ELKINS- SUE NEAL: Determining the Relationship of Certain Venereal Diseases to Speech and Hearing Pathology. (1967) Directed by: Dr. Lawrence M. Vanella pp.33.

A review of the literature from 1923 to 1967 was made in an effort to determine the relationship of venereal disease to speech and hearing disorders. It was found that until 1943, disorders of speech and hearing due to syphilitic infection were not uncommon. It was at this time that penicillin was introduced, and the incidence of speech and hearing defects caused by syphilis dropped considerably. However, in recent years there has been an upsurge in venereal disease, and although considered a clinical rarity today, the possibilities of speech and hearing disorders related to syphilitic infection should be considered in total diagnostic evaluations.

DETERMINING THE RELATIONSHIP OF CERTAIN VENEREAL DISEASES TO SPEECH AND HEARING PATHOLOGY

by

Sue Neal Elkins

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INTRODUCTION

The venereal diseases are a group of diseases currently thought to be transmitted through intimate contact with an infected person. Throughout their history, the diseases have afflicted the populace in varying ways. The field of speech and hearing alone has revealed certain pathological disorders attributed to venereal disease infection. There are five venereal diseases: syphilis, gonorrhea, chancroid, lymphogranuloma venereum, and granuloma inguinale.

Gonorrhea (clap), caused by Neisseria gonorrhoeae, is of worldwide distribution and has the dubious distinction of being the most prevalent venereal disease. It is characterized by nonspecific mucopurulent (see glossary) inflammation, principally of the genital mucosal surfaces, with occasional septicemic involvement of the meninges, joints, and endocardium.

Chancroid (soft chancre) is caused by Hemophilus ducreyi; it occurs for the most part in persons who seldom bathe. Its principal manifestation is multiple genital ulcers (often painful), associated in the later stages with infection of the inguinal lymph nodes.

Lymphogranuloma venereum is caused by an agent variously classified viral and rickettsial. The histologic

reaction is characterized by a granuloma with central suppuration, best seen in the lymph nodes.

Granuloma inguinale is caused by a bacterium known as Donovania. "The disease is worldwide in distribution, although most common in the poor people of the tropics."[1] The histologic reaction is granulomatous, and genital ulcers, often large, are characteristic.

In this study, we will primarily be concerned with syphilis and its relationship to speech and hearing disorders. This narrowing of interest was dictated by the pausity of information concerning the remaining venereal diseases and their relationship to speech and hearing pathology.

Syphilis, sometimes called lues or the great pox, is caused by the spirochete, Treponema pallidum. This organism is an anaerobic human parasite which causes granulomatous inflammation involving chiefly the small blood vessels. In some cases, this inflammatory process is accompanied by degeneration which may appear in any tissue or organ.[2]

Syphilis may be of two general types: acquired or congenital. In acquired syphilis, the infection may be primary, secondary, or tertiary, depending on the time

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[1]Morehead, Robert P., Human Pathology (New York: McGraw-Hill Book Company, 1965), p. 1503.

[2]Ibid., p. 38.

interval between the onset of symptoms and the initial infection. In primary syphilis the characteristic lesion is a hard, painless chancre, and it may occur wherever the treponeme first enters the body. It is usually single, but may be multiple; the lesion, too, may heal eventually without therapy, but the disease will continue its course.[3]

Secondary syphilis develops in the patient within two to twelve months after the appearance of the chancre. It is the most contagious stage of the disease, and individual patients may exhibit widely varied clinical manifestations. Although symptoms such as fever and sore throat are often present, diagnosis is made primarily on the basis of lesions of the skin and mucous membranes. Mucous patches of the mouth and throat are frequently seen in secondary syphilis.[4]

Tertiary syphilis does not always follow the first two stages. When additional evidence of the disease does develop, however, it is after an interval called the latent period which follows the secondary stage two to four years in most cases, although the period may vary from a few weeks to thirty or fourty years. When late lesions do develop, they affect principally the cardiovascular and

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[3] Notes on Modern Management of VD, U. S. Department of Health, Education, and Welfare (Washington: Government Printing Office, 1962), p. 4.

[4] Ibid., p. 5.

nervous systems.[5]

All the preceding sections have described syphilis in a host who was born free of the disease--the form usually referred to as acquired syphilis. Infections acquired *in utero* (congenital syphilis) have a somewhat different clinical course and appearance. Early congenital syphilis is similar to secondary syphilis, but often more severe in its manifestations. It may be highly infectious, affecting children under two years of age. The histologic appearance of the lesions does not differ from that of the lesions of acquired syphilis, but the sites of principal involvement are not the same. Eighth nerve deafness, neurosyphilis, and gummata of the skin, bones and viscera may be observed in congenital syphilis. The gummatous lesions may at times lead to perforation of the nasal septum and/or the palate.[6]

Syphilis, as we know it today, probably first appeared in Europe in the fifteenth century.[7] It swept the entire continent in a relatively short time, killing and crippling literally millions of persons. Syphilis is said to have appeared in France, Germany, and Switzerland in 1495; in Holland and Greece in 1496; in England and Scotland in

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[5]Morehead, *op. cit.*, p. 382.

[6]*Notes on Modern Management of VD*, U. S. Department of Health, Education, and Welfare (Washington: Government Printing Office, 1962), p. 7.

[7]Fleming, William L., "Syphilis Through the Ages," *The Medical Clinics of North America* (Philadelphia: W. B. Saunders Company, 1964, p. 587.

1497; and in Hungary and Russia in 1499. Everywhere the disease was regarded as new and names for it appeared which attempted to shift the responsibility for it to others. "'The Italians called it the Spanish or French disease; the French called it the Italian or Neopolitan disease; the English called it the French disease; the Russians called it the Polish disease; the Turks called it the French disease'."[8]

During the sixteenth, seventeenth, and eighteenth centuries, the development of knowledge of syphilis continued rapidly. One problem however, was the confusion of gonorrhea and syphilis. Some syphilographers considered the two the same; others refused to accept this.

After the eighteenth century, the treponeme seemed to somewhat become less virulent, but syphilis continued to be a threat throughout a good part of the twentieth century.

According to demographical studies, syphilis appears to have established a pattern or trend of incidence. There was an expected upsurge in the incidence of syphilis during World War II, with the peak incidence of reported primary and secondary syphilis cases being reached in 1947. Following this, there was a sharp decline in the incidence of syphilis, reaching a low point in 1954.[9] In 1959, reported incidence rose rapidly again, and has continued until the

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[8] Ibid.

[9] Ibid., p. 608 .

present.

Due in part to the aforementioned pattern of incidence of syphilis, and in part to medical findings, there have been many changes and advances in treatment or therapy since the disease was first described in the early sixteenth century. Mercury and the iodides formed the mainstay of treatment for three centuries. It was used in every possible manner, but on the whole was unsuccessful in eliminating the dreaded infection. At the beginning of the twentieth century, salvarsan was introduced by Erlich and although effective, severe tissue necrosis at injection sites limited its usefulness.

Bismuth compounds were introduced in the early 1920's and soon the standard treatment of luetic infection was arsenical-bismuth combinations.

Penicillin was introduced in 1943, and this marked the beginning of a new era in the control of all forms of luetic infection.[10] However, there still existed certain strains of the pathogen which displayed resistance to penicillin. In addition some persons are allergic to the drug and react violently if subjected to it. Thus, alternative treatment for syphilitic infection, e.g. erythromycin and/or tetracycline, has been propounded.[11]

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[10]Karmody, Collin S., et al., "Deafness in Congenital Syphilis," Archives of Otolaryngology, 83:24, January, 1966.

[11]Youmans, John B. (ed.). The Medical Clinics of North America (Philadelphia: W.B. Saunders Company, 1964), p. 814.

AUDITORY DEFECTS RELATED TO SYPHILIS

The field of speech and hearing pathology has revealed certain auditory disorders directly attributed to venereal disease infection. In 1925, syphilitic involvement of the acoustic nerve was considered frequent with reported cases of atrophy of peripheral nerve endings. In addition, the cochlea was often found to be filled with connective tissue, resulting from inflammatory changes within the labyrinth. Despite these observations, anatomical studies on the ear were still insufficient for the purpose of studying syphilitic ear involvement. As a direct or indirect result of aural changes, the degree of deafness was often varied.[12]

Deafness of syphilitic origin occurs principally in two forms: congenital syphilitic deafness, and recently acquired luetic deafness. Among these cases of sudden deafness where the etiology can be determined through exact examination, syphilis merits special attention. In part, the disease has decreased in frequency due to health measures and successful treatment; but on the other hand,

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[12] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, April, 1926), pp. 119-120.

syphilis still poses many puzzling problems.

It has been well established that lues cannot be inherited, but rather it is acquired before birth from a syphilitic mother. Some authors term this syphilis as "connatal."[13]

Gradual onset of hearing loss is much more frequent than sudden deafness, and women appear to be more frequently affected than men. Bilateral hearing loss is more frequent than unilateral, and most characteristic are the various dissociations of vestibular reaction.

Late connatal syphilis poses different problems. In contrast to most of the manifestations of lues which respond to penicillin, the nerve deafness of late connatal syphilis is refractory to such treatment and the interstitial keratitis behaves like a hypersensitivity phenomenon.[14]

The early diagnosis of this disease remains a problem. In cases of congenital lues, deafness is rarely an isolated symptom, but may be found associated with a keratitis parenchymatosa, or, in some instances, there may be malformed teeth.

Some authors emphasize that the condition is an affection of the connective tissue and not primarily a nerve

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[13]Arnold, Godfrey, and Katsuichire Ohsaki, "Two Cases of Sudden Deafness," Annals of Otology, Rhinology, and Laryngology, 72:606, September, 1963.

[14]Ibid.

tissue affection.[15] However, there may be controversy on this issue.

"Recent reports from most parts of the world show a definite progressive increase in the incidence of early syphilitic infection."[16] Reports have shown that there were 124,000 cases of syphilis reported in the United States in 1962.

In a study by Karmody, the findings of 123 cases of congenital syphilis were presented. These cases were seen at the Massachusetts General Hospital between the years of 1942 and 1964. From this study, Karmody concluded that, characteristically, the pattern of deafness in congenital luetics showed considerable variation both in time of onset, type of hearing loss, and rapidity of progression. Typically, it was sensorineural in type with a flat audiometric curve, with an added conductive element if the middle ear was involved.[17]

PATHOLOGY

The changes seen in the aural apparatus of individuals with deafness associated with congenital syphilis are degenerative due to toxic exudation into the labyrinth fluids, with fibrination resulting in degeneration of the

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[15] "Review of Hereditary Syphilis," Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, November, 1923), p. 24.

[16] Karmody, op. cit., p. 18.

[17] Ibid.

organ of Corti. Sometimes a secondary degeneration of the spiral ganglion and eighth nerve is observed. The pathological changes in the membranous labyrinth are secondary to lesions of the bony otic capsule, and if the vestibular nerve is also involved, the labyrinth will not respond to stimuli.[18]

Possible bony pathology is shown through extensive erosion of the otic capsule around the semicircular canals, over the cochlea, and even around the internal auditory meatus. The defects are usually filled with fibrous connective tissue which is heavily infiltrated by round cells of the chronic inflammatory type. There is usually fusion of the head of the malleus and body of the incus in the temporal bone. The changes in the labyrinth are cochlear hydrops and later degeneration of the sensory endorgans of both the auditory and vestibular systems.[19]

In 1939, Goodhill reported on certain pathology of aural lesions in acquired syphilis in which he explained that functional losses are due to atrophy of the neuroepithelial elements of the cochlear and vestibular systems. Lymphocytic infiltration of the cochlea and spiral ganglion represented gummata, and in some prenatal cases, vascular changes occurred. Thus, it follows that the chief

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[18] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, June, 1926), p. 181.

[19] Karmody, op. cit., pp. 22-23.

pathologic changes affect the blood supply of the inner ear, and the neural elements.[20]

SYMPTOMS

Syphilitic defects may supervene as late as forty years after the infection, though these defects are usually early. The typical symptom is marked shortening of bone conduction associated with intact auditory sense.[21]

Other symptoms may include noises in the ear, dizziness, boring and tearing pain back of the ear.

Krassnig in 1927 described the symptoms of internal ear disease as (1) restriction of bone conduction with or without restriction of the upper sound registers; (2) marked impairment of hearing for spoken word and noise, and (3) inability to perceive certain sound groups, most of which are marked in the later stages.[22]

The onset of deafness in childhood is usually very sudden, bilateral, profound, symmetrical, and unaccompanied by marked vestibular symptoms. By contrast, adult symptoms begin abruptly, but the result is a partial asymmetric, flat sensorineural-type hearing loss. This loss is frequently accompanied by poor speech discrimination and loudness

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[20] Arnold, op. cit., p. 607.

[21] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, April, 1926), pp. 119-120.

[22] "Syphilis of the Ear," Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, November, 1928), pp. 505-507.

recruitment which may be indicative of a cochlear lesion.[23]

Thus, from a review of the relevant literature, it is conclusive that syphilitic auditory defects do occur. Moreover, injury to the auditory nerves takes place, and in most instances, the neural damage is irreparable.

Hahn states that "the prognosis of neural deafness due to late congenital syphilis is poor, and successful therapy has rarely been observed; thus relentless progression to severe deafness has been the general experience."[24]

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[23] Karmody, op. cit., p. 19.

[24] Hahn, Richard D., "Treatment of Neural Deafness with Prednisone," Journal of Chronic Diseases, 15:396, June, 1962.

SPEECH DEFECTS RELATED TO SYPHILIS

The field of speech and hearing pathology has revealed certain speech disorders directly attributed to venereal disease infection.

Paresis: it has been reported that from one to five per cent of all syphilitics develop general paresis. General paresis is defined as a chronic psychosis which usually appears in middle life and is characterized by progressive mental deterioration. It is attended by paralytic symptoms due to gross changes in the central nervous systems. As a result, neurological symptoms include headaches and dizziness, perverted senses of taste and smell, disturbances in sensations, and difficulty in distinguishing between substances that are sweet, sour, salty, or bitter. In addition, the facial muscles become flaccid, the voice becomes monotonous and nasal; and speech is defective in that the patient stumbles over the usual test words and phrases (taken to mean phonatory and articulatory involvement). As the disease progresses, he begins to chew and thrust the tongue.[25]

Tabes dorsalis: this involves syphilitic degeneration

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[25] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, May, 1923), p. 152.

of the dorsal columns of the spinal cord, and it affects the laryngeal apparatus. Paralysis of the posterior cricoarytenoid muscles is often the first sign of this neurosyphilis, thus affecting the abducting of the vocal folds. It is usually unilateral, causing slight huskiness of voice. However, if both muscles are affected, tracheotomy becomes imperative. Complete paralysis of both vocal folds produces hoarseness, but does not interfere with breathing.[26]

Fien, Proctor, and Moore (1952) reviewed the subject of laryngeal manifestations of tabes dorsalis and reported eleven cases. They thought it possible that most laryngeal manifestations of tabes might be symptomless, and they doubted whether crisis--spasmodic cough, aphonic spasm, aponeic spasms--was likely to occur without paralysis. In only one of their cases was crisis present without paralysis, and in this case, the left vocal fold jerked spasmodically during quiet respiration. In four cases tracheotomy was necessary because of bilateral adductor paralysis.

These authors indicated that the lesion was probably located peripherally in the recurrent laryngeal branch of the vagus nerve.[27] Paralysis of the recurrent nerve leaves the larynx open and affects phonation but not respiration.

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[26] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, June, 1926), p. 181.

[27] King, Ambrose, Recent Advances in Venerology (Boston: Little, Brown and Company, 1964), pp. 63-64.

In contrast, paralysis of the dilators of the larynx leaves the larynx closed, and is thus accompanied by severe dyspnea. This paralysis of the dilators has been considered a sign of syphilis, often the only sign of an almost latent neural syphilis.[28]

Syphilitic pseudobulbar dementia: in this, the patient's voice may be high and nasal. Conversational speech may be rapid without modulation. The consonants are "poorly pronounced," but there is no dysarthria; sentences are spoken in one breath.

It has been observed in congenital syphilis that involvement of the larynx and chronic hoarseness often occur.[29] Laryngeal involvement may produce voice quality changes from husky to hoarse, and phonatory changes from bleating to aphonia.

Fifteen per cent of syphilitic patients show laryngeal involvement at autopsy. Secondary manifestations occur in the form of erythema or mucous patches, and they may appear from a few weeks to two years after infection. The appearance of the erythema is similar to that seen in acute laryngitis. Mucous patches have been seen on the vocal folds, aryepiglottic folds, and arytenoids, but more

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[28] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, June, 1934), pp. 218-219.

[29] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, December, 1925), p. 368.

frequently, they are found on the lingual surface of the epiglottis. Tertiary lesions are most frequently seen in the larynx, and they occur in the form of gumma, ulceration, and perichondritis.[30]

Gummatous tumors may appear anywhere in the mouth. Gumma of the hard or soft palate is not uncommon, and this can be dangerous if not checked in time.

Once the gummatous ulcer is formed, it destroys all infiltrated tissue lying in its path. Bone and cartilage offer no barriers. Extensive destruction may include large portions of the roof of the mouth.[31] (See Figs. 1 and 2).

Ulcerations of tertiary syphilis tend to destroy the cartilages of the larynx. It may occur on the mucous membrane, the vocal folds, or in the laryngeal musculature. In any case, the form is destructive.

Non-ulcerative laryngitis: this may also occur, involving all the tissues within the larynx. The symptoms are hoarseness, slight pain over the larynx, gradually increasing dyspnea, the voice finally being reduced to a whisper. Laryngoscopic examination reveals a stenotic larynx, livid mucous membranes, and thickening of the intralaryngeal tissues. Rapid edema of the glottis is likely to occur at any time. (See Fig. 3).

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[30] Venereal Disease Information, U. S. Public Health Service (Washington: Government Printing Office, February, 1926), p. 56.

[31] Keyes, E. L., The Venereal Diseases (New York: William Wood and Company, 1880), p. 169.

The ulcers may start on the surface of the pharynx and eat in, or a gumma may form beneath the perichondrium of a laryngeal cartilage and eat out. If present, the ulcers are visible with the laryngoscope, and the symptoms are those of intensified chronic laryngitis.[32]

As seen in the Vanderbilt University Hospital Syphilis Clinic, the most frequent gummatous diseases of structures of the mouth and throat were in the areas of the soft palate, tonsillar fossa, and posterior pharyngeal wall. Involvement of the hard palate is not uncommon, and perforation is the usual outcome. This gummatous infiltration is responsible for the complaint of chronic sore throat; the symptoms being characterized by difficulty in swallowing rather than actual pain.[33]

Syphilitic esophagitis: syphilis involving the esophagus has been reported infrequently, but because of the recent increase in venereal disease, it is felt by many that attention should be directed to the clinical problems which might be anticipated.

Dysphagia is the most common symptom in tertiary luetic esophagitis. Pain is non-existant, and weight loss is marked. The upper one third of the esophagus is most

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[32] Ibid., pp. 191-192.

[33] Youmans, John B. (ed.). The Medical Clinics of North America (Philadelphia: W. B. Saunders Company, 1964), p. 679.

commonly affected, usually involving the larynx and hypopharynx.[34]

Aphasia: in an analysis of forty-two cases, the incidence of symptoms and signs of aphasia due to cerebral vascular syphilis was thirty-one per cent (thirteen cases). Eighth nerve palsy showed up in three cases (seven per cent).[35]

Neurosyphilis: in paretic neurosyphilis, the most frequent neurologic signs are pupillary abnormalities, paralytic facies, tremors, speech and handwriting disorders, and change in the tendon reflexes. The disorder of speech, however, is probably the most characteristic sign of paretic neurosyphilis. In many cases, a diagnosis is possible after hearing only a few words spoken, and faulty enunciation is likely to be the first defect. The patient may slur consonants, especially when excited or talking rapidly, as in cluttering. Later the articulation becomes less and less precise. Not only is imprecision of articulation noticeable, but voice tremor may also be evident. Letters and syllables are elided, words are mispronounced, and the voice breaks. In some instances, these speech disorders are best perceived in spontaneous verbilization; in other instances, only a repetition of difficult test phrases will

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[34]Stone, John, "Obstructive Syphilitic Esophagitis," JAMA, 177:711, September, 1961.

[35]Merritt, H. Houston, et al., Neurosyphilis (New York: Oxford University Press, 1946), pp. 207-209.

bring out the defect. Many times, aphasic disturbances are added to these dysarthric difficulties, and the result may range from an occasional inability to name objects to a complete or global aphasia.

The paretic's handwriting may be very suggestive of the diagnosis. One notes poor judgement in regard to proper spacing of words, misspelling, transportation, and emission of letters.[36] (See Fig. 4).

In many instances, the symptoms of tuberculosis, syphilis, and cancer of the larynx have been confused. The chief subjective symptoms of these maladies are hoarseness, pain, and dyspnea. Hoarseness may be lacking entirely in syphilis unless inflammation has extended to the vocal folds causing swelling, ulceration, or scars. Hoarseness is often the first sign of cancer of the larynx. In tuberculosis, hoarseness appears in varying degrees and forms according to the location and extent of pathologic changes. Pain is usually extreme in tuberculosis, but very slight in cancer and syphilis. The larynx is less erythematous in tuberculosis than in syphilis, and fever is usually present. With no complications, fever is usually absent in syphilis of the larynx, as well as in cancer of the larynx.[37] Dyspnea

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[36] Ibid.

[37] Venereal Disease Information, U.S. Public Health Service (Washington: Government Printing Office, October, 1934), p. 332.

usually occurs in syphilis of the larynx at an advanced stage, especially if there is extended edema.

Thus, from a review of the literature it is concluded that syphilis can attack the laryngeal mechanism in various forms producing certain defects which either directly or indirectly affect speech. Even though syphilitic laryngitis is looked upon as a clinical rarity today, its possibility should be considered in the total diagnostic procedure and rehabilitative endeavor. Possibilities for latent effects should also be considered.

CONCLUSIONS

The primary purpose of this study was to determine the relationship of venereal disease, especially syphilis, to speech and hearing disorders. In reviewing the literature, there seems to be no question that at certain times in the history of man, venereal disease, especially syphilis, has caused widespread destruction of man's speech and hearing apparatus. The advent of penicillin was probably the most important single contribution to the control and treatment of syphilis, and yet there are still certain strains of the pathogen which display resistance to the usually prescribed medications.

It is concluded that there are varying degrees of the venereal diseases, depending on: time of entry of organism, type of treatment administered, and the pathogenic organism itself. In syphilis, the condition may be acquired or congenital, and the onset may vary according to age. In view of the literature reported in this study, it is concluded that there exists a positive relationship between venereal disease, especially syphilis, and speech and hearing pathology. Laryngeal or auditory damage due to syphilis may be looked upon as a clinical rarity today; however, it has been shown that there has been a recent upsurge in the disease, and it is established that there is no immunology against venereal disease. Therefore the possibilities and indications of the venereal disease---

speech and hearing disorders relationship should be carefully considered not only in the total diagnosis but also in the treatment of the relationship. Areas of concern may be as follows: (1) evaluating voice; (2) evaluating articulation; (3) gathering of case history information; (4) checking medical reports; (5) gathering early developmental information.

The following audiological anomalies have been seen to be affected by syphilitic infection: deafness may occur as congenital or acquired, and the deafness is usually bilateral. The pathological changes are degenerative due to toxic exudation into the fluids of the labyrinth. Symtoms may appear as late as forty years after the infection, although the defects are usually early.

The literature reveals that syphilitic involvement has been associated with laryngeal anomalies: paresis, tabes dorsalis, pseudobulbar dementia, and neurosyphilis. Pathology shows gummata, ulceration, and perichondritis. As in deafness, the infection may be either congenital or acquired, and the chief symptoms are hoarseness, pain and dyspnea.

Due to recent advances in medicine, and particularly in venerology, the person acquiring venereal disease today has no excuse for ignorance. Yet, statistics verify that in North Carolina alone in 1966, gonorrhea and syphilis were ranked as the No. 1 and No. 2 communicable disease,

respectively. (See Table 1). Perhaps the emphasis should not be on treatment, but on preventive measures which are in practice now, such as the following: (1) public school programs involving film series, group discussions, and lectures by medical personnel; (2) service-connected education endeavors, such as the showing of films during basic training; (3) health department programs involving the public as a whole.

While treatment of a disease is a medical essential, "prevention is usually better than cure." Syphilis and the other venereal diseases are not exceptions. In order to accomplish this preventive endeavor, educational methods may hold the key. One way, perhaps, for this to be forwarded is for Biology to be taught early in the educative process and units on Venereal Disease included in the curriculum. Biological teaching does not constitute sexual pedagogy, neither does the knowledge of biological facts protect from venereal disease. Never-the-less, this knowledge may form the background for the more serious duties imposed upon the school and church relating to the entire education of the young person.

The recent upsurge in venereal disease has posed new problems and new questions to public health centers, social welfare centers, and medical centers all over the United States. Research is needed to find the answers to these age-old problems. Since speech pathology and audiology

are directly involved, the possibilities, indeed obligations, for future research loom large.

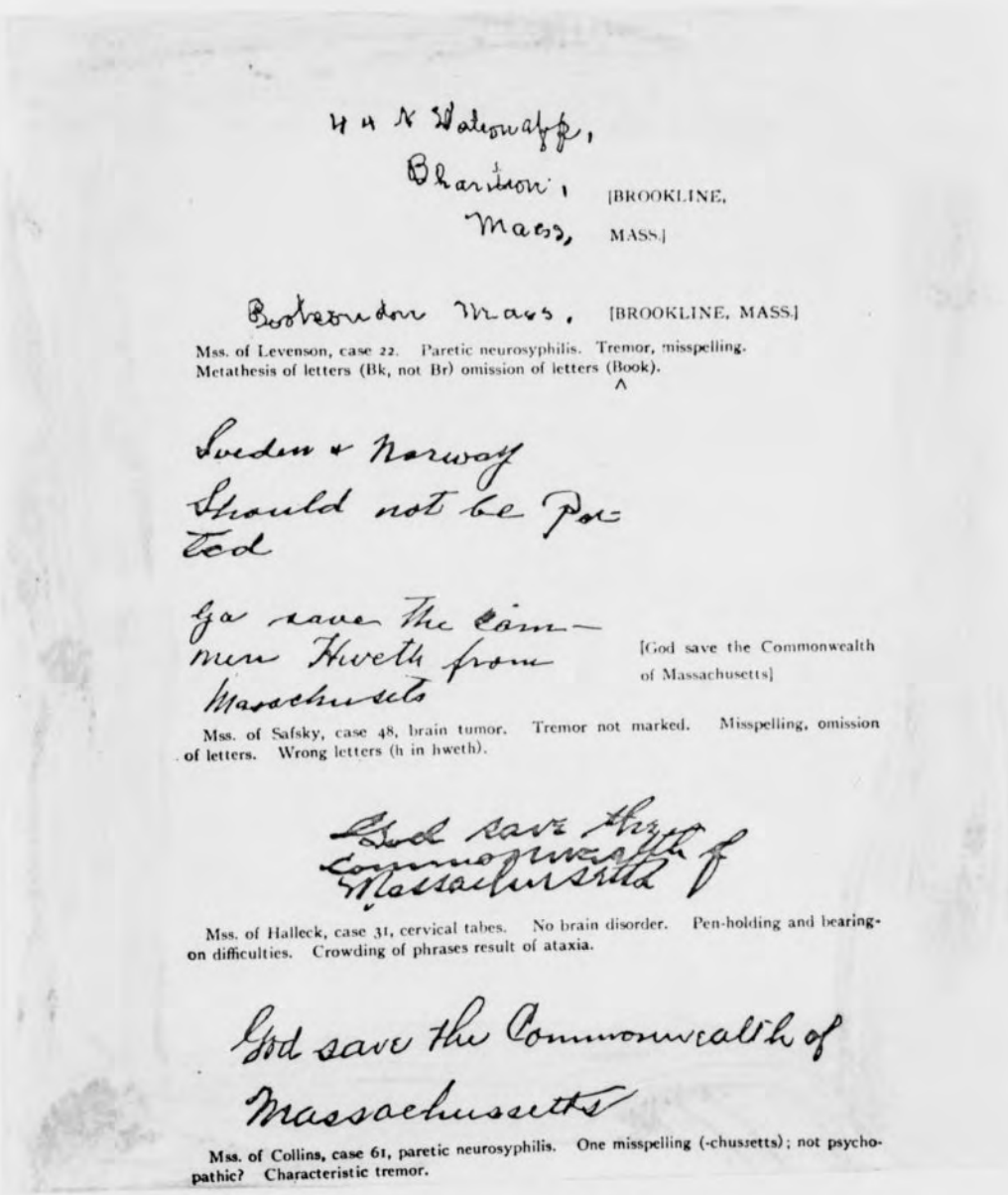
RANK	DISEASE	NUMBER OF CASES
1	Gonorrhea	12,944
2	Syphilis	2,025
3	Tuberculosis	1,327
4	Measles	819
5	Streptococcal Pharyngitis (including Scarlet Fever)	749
6	Salmonellosis (including Paratyphoid fever)	451
7	Hepatitis (infectious and serum)	410
8	Food Intoxication	174
9	Shigellosis	152
10	Meningococcal Infections	135
11	Other Venereal Disease	118
12	Whooping Cough	59
13	Malaria	51
14	Aseptic Meningitis	44
15	Encephalitis	32
16	Rocky Mountain Spotted Fever	24
17	Amebiasis	21
18	Typhoid Fever	5
19	Tetanus	4
20	Diphtheria	2
20	Brucellosis (Undelant Fever)	2
22	Tularemia	1
22	Psittacosis	1
22	Trichinosis	1

Table 1. Reported communicable diseases, North Carolina, 1966.

Fig. 1. Syphilitic destruction of the palatal bones.

Fig. 2. Large perforation of the soft palate following gummatous ulceration.

Fig. 3. Gumma of the larynx.



H H N Walowaff,
Brookline,
Mass,

[BROOKLINE, MASS.]

Brookline Mass, [BROOKLINE, MASS.]

Mss. of Levenson, case 22. Paretic neurosyphilis. Tremor, misspelling. Metathesis of letters (Bk, not Br) omission of letters (Book).

Sweden + Norway
Should not be Pro-
tod

Ga save the Com-
mon Hweth from
Massachusets

[God save the Commonwealth of Massachusetts]

Mss. of Safsky, case 48, brain tumor. Tremor not marked. Misspelling, omission of letters. Wrong letters (h in hweth).

God save the
commonwealth of
Massachusetts

Mss. of Halleck, case 31, cervical tabes. No brain disorder. Pen-holding and bearing-on difficulties. Crowding of phrases result of ataxia.

God save the Commonwealth of
Massachussetts

Mss. of Collins, case 61, paretic neurosyphilis. One misspelling (-chussetts); not psychopathic? Characteristic tremor.

Fig. 4. Paretic neurosyphilis, specimens of handwriting.

GLOSSARY

apnoeic--the transient cessation of the breathing impulse that follows forced breathing.

chancre--the primary lesion of syphilis developing at the site of entrance of the syphilitic infection and appearing as a small papule which erodes into a reddish ulcer covered with a yellowish exudation.

cochlear hydrops--the abnormal accumulation of serous fluid in the tissues of the cochlea.

congenital--existing at, and usually before, birth.

erythema--a morbid redness of the skin of many varieties, due to congestion of the capillaries.

fibrination--the acquisition of an abnormally large amount of fibrin.

fibrin--a whitish, insoluble protein formed in the clotting of blood.

granulomatous--composed of tumors or neoplasms made up of granulation tissue.

gumma--a soft, gummy tumor occurring in tertiary syphilis, made up of tissue resembling granulation tissue.

hypersensitivity--a state of altered reactivity in which the body reacts to a foreign agent more strongly than normal.

inflammation--the condition into which tissues enter as a reaction to injury.

interstitial keratitis--a chronic variety of inflammation of the cornea with deep deposits in the substance of the cornea. The disease is associated with congenital syphilis, and occurs in children before the fifteenth year. Called also keratitis parenchymatosa.

lues--syphilis.

lymphocytic--pertaining to a variety of white blood corpuscles which arise in the lymph glands.

mucopurulent--containing both mucous and pus.

perichondritis--inflammation of the membrane which covers the surface of a cartilage.

pseudobulbar dementia--a general designation for mental deterioration apparently due to a bulbar lesion. (bulbar refers to the medulla oblongata.)

suppuration--the formation of pus.

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