouble and annoyance. While some forms have been known and well recognized for years, others are still often overlooked, even by specialists. Text-books barely mention them. There are few articles in medical journals upon the subject. The nature of the trouble does not compel close study, and the majority of the cases fall into the hands of general practitioners rather than specialists; hence it is that most cases of pharyngo-mycosis are confused with other disorders.

Accuracy of diagnosis is ever desirable, but it may not always be essential for correct and successful treatment. This is not the fact with regard to the mycetes growing occasionally in the human throat. The differential diagnosis between mycosis and follicular pharyngitis is necessary for curative treatment.

The word mycosis has been more frequently used with reference to a form of skin disease. Dunglison in his "Medical Dictionary" gives no definition of the word alone, but mentions m. famborsia, m. intestinalis, and m. vaginal. Gould's "New Medical Dictionary" gives these definitions of mycosis, "a disease of the skin," &c., and "a mucous or polypoid growth." Billing's Dictionary gives no further light; Thomas' "Pronouncing Medical Dictionary" gives two definitions and two derivations

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

for mycosis. Deriving from the Greek μῦκος (mucus) a word which Stephanus[1] does not give, he says "a mucous polypus"; or taking it from μύκης (fungus), he says "a fungous fleshy tumour." The insertion of the word "fleshy" in the last definition is misleading, and makes the definition secondary. In no dictionary consulted did I find reference to pharyngo-mycosis, or a definition applicable to that condition.

Following the example of Dunglison, the "Century Dictionary" and others have given as the derivation the Greek "myces" and "osis" (using Roman type). This is not correct. There is no Greek or Latin word "osis" that could with any propriety be united with *myces* to form mycosis. Neither can I find any authority in either Greek or Latin for adding "osis" to a noun stem. Moreover, the stem of *myces* is not *myc*, but *mycet*. In Greek the ending σις (sis) is often added to a verb stem to form a noun; thus we have σκληρόσις (sclerosis) from σκληρόω, and καταλυσις (catalysis) from καταλύω. Hippocrates uses a verb μυκόω, which has by the best authority[1] been associated with μύκης, in origin and meaning. This, then, is the origin of the word mycosis.

Mycosis, therefore, is a fungus-bearing condition, and is to be distinguished from myces, and its plural mycetes, which refer to the fungi themselves. Pharyngo-mycosis signifies a fungoid condition of the pharynx. Since the tonsils are especially liable to be the seat of the parasite, we frequently find the more limited designation *tonsillo-mycosis*, or *mycosis tonsillaris*.

The forms of pharyngo-mycosis which have so far been recognized are those resulting from the growth of the oidium albicans (which has more recently been identified with the mycoderma vini, and the saccharomyces albicans), nigrites linguæ, sarcinica, actinomyces, aspergillus fumigatus, leptothrix buccalis, and the bacillus fasciculatus. By many the term is used only with reference to the last four of these forms. Thrush is a disease long recognized, and generally located in the mouth; nigritis is generally confined to the tongue. Since both are so well known, and so fully described in text-books, and since, further, their residence in the pharynx is accidental and secondary, I shall follow the example of others, and use the term in the more limited sense.

I have been led to give the above definitions and etymological remarks because, in the study of the case, of which the history is here given, I was misled by the dictionaries. After a most careful search I have been able to find only a very few references, in either books or journals, to pharyngo-mycosis. I described the case to several professional friends, not one of whom could give me any information. Pepper's "System of Medicine"[2] has a very short discussion upon the subject. Lennox Browne,[3] in his third edition, devotes a portion of one page to "Mycosis Buccalis et Tonsillaris." The "Annual of the Universal Medical Sciences"[4] also mentions it. Hutchinson[5] speaks of actinomyces of the

[1] "Thesaurus Græcæ Linguæ," Stephanus, Vol. V., Paris, 1842.

[2] Vol. II., 1885, pp. 386 and 389.

[3] "Diseases of Throat and Nose" (Lea Bros.), 1890, p. 258.

[4] 1888, Vol. III., p. 284; and 1890, Vol. IV., p. 310.

[5] "Diseases of the Nose and Throat," 1891, p. 42.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

tonsil. Miller[6] makes a few comments upon pharyngeal mycosis. Aside from a few bacteriological notes, articles by the following authors complete the bibliography of the subject, so far as I have been able to find: Vanderpoel,[7] discussed[8] by the Section in Laryngology and Rhinology of the New York Academy of Medicine, November 27, 1888, Newcomb,[9] B. Fränkel,[10] E. Fränkel,[11] Bayer,[12] S. Solis Cohen,[13] Heryng,[14] Grüning,[15] Semon,[16] Leyden and Jaffé,[17] Ferré,[18] Chiari,[19] Siefert,[20] Goris,[21] Gautier,[22] Schech,[23] Töplitz,[24] Boland,[25] and Jacobson.[26] Among the large number of books consulted which do not mention the disorder, are such special text-books as those of Sajous and Mackenzie. Although the literature is meagre, I am satisfied that Dr. Delavan[6] was not mistaken when he said, in discussing Vanderpoel's paper, that the affection was not uncommon. He had noticed in patients afflicted with this microphyte a liability to attacks of acute follicular amygdalitis. As a result of mistaken diagnosis many of these cases are wrongly, and hence unsatisfactorily, treated.

Case.—Miss K., student, aged twenty-three years, came to my office on April 13, 1891, to consult me about a suspicious white spot upon her left tonsil. She had a mild catarrh, and was subject to frequent attacks of "sore throat." Shortly before consulting me she "caught cold," and, as usual, she had a sore throat, which yielded to her usual remedies. A few days later she accidentally noticed the white patch above referred to, and, fearing diphtheria, she sought treatment.

She was slightly anæmic, had no fever, acceleration of pulse or respiration, or any other evidence of constitutional disturbance. Bowels regular, and urine natural. General health good. She said she felt no soreness of throat nor difficulty in swallowing. Teeth were in fair condition; no cavities. Both tonsils were enlarged and slightly congested, especially the left, which was rounder in form. Upon the left tonsil there were two white patches, the largest being two millimètres in diameter, and its apex nearly a millimètre from the thickened surface of the mucous membrane. Both of these growths projected from the tonsillar crypts,

[6] "Micro-organisms of the Human Mouth," 1890, p. 334.
[7] "New York Medical Journal," Feb. 9, 1889, p. 147.
[8] "New York Medical Journal, Dec. 29, 1888, p. 720.
[9] "Medical Record" (N.Y.), Vol. XL.. Aug. 29, 1891, p. 232.
[10] "Berliner Klinische Wochenschrift," 1873, No. 8, p. 94; *ibid.*, 1880, No. 18, p. 263; *ibid.*, 1886, No. 23, p. 265.
[11] "Zeitschrift für Klinische Medicin," No. 4, 1882.
[12] "Revue Mensuelle de Laryngologie," Nov. 1882, p. 329.
[13] "The Polyclinic," March, 1884, p. 133.
[14] "Zeitschrift für Klinische Medicin," 1884, Bd. VII., Heft 4, p. 358.
[15] "Archives of Laryngology," No. 3, 1882.
[16] "St. Thomas's Hospital Reports," XIII., 1883.
[17] "Deut. Arch. für Klinische Medicin," No. 2, 1867 (?).
[18] "Journal de Médicine de Bordeaux," 1887 (?).
[19] "Revue Mensuelle de Laryngologie," No. 10, 1887.
[20] "Revue Mensuelle de Laryngologie," March, 1889.
[21] "Revue de Laryngologie," IX., 1889.
[22] "Revue Médicale de la Suisse Romande," Jan., 1889.
[23] "Krankheiten der Mundhöhle," &c.
[24] "N.Y. Med. Press," No. 3, 1886-87.
[25] "Ann. Soc. Med.-Chir., Liège," No. 24, 1885.
[26] "Samml. Klin. Vorträg. Leip.," No. 317, 1888.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

the larger one being upon the upper back portion of the tonsil. Upon the right there were smaller spots, apparently flat upon the mucous surface. All of these patches, except the largest, resembled ordinary follicular pharyngitis, and I so pronounced the disease, though that one spot excited my interest. I prescribed a mercurial laxative, and a permanganate of potash wash.

A few days later the patient returned, and, much to my surprise, I found the patches larger instead of smaller. The largest spot looked very much like a pile of fly-blows. Its colour was white, with a slight cream tint. Its apex pointed upward, inward, and backward. It clearly grew out from a crypt, the mouth of which was forced widely open, leaving corners unfilled. With a pair of forceps I attempted to remove a little of the substance. There was no calcareous mass, but it was so tenacious that, as I pulled upon the apex, I drew the whole tonsil forward.

I removed a portion, and examined it under the microscope. It contained a few epithelial cells, but consisted chiefly of small rod-like bodies arranged in bundles. I informed the patient that her affliction was neither diphtheria, follicular pharyngitis, nor anything else with which I was acquainted. I was satisfied that the disease was local, and only local treatment would benefit her.

I then began a series of local applications, consisting of boracic acid, carbolic acid, a solution of thymol, eucalyptol and menthol, and tincture of iron. Some of these drugs were strong enough to cause local inflammation, but their direct effect upon the microphyte was negative. Indirectly they may have increased the growth by increasing the local congestion, as manure and cultivation increase field crops. The fungus thrived. Evidently the root of the microphyte was deep in the tonsil, and I doubted the ability of drugs to kill it, without endangering the patient. I therefore urged the use of the electro-cautery. To this the patient objected, especially since I could not tell the name of her disease. She made another appointment and withdrew. My last treatment was on May 5.

About five weeks later I received a note from her saying that at the request of her father she had been home to consult her family physician. This person condemned my treatment, and especially my recommendation of electricity. He told them that the disease was follicular pharyngitis. He prescribed Tr. ferrichlor. et glycerina, to be applied every two days with a camel's-hair brush.

Having by this time convinced myself that this was a case of mycosis, in response to a request the patient came to my office on June 20, and permitted the removal of another sample for study.

The largest mass had been broken off in the crypt. The mouth of the crypt was widely open, as though held by something deeply hid. The other growth on the same tonsil seemed smaller than before. On the right tonsil the spots were larger and more confluent. Though apparently on the surface, they were removed with difficulty. They did not come off like a membrane, but in pieces. There was also a small spot slightly in front of and below the tonsil. At this examination there was nothing to be noticed with the naked eye, which is characteristic of mycosis.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

In July, as the result of exposure at a lawn party, the patient had acute tonsillitis followed by an abundant growth, samples of which were sent to me. She then used "Listerine," and on August 30 reported that the inflammation and swelling had gone, and that all the white spots but one had disappeared.

I suggested the use of a strong solution of Fairchild's glycerinum pepticum and hydrochloric acid. This seemed to have little or no beneficial effect.

August 27. The patient again wrote to me for advice. I repeated my recommendation of the electro-cautery, preferring, however, the action of the negative pole with a non-active positive pole, rather than the cautery snare, for reasons to be given later.

September 17. The tonsils were both very much smaller than when seen before. The right one was flat, and the other round in shape. Each showed several depressions, probably the result of the former growth of fungi, which had disappeared. Upon each there was one white spot, quite different in appearance from those before seen. The larger was upon the left tonsil. It occupied a depression half a millimètre deep and two millimètres in diameter. Apparently the fungus had a very broad base. It differed from the first large fungus seen on the left tonsil in being flat. It differed from the spots formerly seen on the right tonsil in being distinctly granular in appearance, rather than membranoid.

September 18. The patient went with her father to consult an eminent specialist in Chicago. He made no microscopic examination. He agreed in recommending the electro-cautery, which he then used. How deeply the tonsil was cauterized I do not know. The patient has since informed me, that although the specialist called her trouble "chronic follicular pharyngitis," she and her father were convinced that my advice given in April, as well as my diagnosis and prognosis in June, were correct, and that their family physician was mistaken in each.

I have given the above report somewhat at length, as a study of natural history. It shows the chronic character of the fungus, and its tendency to increase and decrease without special outside influence. It shows further the comparative uselessness of medical treatment. I have also attempted to give the characteristics of the growth as seen by the practitioner.

I attempted to make a culture of the bacillus, but my results were of little value on account of lack of facilities, combined with an accident. I inoculated four tubes. Two of the tubes contained gelatine and sugar, while the others contained gelatine without sugar. I found the characteristic growth in the tubes containing sugar, but did not find it in the other tubes. Lack of material prevented me from continuing that line of investigation. The cultivation tests need confirmation.

In my microscopical study I used as staining reagents aqueous solutions of methyl blue, aniline red, and potassium iodide and iodine, and the ordinary compound tincture of iodine.

Without staining, colourless filaments could be discovered with an amplification of 600 diameters. These filaments took the methyl blue

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

stain easily, and thus came out clear. In the first specimens examined these filaments were united in little bundles. These bundles branched, but I do not think the filaments ever branched. In many instances the filaments seemed to branch, but by a slight change of focus or by a higher power I was able to see a separation, showing that the appearance was accidental. In later specimens the filaments were less frequently found in bundles, though frequently found parallel. In earlier specimens there was little granular matter or epithelial plates. In later specimens the granular matter was very abundant, and epithelial cells or plates were not rare.

I have called this granular matter because it so appears. The particles have also been called spores and cocci, the last probably more correctly. In one or two slides I found bacilli with one end apparently enlarged, and surrounded by this granular matter. This led me to regard them as spores. Since, however, I found no such bacilli in either the earliest or the latest specimens the observation needs confirmation. I did not find the granular matter so arranged as to form a line with bacilli.

I frequently found the cocci, if such they are, arranged in an irregular broad band, from which projected, usually at a large angle, bacilli, as may be seen in Figs. 1 and 2.

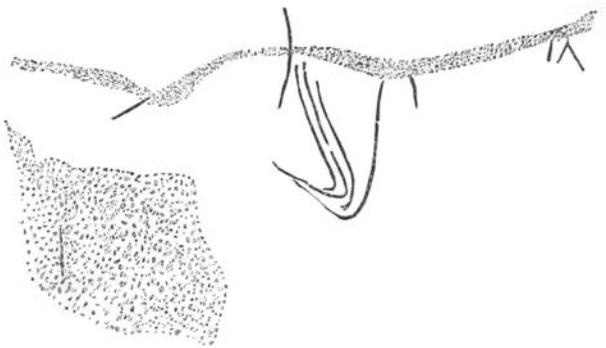


Fig. 1.

The peculiar bacillus of this affection has, by Fränkel and Sadebeck, been called bacillus fasciculatus. I greatly regret that I have been unable to find a description of the bacillus under that name. A large majority of reporters have stated that the filaments are those of leptothrix buccalis. The best description of leptothrix buccalis, which I have seen, is that by Crookshank[27]: "long thin threads ·7—1 m. broad, colourless, "often united in thick bundles or felted together. Masses of cocci occur "with the threads. The threads themselves are composed of long rods, "short rods and cocci. The threads may break up into spiral-, vibrio-, "and spirochæta forms. The last-named occur in large numbers in the "mouth, and have been named *spirochæte buccalis*." The contents of the filaments turn violet with the iodine, while the sheath remains

[27] "Manual of Bacteriology" (Lewis, London), 1890, p. 361.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

colourless. De Bary [28] says that different portions of the same filament may alternately assume blue and yellow colour with iodine. "The length also of the members (cells) is unequal in some cases, not exceeding the transverse diameter, in others several times greater." By aid of cultivation, we are informed,[28] Rasmussen[29] has distinguished three separate forms.



FIG. 2. Bacillus fasciculatus.

I regret that I have discovered no picture of the organism found in pharyngeal mycosis. I feel quite confident that in my case the bacillus is not leptothrix buccalis, for reasons to be stated. Newcomb says [30]: "These link-like processes vary in length, and in some cases curl up at "their ends into fine hair-like filaments." "Besides these spores there are

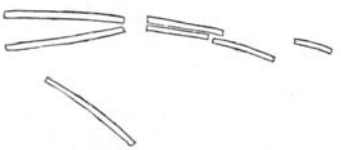


FIG. 3. Leptothrix buccalis.

"round, or oval, highly refractive bodies with dark borders, arranged in "colonies or placed separately between *branching* spores. The whole "goes to make up a network formation composed of spores and refrac- "tive granules." If his spores branch, do they belong to the leptothrix or cladothrix genus? He does not tell what power of lens he used. Van-

[28] "On Bacteria." Translation by Garnsey and Balfour. Clarendon (Oxford) Press, 1887, p. 120.

[29] "Über d. Cultur v. Mikroorganismen," &c., 1883.

[30] Op. cit., p. 233.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

derpoel also says [31]: "These spores were unequally marked off into links, "*with numerous side branches*, and budding ends, separated from the "main stems by indentations or partition walls" (italics mine). The chief distinction between leptothrix and cladothrix is that leptothrix does *not* branch.

Another species of leptothrix (L. gigantea) is thus described by Crookshank [27]: "Long rods, short rods, and cocci can be observed in the same "thread. . . . The threads increase in diameter from base to apex." My specimens do not answer to that description.

Leptothrix is very common in the mouth. It seems to be largely responsible for the decay of teeth. If the growths of pharyngo-mycosis are the result of leptothrix, why are they not more common? Leptothrix is found in large numbers on the gums, close to the teeth. Why, then, do we have these growths in the pharynx and nasal cavity, but not on the gums? I have not noticed the report of a single case in which the growth appeared on the gums.

The fact that leptothrix is often found in the growths is not sufficient evidence that the fungus is the production of leptothrix. Considering the frequency of leptothrix, it would be strange if it was not often found with the fungus. In my own examinations I found leptothrix, but the common and constant bacillus was of a different form—longer and much more slender. Leptothrix cells measured were seldom over 3 mm. long, but the bacillus of mycosis was much longer. Those measured varied in thickness from ·4 mm. to ·56 mm., and in length they generally averaged about 5 mm., but a few were found 16 mm. When I used the compound tincture of iodine as a staining reagent, the cells were broken up into much shorter ones. An idea of the relative appearance of the bacillus and leptothrix may be obtained by comparing Figs. 1 and 2 with 3. With the aqueous solution of iodine and potassium iodide some of the cells became blue. How constant that reaction was I am uncertain, as I made but few observations with that stain.

The bacilli do not show a tendency to form long threads, but often lie parallel. They do not form spirals as is often seen in the cladothrix, but they do sometimes bend, even in some cases forming almost an ellipse. (*See* Figs. 1 and 2.) Generally they are quite straight.

Have the bacilli the power of locomotion? I suspect so. I did not see them move, but I frequently noticed that a freshly prepared specimen had the bacilli in a different arragenment from that shown in the same slide a few hours later. Soon after mounting one of my latest specimens in balsam, I found a beautiful field, in which there were a large number of the bacilli lying close together in a large bundle. After examining them for a time I was called away. Before leaving I made sure that this fascicle was in good focus and in the centre of the field. No one had access to the room except myself, but I have never since been able to find that bundle of bacilli.

Since the bacilli do show a tendency to form fascicles, until I find that they do not conform to Sadebeck's description I shall continue to call them bacilli fasciculati.

[31] "New York Medical Journal," 1889, p. 148.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

Pharyngeal actinomyces and aspergillus are more rare. For a description of each I would respectfully refer to text-tooks on bacteriology. Sarcinica are easily recognized by their cell division—round cells splitting into four, and each of these into four more. While they are undoubtedly found in the throat it may be a question if their residence there may not be secondary, as the result of stomach disorders. There is good reason for believing that when aspergillus is found in the throat, it has reached that location through the Eustachian tube from the ear. It has also been found in the lungs.

Etiology.—The etiology of pharyngo-mycosis is decidedly uncertain. There seems but little doubt, however, that catarrhal inflammation is a predisposing cause, furnishing suitable ground for the cultivation of the fungus. Mouth-breathing, a frequent accompaniment of catarrh, brings the air directly upon the tonsil without being filtered by the nose. This was present in my case to a moderate degree. It has been noticed as a sequel to rheumatic amygdalitis. A hypertrophied tonsil is especially liable to be the seat of the fungus. It is much more frequent in females than males, perhaps because they are more confined, and so have less pure air. Solis-Cohen's case occurred in an insalubrious locality, surrounded by diphtheria. Other observers have mentioned damp walls and surroundings as favourable for the growth of the fungus. I know of no investigations which show how or where the germ originates. The resemblance of the bacilli to several forms found in water, especially in water from marshes, suggested to me the possibility of such a course of infection. The home of my patient, and her temporary place of residence here, are in healthy communities. Lennox Browne[3] mentions an unhealthy skin, as from the use of cosmetics, as a cause of pharyngeal mycosis, but such a cause must be very remote, simply predisposing to pharyngeal congestion. On the leptothrix theory of mycosis, dental caries has been mentioned as a cause.

Symptoms. — The subjective symptoms of pharyngo-mycosis vary from a very slight tickling sensation to a decided feeling of obstruction. Sometimes nothing is felt. At other times a decided local inflammation is produced, accompanied by the usual symptoms of tonsillitis or pharyngitis, such as pain, fever, etc. The irritation of the fungus frequently produces a hacking cough, sometimes associated with vomiting. The voice is sometimes slightly altered. Constitutional disturbances, if felt at all, are secondary results of the tonsillitis. Asthma is sometimes present.

Objectively, we see spots upon the pharyngeal wall, or around the circumvallate papillæ of the tongue. These spots vary in colour from white to cream or yellow. When circumscribed upon the tonsils they are seen to grow from the crypts. They are very tenacious, not easily torn off, and when removed by the forceps they are rapidly reproduced in the same locality, sometimes within twenty-four hours. Generally the growth is in the form of filaments or tufts, sometimes confluent in a form of membrane. Normally the mucous membrane around the fungus is natural in colour.

Mycosis is differentiated from diphtheria by its chronic nature ; by less tendency for the fungus to spread ; by absence of fever and symptoms of systemic disturbance (except when accompanied by tonsillitis) ; by

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

absence of the diphtheritic odour; by absence of pain; and by the form of the fungus. When in the membranoid form it does not come off as a membrane, but breaks in pieces. When removed it sometimes leaves bleeding spots, but the mucous membrane is not so much denuded as in diphtheria.

In follicular pharyngitis the contents of follicles are easily expressed. The calcareous concretions sometimes found in chronic follicular amygdalitis often project from the crypts, but they also are easily expressed. Though in follicular inflammations the accumulations frequently *contain* leptothrix threads, they are not composed of the filaments. The only sure method of diagnosis is by the use of the microscope.

Prognosis.—The affection is more troublesome than dangerous. It is peculiarly annoying on account of the liability to frequent attacks of acute amygdalitis. The fungus is slowly destructive of the tissues on which it grows. In E. Fränkel's case the bacilli penetrated the tonsil some millimètres. Spontaneous cures sometimes occur, but usually the trouble is chronic, the fungi appearing in successive crops. The fungus may be implanted upon the nasal mucous membrane, or in the lungs. Located in the bronchial tubes the fungus might easily produce an extremely annoying bronchitis. The same result might follow as a result of the coughing from pharyngeal irritation. The cure of bronchial or pulmonary mycosis is a practical impossibility, except by surgical treatment.

Treatment.—The only successful and certain treatment is the thorough use of the thermo or galvano-cautery. There are obvious objections to the former. It has been stated that the bacillus thrives best in an acid medium. If this be true the use of the positive galvanic pole, with a large negative cutaneous electrode, should be more efficient than the galvano-cautery ordinarily used. Added to the local cauterization we then have the antacid action and the deep tonic effect upon the tissues.

Semon[16] claims to have cured his case with chlorate of potash and tannic acid, and Siefert [20] cured his with a gargle of sodium borate and ice. These results are so different from those of others that their diagnosis is questioned. Miller [32] says: "The strongest antiseptics do not exert the "least influence on the course of the disease." Vanderpoel[33] testifies: "I have not obtained any results from the use of the bichloride or of carbolic or acetic acids, and only partial success from applications of "chromic acid fused on a stick." Newcomb [34] reports: "Alum and "sulphur are useless. Silver nitrate answered well in two cases which "were especially tolerant to its use, but a relapse occurred six weeks "later." Ferric salts have been useless. Smoking is said to have cured one case.[34]

The two photographs here presented, though far from perfect, may aid some investigator. Both are taken with the heliostat, with 15 sec. exposure; freshly mounted, moist, using aniline red as staining reagent. The method failed to give as accurate definition as might be desired. The use of sunlight, combined with the wet mount, makes the bacilli appear much thicker than they are in proportion to their length.

[32] "N.Y. Med. Journ.," 1889, p. 334. [33] Op. cit., p. 148. [34] Op. cit., p. 234.

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press



Fig. 4.
Bacillus fasciculatus from Pharyngo-mycosis. $\frac{1}{12}$ Wales objective. Plate 6 ft. distant. Sunlight, 15 seconds.

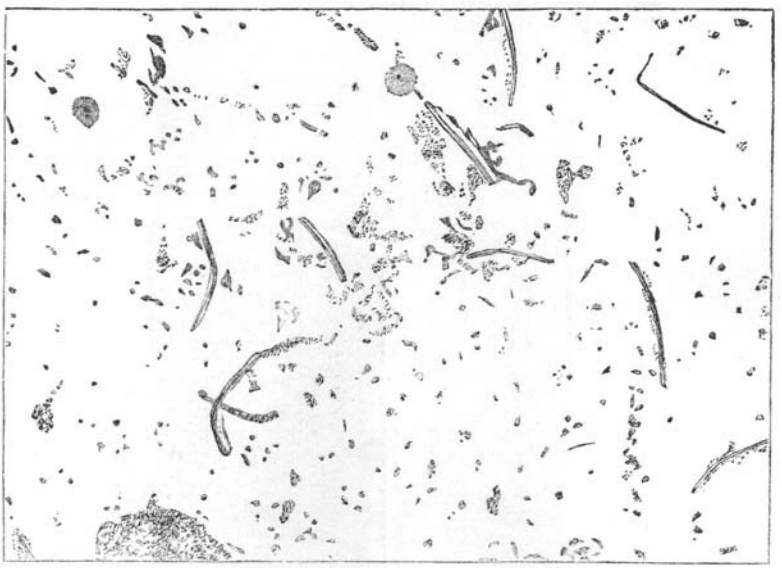


Fig. 5.
Bacillus fasciculatus from Pharyngo-mycosis. $\frac{1}{12}$ Wales objective. Plate 6 ft. distant. Heliostat time, 15 seconds.

[Note.—In the discussion following the reading of the paper, Dr. George Webster, of Chicago, mentioned a case then under his care. It

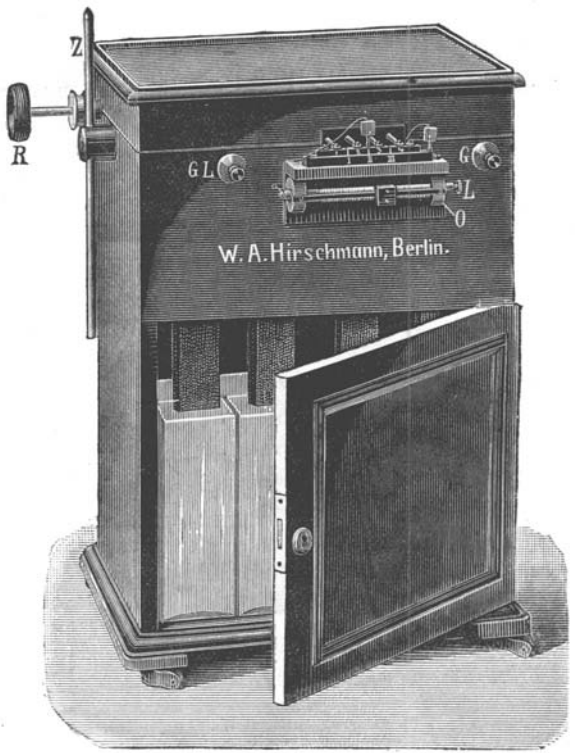
https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press

was that of a law student. When first seen the tonsils, entire pharynx, and even the epiglottis were covered with the microphyte. Many of the growths were over half an inch in length. Dr. Webster excised the tonsils, and by the aid of the galvano-cautery, combined with the hypo-sulphide of sodium, he is slowly conquering the growth.]

THE ELECTRIC LIGHT IN ANTRAL DISEASE, ETC.

By WILLIAM ROBERTSON, M.D., Surgeon Throat and Ear Hospital, Newcastle-on-Tyne.

AN account of the two following cases of antral disease reported before the Newcastle-on-Tyne Clinical Society, with special reference to and emphasizing the efficiency of the electric light as a ready and reliable diagnostic measure in antral disease, may not come amiss, more especially now, when it seems to be acknowledged that antral disease exists in



a latent form much oftener than has hitherto been supposed—*e.g.*, Gradenigo (JOURNAL OF LARYNGOLOGY, Nov. 1891, p. 468) found on

https://doi.org/10.1017/S1755146300161682 Published online by Cambridge University Press