

SCARLET FEVER.

Synonyms.—Scarlatina; Scarlet Rash.

Definition.—Scarlet fever, or scarlatina, is an acute contagious disease of childhood, characterized by a bright, scarlet-colored, punctiform eruption, diffused over the entire body; by an angina more or less severe; by a fever so variable in character that it may only be detected by the thermometer, or so severe as to rapidly destroy life, the thermometer registering higher in this than in any other fever; and by a marked tendency to nephritis, the disease finally terminating' by desquamation of the skin.

History.—The early history of scarlet fever is not very reliable, as it was for a long time regarded as a variety of measles, and the first definite and distinctive name that gave it as a separate and distinct disease must be credited to Sydenham, who carefully studied its characteristic features and clearly separated it from the other exanthemata.

Early writers—viz., those of the Italian school—may have used the term scarlatina, yet it is very doubtful if it was applied to this distinctive fever.

From the time of Sydenham, 1685, till the present, scarlet fever has prevailed, progressively increasing as the years have passed, until to-day it has become endemic in all the large cities of the world, while epidemics of varying severity have visited, from time to time, Europe and America.

The disease may occur sporadically or as an epidemic, and, though essentially a disease of childhood, no age is exempt. It is the most severe and fatal of all the exanthematous fevers. One attack renders the patient immune.

Etiology.—Ever since scarlet fever became isolated as a specific disease, the medical profession has been studying the nature of the poison, and yet the materies morbi has elusively escaped the search of the student.

For thirty years the bacteriologist has sought in vain for a micro-

organism as a cause of the contagion, and though several observers have found, what seemed at first, satisfactory evidence of a specific germ, closer investigations have revealed their mistakes.

Klein thought he had, discovered the poison to be due to a disease of the cow. An epidemic of scarlet fever broke out in London in December, 1885, and the outbreak could be traced to the milk supplied by a herd in Hendon. The cows were affected by a peculiar disease which he believed to be scarlet fever, and he discovered from the discharges that occurred from the ulcers on the affected cows, a micro-organism which he believed to be identical with the micro-organism which he had found in the blood of human scarlet fever patients.

C. B. Brown's investigation, however, showed that milk from other herds affected with the same disease did not cause scarlet fever, and that milk from the Hendon herd must have been contaminated by scarlet fever existing in the neighborhood. So of other animals that have conveyed scarlet fever, they have only been the media of conveying the disease from one person to another.

All that we know positively is, that there is a specific infection, that it is volatile, minutely divisible, and diffused so quickly that it spreads from one to another with marvelous rapidity.

It possesses great tenacity and vitality, and may reproduce itself in a favorable soil after lying for years. Thus Hildebrand's coat is said to have transmitted the disease eighteen months after it had been in contact with scarlet fever, while Boech reports a case in which two children of a physician contracted scarlet fever by playing with locks of hair which had been cut from the heads of two children who died from scarlet fever twenty years before, the hair having been enclosed in a drawer during the interim.

The infection is found in the expired air, the secretions and in the epidermis. It fastens itself upon the clothing, furniture, drapery, toys, letters, flowers, hair, in fact anything animate or inanimate that comes in contact with it. It may be carried in a letter written in the sick-room to one many miles distant. All that seems necessary to contract the disease is to come in contact, for ever so brief a period, with the impregnated air or body upon which the infection is found.

It is probably most contagious after the eruption makes its appearance

and during the period of desquamation.

Predisposing Cause.—*Age.*—While no age is exempt, it is essentially a disease of childhood. Infants are not so liable to contract the disease, although cases have been recorded where the child was born with it. The ages most susceptible are between two and eight years. After ten the susceptibility diminishes, very few indeed contracting the disease after reaching adult life.

The great value of isolation is thus seen; for if one can protect the child until he is ten years old, but little danger exists. Neither sex nor race seems to influence the predisposition. Social position seems to have but little influence, the rich and favored suffering alike with the poor.

Season.—Autumn and winter show a greater number of cases than spring and summer.

Wounds.—Open wounds, either accidental or surgical, increase the susceptibility to the poison.

Pathology.—There are no characteristic or specific changes to record, the changes which do take place in the viscera being the same as are found in all fevers of an intense character. The blood is dark, diffuent, and does not coagulate readily, owing to a defect in the fibrin.

Should death be delayed to an advanced stage of the disease, it is usually the result of septicemia, nephritis with dropsy, or the result of an endocarditis, pericarditis, or meningitis.

The eruption is due to the hyperemia of the skin during the dermatitis, and disappears after death, except in those malignant cases where the eruption failed to appear during life, and appears upon the death of the patient, confirming the diagnosis.

The change which takes place in the throat resembles that of simple inflammation, tonsillitis, or cynanche maligna. In some, only the superficial tissues are involved, as may be seen by the vivid redness, while in others the inflammation assumes a phagedenic character, dipping down into the deeper tissues, which, sloughing, reveal ragged and foul-looking ulcers. Extending to the deeper tissues of the neck, large abscesses may form. The cervical glands become involved in the malignant form, and occasionally suppurate, leaving ugly, cold

abscesses.

Where the angina is severe, there may appear early a membranous exudation, pseudo-diphtheria; but if the exudation does not occur for a week or ten days, it is usually true diphtheria with its attendant symptoms. The kidneys present the characteristics of acute nephritis or Bright's disease. (See Bright's Disease.)

Symptoms.—The symptoms of scarlet fever depend largely upon the form or variety. In some cases the disease is so mild as to require considerable skill in recognizing it, while in others it will be so severe as to destroy life in thirty-six or forty-eight hours. This great diversity of symptoms has led authors to divide the disease into three varieties: *Scarlatina Simplex*; *Scarlatina Anginosa*; and *Scarlatina Maligna*.

In some seasons the disease will prevail in the simple form, while another season will reveal all of the anginose form, or the epidemic may show the most malignant type.

Incubation.—The period of incubation varies from two to eight days, though the average time is from four to five days; but where the disease is intense it may not be over twenty-four hours. Prodromal symptoms are usually absent, though the child may show slight indisposition.

Invasion.—The invasion of the disease is sudden. Frequently the chill is the first evidence, followed by a high fever, and very grave symptoms are present in a few hours. Again in highly sensitive children a convulsion will mark the beginning of the disease. Either case is usually accompanied by vomiting. The pulse is very rapid, the temperature rapidly increases, and the child complains of great heat, which is pungent in character.

The angina very early develops, and, even where the child has not complained of pain, an inspection of the throat will reveal the fauces, tonsils, and uvula a vivid red, with considerable swelling and the sensation as though something was filling or obstructing the throat. In the simple form these symptoms are not so marked.

In twenty-four or forty-eight hours, though it may be delayed to the fourth day, the eruption appears upon the neck and chest, soon extending over the entire body. The exanthem consists of an infinite number of punctate points surrounded by an erythema that gives the

bright scarlet color from which the disease takes its name. There is no cessation in the fever with the appearance of the eruption, as in other fevers. The eruption remains from two to six days, gradually fading away, and is followed by a branny desquamation.

Anginosa.—Dr. Scudder has given so realistic a picture of this form that I will quote him in full: “In *S. anginosa*, the chill is usually marked; there is nausea and vomiting, pain in the head and back, thirst, etc. The fever which follows is intense; the skin is dry, husky, and burning; the eyes dry and painful; the face congested and tumid; bowels constipated; urine is scanty, frequently voided, high-colored, with marked irritability of the nervous system. Soreness of the throat is complained of from the first, with difficult deglutition, and, on examination, we find the fauces tumid and red and the tonsils somewhat swollen. The nares are frequently implicated with the angina, and there is consequently stuffing of the nose, with difficult respiration, and consequent increased restlessness.

“The eruption sometimes makes its appearance during the latter part of the first day of the fever, but, more frequently, not until the second or third day, and about the third or fourth day it has reached its height. At the commencement, there appears slight tumefaction of a portion of the surface, which gradually assumes a rose color, and the minute red points are developed. These patches increase in size until the greater portion of the surface is involved. During the eruption there is an expression of anxiety and suffering; the child is restless, uneasy, and sleepless, which resists the usual means of rest, is caused by the heat and stinging of the surface, and soreness of the throat.

“The throat affection is here the most prominent feature; the soreness increases, the mucous membrane and subjacent tissues are engorged and tumid, and the secretion from the mucous follicles and salivary glands is so viscid and tenacious as to cause great distress. In some cases ulceration commences by the fifth or sixth day of the disease, and the secretion is difficult of removal and exceedingly offensive; occasionally the ulceration assumes a phagedenic form, and speedily terminates the life of the patient. Frequently enlargement of the cervical lymphatics commences from the third to the sixth day, and, if not promptly treated, terminates in inflammation and suppuration.

“The fever, under appropriate treatment, commences to abate when the eruption has made its appearance, and disappears entirely by the

fourth or sixth day, when desquamation commences. As this progresses, the surface becomes paler, the epidermis exfoliating in whitish scales, or in large pieces where it is thick; sometimes desquamation is retarded for two or three weeks.”

Scarlatina Maligna.—Some seasons, for reasons unaccountable, scarlet fever appears in a malignant form. Such an epidemic occurred in the winter of 1879 in the little village of Harrison, Ohio, nearly every case resulting fatally, and this was my first introduction to scarlet fever. So intense was it, and so fatal in its results, that I have ever had a dread of this disease, and when scarlet fever appears, there rises before me a picture of that epidemic of 1879.

We may divide this variety into two forms,—the nervous, and the excessively toxic. In the first form the child is suddenly stricken; the chill is short and the febrile reaction extreme. The skin is intensely hot, dry, and pungent; the mouth is dry and parched; the eyes are brilliant and burning; the face is turgid; the head is hot and painful; the throat becomes dry, tumid, and swollen; the patient is restless and delirium early ensues. There is nausea and vomiting of a persistent character; convulsions are the rule.

Within twenty-four hours the intense excitement gives away to stupor. The child lies with the eyes partly open, the pupils are dilated, the surface seems dusky and swollen, the temperature reaches 104° to 105°, the pulse ranges from 160 to 170 beats per minute, and within thirty-six to forty-eight hours death ends the scene. In this case, if the eruption appears, it is a dingy red, and appears slowly, though the patient may succumb before it shows itself upon the surface.

In the second form, the disease is but little less fatal, though not so rapid. There is great prostration from the beginning. The chill is greatly prolonged, febrile reaction coming up slowly, the evidence of extreme sepsis being seen from the beginning. The child is dull and stupid, and the countenance vacant and besotted. The face is dusky or turgid and the heat of the body pungent, though the extremities are inclined to be cold. The tongue is broad and heavily coated, or dry and parched. Nausea and vomiting frequently occur, and diarrhea is common. The urine is highly albuminous.

The throat affection is characteristic; at first dry and tumid, it soon shows a dirty, moist exudate, so that it is not infrequently taken for

diphtheria. The deeper tissues become infiltrated, and a foul phagedenic ulceration is seen. The nares becomes involved, and an acrid secretion is discharged.

As the sepsis increases, a cellulitis develops, the cervical glands enlarge, the neck becomes greatly swollen, extending in some cases beyond the ears. The eyes are glued together with a brownish secretion, while the ears discharge the same characteristic material. The system seems to have more of the poison than it can carry, and the overflow escapes by way of the orifices.

The cervical glands suppurate, and a disgusting, pultaceous abscess is the result. The extremities become cold, the pulse is small, weak, and rapid, the mind is dull, coma comes on, and the child dies from toxemia.

The eruption, when it makes its appearance, is of a dull, dusky red color. Sometimes it appears as petechise, which, enlarging, form ecchymotic patches. At other times it appears the second or third day, only to remain a few hours, when there is a retrocession of the eruption.

Desquamation.—From six to ten days after the eruption first makes its appearance, desquamation begins. The eruption fades, the skin becomes dry and constricted and is shed in the form of dry, bran-like scales. Sometimes it comes off in large flakes or even in ribbon-like strips a foot or more in length, and in rare cases, where the epidermis is thick, like on the hand or foot, a complete cast of the member is shed.

Desquamation lasts from ten days to ten weeks.

Complications.—In scarlet fever, diphtheria, measles, and influenza, the middle ear is often affected by extension through the Eustachian tubes and the process may also affect the labyrinth.

In quite a number of cases the labyrinth is affected directly by the systemic poison, the middle ear escaping any morbid inflammation whatever. (Foltz.)

Respiratory Apparatus.—The inflammation may pass from the throat to adjacent parts of the respiratory apparatus, and bronchitis or bronchopneumonia may render the disease still more serious. Nephritis is a very common complication, though more frequently it is one of the sequelae.

Post Scarlatinal Nephritis is the most serious of all the results of scarlet fever. This may occur from the first to the fourth week after convalescence, though many times it comes on so insidiously that it is difficult to trace its beginning. Albumen is found in the urine, and the child is inclined to be dull and lifeless. The skin is dry and more or less constricted, the pulse small and wiry, the tongue dry and fissured, the face puffy, and the feet edematous. There is pain in the back and loins, the urine is scanty and high colored.

If the treatment be successful, the urine increases in quantity, is light in color, the skin becomes moist, and soon convalescence is established. In the graver cases, however, the dullness increases to coma, the pulse becomes small and feeble, the extremities are kept warm with difficulty, the temperature is sub-normal, the tongue is dry and brown, nausea and vomiting ensue, and diarrhea is not uncommon.

Hemorrhages may occur from the mucous surfaces, and muscular twitchings announce the approaching convulsion which often terminates the attack. During the course of inflammation of the kidney there is a tendency to cardiac changes. Dilatation of this heart, or endocarditis, or pericarditis may so weaken the heart that death may occur suddenly and when least expected.

Ear Complications.—One of the serious results of scarlet fever is deafness. The inflammation extending along the Eustachian tube is followed by suppuration and perforation of the membrane. A mastoid abscess is not infrequent. The patient may be left with a fetid discharge from the ear.

Diagnosis.—The diagnosis of scarlet fever is usually, readily made by the rose-colored efflorescence upon which are the innumerable small red points. The eruption is readily effaced by pressure, which leaves a white mark for several seconds before the redness is re-established. The characteristic sore throat and the strawberry tongue are also suggestive.

Belladonna produces a scarlatinal rash, but the history and absence of sore throat will enable one to avoid a mistake in diagnosis. It is distinguished from measles by the absence of catarrhal symptoms and by the irregular eruption commencing on the face and occurring in blotches.

Prognosis.—The prognosis will depend largely upon the character of

the epidemic, the previous health and age of the patient, and the complications which may attend the attack. Thus in scarlatina simplex, the prognosis will be favorable, every patient recovering, while the epidemic may show such intense malignancy that nearly every case may prove fatal. For example, in the winter of 1879 in the village of Harrison, Ohio, containing two thousand inhabitants, nearly every child who contracted the disease died. The prognosis is more unfavorable among infants, where nephritis occurs, and where there are cardiac changes. The older the patient the more favorable, the prognosis being just the reverse of measles.

Treatment.— *Prophylaxis.*—As this is one of the most contagious of all the eruptive fevers, and also the most serious, great care must be exercised to exclude the well members of the family. The child should be isolated and all intercourse with the patient prohibited. All upholstered furniture and unnecessary draperies, as well as carpets and rugs, should be removed from the sickroom.

The nurse should not mingle with the family, and all clothing worn by the nurse and patient, together with the bed linen, should be thoroughly disinfected before others come in contact with the sick-room. During the period of desquamation the patient may be anointed daily with olive-oil, after sponging with warm water and asepsin soap. The rooms should be thoroughly aired each day, care being taken that no draughts be allowed on the patient.

As a prophylactic, the members of the family who have been exposed may take belladonna, although it is questionable whether it possesses the virtue attributed to it as a preventive of the disease. Dr. Webster suggests “the use of echinacea as a prophylactic, or rather as an agent to fortify the blood against sepsis, the tissue against phagedena, and the cerebro-spinal centers against acute morbid changes.” The medical treatment for scarlet fever, like that for any other disease, depends upon the conditions present.

In mild cases the treatment is simple. Aconite and belladonna, of each five drops; water, four ounces, teaspoonful every hour. For local throat trouble use a gargle of chlorate of potassium and phosphate of hydrastine. Sponge the patient once or twice a day in warm alkaline solution, which carries off the surplus heat, renders the skin soft and pliant, and favors the eruption. If the child is restless, with flushed face, gelsemium will replace the belladonna. For the itching, nothing serves a

better purpose than the old, though crude, bacon-rind.

In scarlatina anginosa greater skill will be required. For the high grade of fever, to assist the sedative aconite or veratrum, the patient should be sponged frequently with warm soda-water. If the stomach will retain jaborandi, this agent will be found useful, one or two drachms to four ounces of water; teaspoonful every hour.

The throat affection is here the most prominent lesion. Cloths wrung out of hot water and vinegar and applied to the throat, over which a dry flannel should be placed, will be found of much benefit. The patient may also inhale the steam from vinegar and hops, which will give relief to the dryness of the throat.

Internally phytolacca and echinacea will be given. A gargle of potassium chlorate and hydrastis will also give relief, or a spray or gargle of echinacea may take the place of the potash. Where there is nausea and vomiting, with the characteristic strawberry tongue, or where the patient is restless and unable to sleep, rhus tox. will be found the best agent. Hydrochlorate of ammonia, in from one to three grain doses, is highly recommended by many, though I have never used it, and can not speak from experience.

In the malignant form of the disease, sepsis is the condition to overcome, and antiseptics will be especially indicated. For the dirty, moist, pasty tongue, a saturated solution of sodium sulphite, both internally and as a gargle, will be our best agent. If there be a foul breath, a cadaveric odor, I know of nothing that will equal potassium chlorate and hydrastis. Where the tissues are infiltrated and dusky, echinacea given internally, used as a spray, and applied to the neck, will give good results. Baptisia may be combined with the latter agent, as the action is similar. Where there is marked dullness, the surface dusky, and the eruption retarded, the old-time emetic of capsicum and lobelia will prove of great value. Where there is enlargement of the lymphatics, phytolacca, twenty to sixty drops to a half glass of water, will be the indicated remedy. Where the face becomes puffy and edematous, apocynum, ten to twenty drops in a half glass of water and a teaspoonful every hour, will give great satisfaction.

The nourishment must be fluid in character, milk being the best food when it can be taken. Great care must be taken during convalescence, the quantity of urine noted, and occasionally examined for albumin.

There are so many unpleasant sequelae following scarlet fever that the physician can hardly be too careful during this period.

SCARLET FEVER.—MEASLES.

Plate 13-14.



MEASLES.

Synonyms.—Moribilli; Rubeoli.

Definition.—An acute, infectious, and contagious fever, characterized by a general papular eruption, usually appearing the fourth day, and preceded by a catarrh of the mucous membranes of the bronchi, larynx, nose, and eyes.

Etiology.—The infectious material, whatever it may be, is found in the blood, in the secretions of the mucous membranes, and in the epidermic scales which are cast off. It is exceedingly volatile, and the presence of the unprotected in the near neighborhood is sufficient for the contraction of the disease. When once it enters the home, it usually infects all children who have not previously suffered from an attack. Unlike scarlet fever, the older the patient, the more severe the disease.

It usually occurs in epidemic form, though sporadic cases may occur. In

the larger cities it may be found more or less at all seasons of the year, and may therefore be said to be endemic. While a single attack is generally supposed to confer immunity, a second or third attack is not uncommon, the soil not being exhausted as in other exanthemata.

The attempt to isolate a specific germ which will produce the disease has thus far failed, though many micrococci have been found in the secretions.

Pathology.—There are no characteristic lesions in measles, save the catarrhal conditions of the respiratory apparatus. Where death occurs, it is usually the result of complications, capillary bronchitis, and bronchopneumonia being the most frequent. The other changes are common to those of grave fevers, such as lack of coagulability of the blood, which is dark in color. The internal organs are congested and softened. The lesion of the skin, consists of an acute hyperemia, with exudation in the vascular papillas of the corium, the sebaceous and sweat glands.

Symptoms.—The symptoms vary, being so mild some seasons that the child does not take to its bed. At other times the malignant character is manifest from the beginning", as seen by the characteristic septic symptoms.

Incubation.—From seven to fourteen days elapse from the time of exposure to the infection, to the first evidence of the disease, and is regarded as the period of incubation. During the time when the poison is at work upon the blood, multiplying itself a thousand-fold, the patient may manifest no symptoms of its presence.

Invasion.—The first manifestation of the disease is the presence of catarrhal symptoms. The child seems to have taken cold, and sneezes frequently. There is a watering of the eyes, stuffing up of the nose, with increased secretion and discharge of mucus. There is increased sensibility to light, hoarseness, and a dry bronchial cough. These symptoms may precede the chill twenty-four or forty-eight hours, or occur simultaneously in the cold stage.

Following the chill, febrile reaction comes up, but varies greatly, in mild cases scarcely noticeable, while in others the temperature reaches 103°, 104°, or even 105°. The skin is hot, flushed, and dry, the pulse hard and wiry, with marked irritation of the nervous system. The child is sensitive to the light, and intuitively screens its eyes from the glare. The cough is

a constant factor, and is hoarse or metallic and irritating. The fever is generally remittent in character, and increases to the third or fourth day, then, as the eruption makes its appearance, gradually declines.

The eruption first appears upon the face, forehead, neck, and chest, gradually extending over the entire body. The single point of the eruption is a flat or slightly conical papule (much the color of a mosquito-bite), growing quite irregular as it develops, while the color gradually shades to the sound tissue. They are inclined to coalesce in patches, though, where the eruption is profuse, it is confluent, every part being- affected. In these cases the face and tissues are puffy and swollen, the eyes are red and watery, the tongue is covered with a dirty, moist, pasty coating, and there is a peculiar and characteristic odor.

The eruption requires from forty-eight to seventy-two hours for its full development, remains from one to three days, and then gradually disappears, the surface being clear by the sixth or eighth day, though the skin may present a mottled appearance for several days after the disappearance of the eruption.

During the one, two, or three days the eruption is coming to the surface, the child will be quite sick, the fever active, the skin dry, the cough hard, dry, and almost incessant, attended by more or less dyspnea; with the full development of the eruption, however, the fever rapidly subsides.

Koplik's Spots.—For a day or two before the skin eruption, there frequently appears on the buccal and labial mucous membrane, small red spots with a bluish-white center, Koplik's spots, and are pathognomonic. Their value in diagnosis, however, has been overestimated as they are frequently absent.

Malignant Measles.—This is the so-called black measles, the surface presenting a dusky or dark purplish hue. This variety differs from the more simple form in the toxic character of the infection. Some seasons nearly every case partakes of this character, though why this difference the profession has not been able to explain, and we only know that the infectious material, having attained a high septic character, has the property of transmitting the same intense character to all infected. In one class of cases the eruption is tardy in its appearance.

The fever runs a pretty active course, with considerable bronchial

disturbance, the fourth, fifth, or sixth day passes without its full appearance. The surface becomes swollen and of a dusky hue, while the eruption can be seen indistinctly beneath the surface. The pulse is oppressed, the temperature 104° or 105°; the tongue is broad and thick, with a dirty, pasty coating; while the breath is peculiarly fetid; in fact, so characteristic is the odor that the physician could almost diagnose the disease, in the dark, by the odor alone.

The patient is dull, with the pupils of the eye dilated. The cough is hoarse and frequent, with more or less dyspnea. The eruption is darker in color than in the simple form, and the tissues seem edematous as though infiltrated.

”In another class of cases, the symptoms of malignancy are manifested early in the disease. The pulse is smaller and faster, the skin is flushed, but dry and dusky, and the tongue is covered with a dirty fur, with a tinge of brown. The nervous system suffers especially in these cases. In some there is great excitement for the first day or two, even delirium and sometimes convulsions, afterward coma. In the majority of cases, however, dullness and hebetude are marked symptoms; the child dozes with its eyes partly open, the coma gradually increases till the child can not be aroused. In all these cases the eruption is more or less dusky, or it may occur as petechial patches, and hemorrhage may occur from the various orifices of the body.

“**Retrocession.**—There may be retrocession of the eruption of measles at any time after it has appeared. In the milder form of the disease this increases the fever and the bronchial irritation, and, though unpleasant, is not dangerous. In other cases we will find the nervous system suffering severely from the retrocession, and, if it continues, the blood also becomes impaired. In these cases dullness, stupor, and coma follow one another rapidly; the skin is dusky, the temperature increased, the tongue becomes brown, and sordes appear upon the teeth. These symptoms are of a grave character, and unless prompt means are employed to bring the eruption again to the surface, it may terminate fatally in a short time.” (Scudder.)

Irregular Course.—While measles usually presents a uniform course and is readily diagnosed, we are not to forget that occasionally a case will present itself which is somewhat puzzling to the practitioner, owing to the absence of some one of the prominent stages. Thus, there may be an absence of the catarrhal symptoms, “Moribilli sine catarrho,” the

eruption appearing without the customary announcement; or these earlier symptoms may be present, suggesting measles, and yet no eruption appear, though the cough and catarrhal symptoms point to measles. This has been termed *Moribilli sine exanthemate*.

Complications and Sequelae.—Perhaps the most frequent and also most severe complication is that of some part of the respiratory apparatus. While a certain degree of bronchitis attends every case of measles, yet there may be an extension to the smaller bronchioles and a broncho-pneumonia result, or, in delicate children, a capillary bronchitis develop.

These complications usually occur among- debilitated children, and are recognized by the adventitious sounds; viz., the crepitant, followed by the subcrepitant rales. These complications, of course, add to the gravity of the disease.

Conjunctivitis.—This is not an uncommon complication. There is marked congestion of the conjunctiva, a high grade of inflammation is set up, suppuration occurs, giving rise to purulent ophthalmia. Granular ophthalmia tarsi is apt to result from this complication.

Catarrhal inflammation of the middle ear is one of the distressing complications, as it leaves a serious lesion behind. The inflammation is followed by suppuration and perforation of the membrane, deafness being a result.

Catarrh of the intestine is not an infrequent result, especially if an injudicious use of cathartics has been made in the beginning of the disease. Stomatitis is somewhat rare, though occasionally present, the inflammation extending to the throat.

Following measles, the child, debilitated by the combined forces which have been at work, falls an easy prey to the ravages of tuberculosis. The soil is ready for the phthisical germs, and their further development speedily follows.

Diagnosis.—The diagnosis of measles is usually readily made. It is recognized from scarlet fever by the longer period before the eruption, by the irregular and blotchy character of the eruption, the absence of sore throat, the presence of the bronchial cough, and the initiatory catarrhal symptoms.

From rubella, by the absence of the enlarged post-cervical lymphatics, the congested fauces, and the short prodromal stage and slight fever of the latter. From variola, by the shotlike character of the papules of the latter and their subsequent evolution.

Prognosis.—Measles is generally regarded by the laity as of little consequence, and something which every one must undergo, and the physician who has never passed through an epidemic of the malignant variety, or seen a serious complication, is prone to regard the disease of minor importance.

In all mild or uncomplicated cases, the prognosis should be favorable, but where the child is delicate, or has a feeble vitality, and the disease is attended by respiratory complication, or if it is of the malignant type, the prognosis must be guarded, though even here, if skillfully treated, the mortality should not be very large.

Treatment.—There are no prophylactic measures which can be said to be successful when an epidemic of measles makes its appearance in a community, and there are no means of hedging it in. It permeates the air, and the children contract the disease, though not necessarily exposed directly to a patient suffering from it; and while a few may escape by isolation, they are the exception.

To limit it as far as possible, the same precautions should be taken as in other diseases of infectious character; viz., the thorough disinfection of all the excretions, perfect cleanliness in the sick-room, a thorough disinfection of the sick quarters, together with the clothing of the nurse, upon the recovery of the patient.

The medicinal treatment of measles, unless complicated, is very simple. The child should be put to bed, even in mild cases, to avoid dangers which would arise from exposure. Sponge the surface with warm soda-water, and give the child a hot foot-bath. Internally, the small dose of aconite and asclepias will modify the fever and favor the eruption. Where there is restlessness and inability to sleep, or where the child cries out in the sleep, rhus tox. will replace the asclepias. For the initiative cough, drosera will be called for, drops ten to twenty in a half glass of water and given in teaspoon ful doses every hour.

The emetic powder on a larded cloth over the chest will be found

beneficial, not only in relieving the respiratory irritation, but also in hastening the eruption. Where the cough seems to arise from the larynx, as indicated by a tickling sensation in the throat, nitrate of sanguinary will prove efficient—a fourth or half grain of the nitrate to half a glass of water; or a small powder of the third trituration given hourly brings relief. Where the child has difficulty in breathing, and there is oppression of the pulse, give ten drops of lobelia to half a glass of water in teaspoonful doses every hour. If there be pain of a sharp character in the chest, bryonia will be the remedy, four drops to a half glass of water. Tartar emetic 2x or 3x is highly recommended by Dr. Webster.

In the severer form of measles, the child will need more careful attention. Specific medication, however, promises the best results, for though sepsis will be the chief condition with which we have to deal, experience has proven that every case can not be successfully treated by the same prescription. There seem to be different kinds or manifestations of the toxin, and by careful study we may meet these conditions with appropriate antiseptics.

When the eruption is tardy in making- its appearance, and the child's face is flushed and dusky, pupils dilated, the child is dull and passive, belladonna, ten drops to half a glass of water, will be the remedy. The older Eclectics obtained good results from the lobelia emetic, and it would be difficult to convince one who had succeeded by this means to trust the specific action of the small dose.

Where there is a broad, pallid tongue, with a dirty, white, moist, pasty coating upon it, nothing equals sodium sulphite given in from one to three grain doses every two or three hours. If the tongue presents a dry, sleek or glossy appearance, with redness of the mucous membrane, muriatic acid takes the place of the alkali. Where the breath is foul and the tongue is moist, with a yellowish coating, chlorate of potassium with hydrastine will be more effective than either of the above-mentioned remedies. Where the face is dusky, the tongue is full and thick, with duskiness of the mucous membranes, echinacea will be one of the best antiseptics. If there be any cerebro-spinal complication, the indications for that remedy will be all the more marked.

Where there is intestinal complications attended by diarrhea, aconite and ipecac, five drops of each to half a glass of water, in teaspoonful doses, will be useful, or ipecac and subnitrate of bismuth in mint-water

may be called for.

The diet should be bland and nourishing. Hot milk is preferable, but if the patient objects, matted milk, either as a drink or prepared as a broth, will be readily appropriated. Meat broths should not be allowed till the convalescent stage has been reached. Tepid baths should be used daily, and the patient kept in a darkened room to protect the eyes.

During the convalescent period the child must be carefully watched; for it is during this stage, when the skin is peculiarly sensitive, that the danger from unpleasant sequelæ arises.

RUBELLA.

Synonyms.—Rothein; Rubella Notha; Epidemic Roseola; German Measles; French Measles; Hybrid Measles; Bastard Measles.

Definition.—An acute contagious disease, characterized by an eruption of a papular form, resembling in some respects both measles and scarlet fever, and in others, possessing characteristics not present in either. A mild fever, accompanied by enlargement of the lymphatics, especially the cervical, submaxillary, auricular, and suboccipital.

Etiology.—It is propagated by a contagion, though the exact nature of the poison is not known. It is specific in character, and one attack generally insures exemption from another, though it does not afford immunity from either measles or scarlet fever. It generally occurs as an epidemic, and affects children rather than adults, though age is no barrier to the disease. The contagion is spread in the clothing by fomites, exhalations from the skin, and also probably by the other excretions.

Symptoms.—This is one of the mildest of the eruptive diseases, if we except varicella. The stage of incubation is from ten days to two weeks.

The stage of invasion varies; in some the appearance of the eruption is the first evidence of the disease, though usually there is some chilliness, headache, pain in head, back, and limbs, coryza, slight sore throat, and tenderness and swelling of the superficial lymphatics of the neck.

The fever is mild, the temperature rising to about 100°, though in rare cases it may reach 103°. The eruption usually appears within twenty-

four hours after the invasion, upon the face and neck, gradually extending over the whole body, and this may be the first evidence of the disease. The eruption consists of a number of small, round, or oval papules, pinkish in color, and may be discrete or confluent. It lasts from two to five days, when it is followed by a slight desquamation, and sometimes by a brownish staining of the skin, which disappears after a few days.

During this period there will be, in many cases, an inflamed condition of the throat, and the tonsils become swollen and painful. The inflammation is superficial, and not attended by sloughing. Sometimes a bronchial cough attends this stage. Though there is glandular enlargement, there is never suppuration. The disease passes through its various stages to a favorable close without serious complications or sequelæ.

Diagnosis.—The diagnosis is made from measles by its less severe onset, the absence of catarrhal symptoms, the more pinkish or rose color of the eruption, and early enlargement of the cervical lymphatics; from scarlet fever, by the slight fever, the absence of the strawberry tongue, no vomiting, and the more pronounced erythema of the latter.

The **Prognosis** is favorable.

Treatment.—This is very simple; aconite and phytolacca being almost a specific, the one correcting the fever, the other influencing the lymphatic system. Where there is nervous irritation, or where there is a burning sensation attending the eruption, rhus tox. may be substituted for the phytolacca, or, what is still better, used in alternation with it. The patient may be sponged with warm water, and when there is much pruritis, use the bacon rind as a means of inunction. The patient should also be anointed while desquamation takes place.

PAROTITIS.

Synonyms.—Mumps; Epidemic Parotitis.

Definition.—An acute, infectious, and contagious disease, characterized by an inflammation of one or both parotid glands, rarely terminating in suppuration, a tendency to metastasis to the testicle in the male, and the ovaries and mammary glands in the female. This is

not to be confused with a metastatic parotitis which sometimes follows or accompanies such infectious fevers as dysentery, diphtheria, and other low-grade fevers.

Etiology.—The specific cause is a contagion generated during the course of the disease, but, like that of the eruptive fevers, its exact nature is not known. Bacteriologists have as yet failed to isolate a specific microbe which will of itself produce the disease. All that is necessary for one to contract the disease, is to come in contact with the breath of the afflicted person, the excretions, especially the salivary secretions, or even the apartments occupied by the patient.

One attack secures immunity from a subsequent one, though single mumps will not prevent the opposite gland from suffering subsequently if exposed to the contagion. While it may be endemic in large cities, it nearly always prevails as an epidemic, affecting children in preference to adults, though the latter are not exempt. It prevails more extensively in the spring and fall months.

Pathology.—Trousseau claims that the lesion does not proceed beyond an exalted hyperemia and congestion, while Virchow believes that there is a catarrhal inflammation of the ducts of the glands. Certain it is that the changes, whatever they may be, are of such a slight character that suppuration rarely occurs. The gland becomes swollen and hard; but after a few days it subsides, resolution being complete.

Symptoms.—Occasionally the patient will complain of feeling ill for a day or two before the development of the disease. The head and back ache, the appetite is impaired, the bowels are constipated, and there is an unpleasant taste in the mouth.

The period of incubation is from ten days to three weeks, during which time there are rarely any symptoms which would indicate the coming trouble. Usually there is a slight chill, followed by more or less febrile reaction, and with the development of the fever the swelling of the parotid gland is first noticed. The child complains of pain just below the ear, especially when it opens or closes the mouth.

In some cases the chill and fever will be so slightly marked that the patient does not call attention to it. In others, every symptom will be marked and severe, and the patient may have a high fever for a week. The swelling may be confined to one side and run its course without the

other gland being at all affected, and then it is said that the person has had single mumps. In this case he will be liable to a second attack, the other gland being affected.

There are not only the usual symptoms—pain, heat, redness, and swelling, all being marked—but we have, in addition, a peculiar nasal voice and considerable difficulty in deglutition. Any pungent substance taken into the mouth will cause pain, and it is generally suggested to the patient to try a pickle. The sourness usually causes some pain in the parotids, and the patient finds that he can hardly swallow or move his jaw. The disease runs its course in from four to eight days; the fever first declines, and then swelling gradually passes away. (Scudder.)

Complications and Sequelæ.—As a rule, mumps is an innocent affair, running its course without any danger, though in rare cases very serious complications may arise. The most frequent is orchitis in the male, and mastitis, ovaritis, or vulvo-vaginitis in the female. As the swelling begins to subside in the parotid, the patient experiences a sharp pain in the newly affected organ, and in a few hours the swelling has increased and an inflammation has set up with all the intensity manifested at the original seat. It may result in suppuration or terminate in resolution. Like orchitis from gonorrhœa, it has no regular course, and may terminate in three or four days, or run for ten or more days.

The most serious complications are the cerebral affections. Where the fever has run a very high course attended by delirium, meningitis has followed. Hemiplegia has also occurred. Otitis media, followed by deafness, has been recorded. The eye is not often affected, though atrophy of the optic nerve has been noted. Arthritis, albuminuria, and endocarditis have each been noticed.

Diagnosis.—The diagnosis is very easily made. The location of the swelling, in front and below the ear, with pain on moving the jaws, especially when any pungent substance is eaten, proves the character of the disease.

Prognosis.—The prognosis is always favorable.

Treatment.—This is simple but effectual. We put our patient upon aconite five drops, phytolacca ten to twenty drops, water four ounces, teaspoonful every hour. If there be a burning sensation experienced,

and the child be restless and cries out in its sleep, the pulse sharp, and the tongue shows elevation of the papilla, rhus tox., five to ten drops, will replace the phytolacca.

Where the fever is intense, and there is danger from cerebral complications, put the patient on gelsemium, ten to thirty drops to four ounces of water, and give teaspoonful every hour, at the same time sponging the head with hot water. Where there is much muscular pain, give macrotys.

Locally the gland may be covered with cotton wadding, over which is placed oil silk, or cloths wrung out of hot water may be applied. Some prefer a lotion of phytolacca and echinacea.

Where the testicle is involved, strap the gland firmly upon the abdomen, and continue the internal treatment used for parotitis. The bowels should be kept open and the patient placed upon a fluid diet, preferably milk. During convalescence, care should be taken that the patient does not expose himself, thereby lessening the chances for metastatic changes.

PERTUSSIS.

Synonyms.—Whooping-cough; Tussis Convulsiva.

Definition.—A specific infectious disease occurring epidemically, and characterized by a peculiar, spasmodic, paroxysmal cough, ending in a whoop. The whoop is caused by the air rushing through the contracted larynx during a prolonged inspiration which follows a paroxysm of coughing, the air in the lung being completely exhausted by the effort. The disease usually attacks children under ten years of age, though no age is exempt. It is also characterized by catarrh of the respiratory tract.

Etiology.—The cause of whooping-cough has always been a matter of conjecture, and various theories have been assigned to account for the lesion. Some have regarded it as a laryngitis, others as a bronchitis.

Friedleben believed that the pressure of the swollen tracheal and bronchial glands upon the filaments of the pneumogastric nerve gave rise to the disease. Baginsky showed by experiment that the superior laryngeal nerve is the nerve that excites cough, and as the posterior laryngeal wall, just below the vocal cords, was supplied by this nerve,

an inflammation of the larynx would give rise to a spasmodic cough. Many others contend that the disease is purely a neurosis, and that the toxin, whatever it may be, spends its force upon the medulla, pneumogastric, phrenic, recurrent laryngeal, or sympathetic nerves.

The general belief at present is, that, like other contagious diseases, it is caused by a specific germ, and many observers have been diligently working to isolate it. Afanassieff and Koplic have found what they believe to be the specific germ. Afanassieff termed it the bacillus tussis convulsivæ. Koplic has more recently isolated a bacillus which very much resembles the one found by Afanassieff, yet differing in some respects, and this he claims to be the genuine article; nevertheless all have failed when brought to the crucial test, and we are still in the dark as to the exact germ.

All we know is, that it is a specific contagion, and that the unprotected, coming in contact with a person suffering with the disease or entering a room where a patient has been staying, will contract the disease.

It occurs as an epidemic, though it is more likely to be endemic in all large cities. Spring and fall are the most favorable seasons for the disease. One attack secures an immunity from the disease. While it prevails largely in children under ten years of age, I have seen it with all its severity in an old man past seventy.

Pathology.—There is no lesion which can be said to be characteristic of whooping-cough in an uncomplicated form. In the early stage there is slight catarrh of the nose and pharynx, which may extend to the larynx, trachea, bronchi, and lungs. In the advanced stage, especially in delicate children, we may find more decided pulmonary changes, such as emphysema, broncho-pneumonia, pulmonary collapse, and great congestion of the lungs; but these anatomic changes are the results of complications, and not characteristic of the disease.

Symptoms.—Authors have divided the disease into three stages following the period of incubation, though they are not always well defined. They are,—(1) The catarrhal stage; (2) The spasmodic stage; (3) The stage of decline.

The period of incubation varies from a few days to two weeks, depending largely upon the susceptibility of the patient, the virulence of the epidemic, and the resisting power of the child, or upon his vitality.

This period comes on so insidiously that the prodromal symptoms are ill defined, and the first evidence of the disease is the catarrhal stage.

The child appears to have taken cold. There is some irritation of the Schneiderian membrane, with increased secretion from the same, and also increased secretion of tears, with more or less hoarseness. The cough, even in the early stage, is suggestive, coming on in paroxysms, though at this time the characteristic whoop is absent. The patient at this period is considered by the mother to have taken cold, and the favorite cough mixture is prescribed; this facing, the physician is consulted, who many times makes the same mistake, only to be discovered when the whoop develops.

The patient now begins the cough with a full inspiration, and continues it till the air is entirely expelled from the lung and the child is completely exhausted. The paroxysm is made up of a series of sharp, hard, exasperating, and explosive coughs, and during its continuance the patient presents to the anxious mother an alarming and frightful appearance.

As the cough progresses, the child becomes red in the face, the color soon changing to a livid or purplish hue; as the violence increases, the eyes seem as though bursting from their position, the lips become swollen, the veins of the neck become distended, and sometimes blood bursts from the nose, mouth, and even the eyes or ears. A glairy, tenacious mucus is expelled as the result of the severe coughing, and frequently vomiting ensues, especially if a paroxysm of coughing comes on soon after taking nourishment.

During this time there is a spasmodic closure of the glottis, and when the paroxysm is over, the child gasps for breath, and the air, rushing through the contracted larynx, gives rise to the whoop. If the paroxysm has been very severe, the child is limp and exhausted for some moments; at other times he resumes the play, interrupted by the fit of coughing, as though the attack was of no importance.

There may be only three or four attacks in twenty-four hours, or they may occur as often as every thirty or sixty minutes.

If the chest be examined during an attack, we will find dullness during expiration, and resonance full and clear during inspiration. The respiratory murmur is, however, indistinct or absent, owing to the small

amount of air passing through the contracted glottis. During the intervals of the paroxysms, various sounds are heard, depending upon the complication. This stage continues from two to four weeks, when the stage of decline follows. There is nothing peculiar to this stage, simply a gradual subsidence of the preceding symptoms.

The paroxysms are increased by exciting the emotions, fits of crying almost invariably bringing on an attack. The inhalation of any irritant will also prove an excitant.

Complications.—The complications are numerous, and give, to an otherwise harmless disease, a degree of danger. A common, though not dangerous, complication is hemorrhage, which may be from the nose or the lung.

Vomiting may be frequent, and at times so severe as to give rise to gastric derangement, resulting in anemia or general marasmus. Ulceration of the frenum linguae is quite common.

The more serious complications, however, are those of the respiratory and circulatory apparatus. As a result of a severe paroxysm of coughing, there may be a rupture of the pulmonary alveoli, giving rise to interstitial emphysema. Broncho-pneumonia, so often attended by collapse, is one of the most serious and fatal results. Enlargement of the bronchial glands often occurs, and, when the patient is delicate or bottle-fed, may lead to tuberculosis. As a result of the great strain upon the heart, valvular troubles are not uncommon. Convulsions are not frequent, though occasionally seen.

Diagnosis.—The diagnosis is readily made after the characteristic whoop develops; before this we may not be positive, although the catarrhal symptoms, hoarseness and spasmodic cough, are suggestive of the trouble.

Prognosis.—Although this affection has been regarded as one of the fatal diseases, Dolan ranking it third in fatality in children's diseases in England, I have never been able to understand the large mortality attributed to it, and an experience of nearly twenty-five years bears me out in saying that the prognosis should nearly always be favorable.

In very young, bottle-fed, delicate babies, with pulmonary complications, the prognosis should be guarded, otherwise it is

favorable.

Treatment.—While I do not claim that we have a specific treatment for this troublesome affection, I do claim that the cough can be so modified and the disease so controlled that the mortality will be very small. Belladonna, given in small doses, is one of our best remedies; add five to ten drops of the specific tincture to half a glass of water, and give a teaspoonful every one, two, or three hours. Our “regular” brother is beginning to recognize its value, for Jacobi regards it as the most satisfactory remedy for this disease. The indications are the same as in other troubles, —dullness, with capillary congestion.

Drosera is called for when the child is hoarse and the cough croupal in character. Bromide of ammonium, where the most marked symptom is the convulsion or spasmodic character of the cough. Dr. Webster speaks very highly of magnesium phosphate 3x. An infusion of red clover blossoms, recently cured, to which may be added simple syrup, is an old domestic remedy of much virtue. Burning a little sulphur in the sleeping-room before putting the child to bed will often insure a good night's rest.

Dr. W. P. Best, of Indianapolis, presented a paper on “Solanum in Whooping-cough” at our National Medical Association, giving his experience with this drug. So favorably was he impressed with the drug, that he sent me a trial bottle. After using it in a number of cases, I am convinced that in solanum we have almost a specific for this troublesome disease.

Bromoform, in from one to five minims suspended in syrup, has recently been highly recommended, though in my hands it has not been as successful as the above described remedies. Inhalations sometimes afford relief.

During convalescence the child should be carefully watched, as it is at this time pulmonary complications are so liable to occur. If the child be delicate and the parents be able to profit by the prescription, a change of climate affords great benefit during the stage of convalescence.

DIPHThERIA.

Synonyms. — Diphtheritis; Angina Maligna; Membranous Croup.

Definition.—An acute infectious disease characterized by a grayish-white, fibrinous exudate, usually located upon the tonsils or neighboring tissues, though it may occur upon any abraded surface; the frequent involvement of the upper air-passages, and a toxemia that is attended by severe prostration; paralysis of certain organs and muscles, together with cardiac weakness.

History.—Diphtheria is one of the most greatly feared, most fatal, and most common diseases of childhood. Its history antedates the Christian Era by more than a hundred years; for Asclepiades performed laryngotomy for respiratory obstruction, and it is therefore probable that he treated croup and diphtheria; while Aretseus, a Greek physician of Cappadocia, whose writings are still extant, accurately describes diphtheria when he says, “The tonsils are covered with a white, livid, or black concrete product,” and adds, if it invades the chest by the trachea, it causes suffocation the same day.

Galen, during the second century, undoubtedly referred to diphtheria when he described a “fatal disease then prevailing, where the patient expelled a membranous tunic by coughing- or spitting.” Aetius, in the fifth century, describes a disease of the throat where the ulceration had a peculiar white, ashy, or rusty color. This undoubtedly was the same dread disease.

From the fifth to the sixteenth century there is no record of the disease; but it is not at all likely that the disease had disappeared from the world, but that the medical writings of the Dark Ages suffered the same as general literature, and the disease most likely appeared during these centuries the same as before and since, numbering its victims by the thousands.

During the sixteenth century epidemics prevailed in various parts of Europe, and the disease has steadily kept pace with the intervening centuries, so that we enter the twentieth century with the dread scourge more thoroughly entrenched in all large cities than it has ever been. This is a sad confession for the medical world to make, when we remember that, during the last twenty-five years, this disease has been studied more, discussed in medical societies more frequently, and has

formed a topic for innumerable journal articles; and yet, notwithstanding these facts, and the great advance made in sanitary methods, there are more deaths recorded to-day from diphtheria than from any other contagious disease. The disease has prevailed in this country ever since its first appearance in Boston, 1638.

Etiology.—The disease usually prevails epidemically, though in all large cities it is endemic. The force of the contagion varies in different epidemics; but, taken as a whole, I am inclined to believe that it is less contagious than scarlet fever. The last thirty years has witnessed greater search for the causal agent than all previous years combined.

Dr. Pruden and others, after careful investigation in a series of cases, came to the conclusion that a streptococcus, which is always present in the membranous exudate, was the causal agent. Dr. W. W. Taylor presented to the London Epidemiological Society the history of a number of cases, to prove that common mold was the causal agent. Others have tried to prove that sewer-gas was a prime factor in producing the disease. Each investigator showed an array of cases to prove his position, yet each and all fail to prove that every case can be traced to the causal agent.

Since 1868, when Oertel discovered micrococci in the pseudo-membrane, bacteriologists have been trying to separate the special bacillus which will invariably produce the disease. While it might be interesting to some to trace the work of such investigators as Oertel, Cohn, Klebs, Loemer, Roux, Yersin, and a host of others, space forbids. Suffice it to say that from out of the great mass of investigations there has been evolved the Klebs-Loeffler bacillus as the causal agent. This is the generally accepted micro-organism which is responsible for diphtheria.

Yet there is ground for much difference of opinion as to the reliability of this germ as the causal agent. First, it is found in other diseases of the mouth and pharynx. Again, it is sometimes found in the healthy mouth and the mucous surfaces of the throat and nose, and finally it is sometimes absent in well-known cases of diphtheria; but in order to prove that this special bacillus is the cause, all cases showing an absence of this germ are denominated false diphtheria, or diphtheroid angina. Hence we divide the bacilli into two classes,—the Klebs-Loeffler bacillus of true diphtheria, and Hoffman's bacillus, or the pseudo diphtheria bacillus, or bacillus xerosis. (See frontispiece.)

We are inclined to believe that the specific cause has not yet been determined. That it is a specific poison is undoubtedly true, and whether it resides in sewer-gas, common mold, or in whatever form or place, all that is necessary is for the poison to come in contact with the individual.

The toxin may so influence the blood that we see the systemic affect first, and the local lesion follows, or, as Dr. Scudder said in 1861: "I hold diphtheria to be a general as well as a local disease, as is proven by the languor, listlessness, torpor of the nervous system, and derangement of the excretory organs, which, as a general rule, precede all local disease; all being symptoms of perversion of the blood, and almost invariably indicating the establishment of febrile reaction. We also find the evidence of the perversion of the blood in the heavily coated tongue, which is always more or less discolored at the commencement of the disease, and always, in severe cases, exhibiting the brownish tinge, with more or less sordes upon the teeth as the disease progresses; in the diphtheritic deposit, which is markedly different from the exudations from highly vitalized blood; in the secretions, the urine in severe cases being abundant, in all cases discolored, frothy, more or less clouded, with a peculiar, somewhat cadaverous odor—what the ancients would have termed *illy concocted*; in the evacuations from the bowels, obtained by cathartics, which are frequently large, dark, and almost invariably fetid; and especially in the condition of the blood itself, when the disease has attained its maximum, which is dark, is not changed by exposure to air, forms a loose and easily broken coagulum, or does not coagulate at all.

"Post-mortem examination in those cases that have run a regular course—i. e., that have not been terminated by an extension of the disease to the larynx—shows us the blood broken down to a considerable extent, more or less discoloration of tissues from extravasation of the coloring matter, and softening of the tissues. These facts, it appears to me, prove conclusively the opinion given above."

Diphtheria in the Lower Animals.—It is now generally admitted that the lower animals may become infected, and they, in turn, communicate the same to others. Especially is this true of fowls and the common domestic animals, cats and rabbits; pigeons and domestic fowls are perhaps more frequently affected than all others.

In Keating's Encyclopedia of the Diseases of Children, Dr. Lewis Smith gives an account of an epidemic of diphtheria communicated from

diseased turkeys, which would seem quite convincing. The author says: "On the Island of Skiathos, off the northeast coast of Greece, no diphtheria had occurred during at least thirty years previous to 1884, according to Dr. Bild, the medical practitioner of the island. In that year a dozen turkeys were introduced from Salonica. Two of them were sick at the time, and died soon afterwards. The others became affected subsequently, and of the whole number seven died, three recovered, and two were sick at the time of the inquiry. The two had a pseudo-membrane upon the larynx, difficult breathing, and swelling of the glands of the neck. As further evidence that the disease was true diphtheria, one of the turkeys, which had survived, had paralysis of the feet. The turkeys were in a garden on the north side of the town, and the prevailing winds on the island are from the north. While this sickness was occurring among the turkeys, an epidemic of diphtheria commenced in the houses in proximity to the garden, and spread through the town. It lasted five months, and of one hundred and twenty-five cases in a population of four thousand, thirty-six died. Diphtheria from this time was established upon the island, and frequent epidemics of it have occurred since."

Predisposing Factors are age, season, climate, and unhygienic conditions.

Age.—Diphtheria is essentially a disease of childhood, though no age is exempt. The ages most susceptible are those between two and eight years, the receptivity diminishing each year thereafter. During the first year of life it is also infrequent, most likely owing to lack of exposure in the very young. One attack does not render the patient immune.

While elderly people are not so liable to the disease, physicians and nurses should be very careful while examining or treating the throat; for in the struggle of the child a portion of the membrane may be forcibly thrown into the face and eyes of the attendant during a fit of coughing.

Season.—It prevails more extensively during the winter and spring months.

Climate.—The disease occurs more frequently in cold and temperate climates than in the tropics. Moisture favors the propagation of all germs; hence damp cellars, where mold collects, favors the spread of the disease.

Unhygienic Conditions.—Poor sanitary conditions lower the vitality and resisting power of the individual; hence render one more susceptible to the poison. Germs of all kinds thrive in filth; therefore decaying organic material, defective drainage and sewage, cesspools, etc., favor not only the propagation of diphtheritic germs, but those likewise of all the infectious fevers. It is true that persons living with the most perfect sanitary conditions are victims of infectious diseases, but this is due to the non-resisting power of the individual to the germ or poison.

Pathology.—Diphtheria being a general as well as local disease, presents pathological features of each.

Local.—The peculiar characteristic pathological feature of diphtheria is the formation of a fibrinous exudate, varying in size and consistency, and locating generally in the throat and near neighborhood. Usually the tonsils and uvula are covered with this exudate, but it may extend in every direction, the entire fauces, the cheeks, the nares, and, passing deeper, the Eustachian tube and middle ear on the one hand, or the nasal duct and conjunctiva on the other, while the respiratory tract may receive the brunt of the attack, and a complete cast of the larynx follow.

In one of my cases, after expelling the membrane from the larynx, the napping of the loosened membrane could be distinctly heard in the bronchi upon auscultation. Others have reported the extension of this exudate through the entire digestive tract, while Smith records the passing of a false membrane from the lower bowel, a foot in length. In the female it may involve the vagina and even the uterus; in the male it has formed on the prepuce. Thus we see that any mucous surface, upon injury or severe irritation, may show the characteristic exudate.

In mild cases this exudate may be thin and superficial, and easily removed, involving only the epithelial layer and superficial mucous surfaces, the neighboring tissues showing a swollen and hyperemic condition; within forty-eight hours the membrane slips off, leaving a slight ulcerative surface. In this case the external appearance is more cleanly looking, being of a whitish gray color.

In the severer cases, the exudate is thicker, more dense, and is firmly adherent in the tissues, like the glass in a watch-case. It is ashy gray in color at first, soon changing to a dirty brownish color as necrosis proceeds. Beneath and around the membrane there is hyperemia, and

the inflamed condition of the tissues results in the discharge of a purulent material. The deeper tissues are infiltrated, and frequently extensive sloughing follows the removal of the exudate.

The pseudo-membrane is composed of fibrin, necrosed epithelium, pus, broken-down leukocytes, blood-disks, and bacilli of various kinds, of which the Klebs-Loemer predominate. The blood-vessels beneath the membrane are congested, and the lymph channels are dilated and filled with fibrous fluid.

The necrosis may be confined to the epithelium, in which case there is but little tissue change: but if the deeper connective tissues are involved, there may be extensive destruction of tissue, including blood-vessels. When the membrane in the larynx and bronchi is thick and tenacious, complete casts may be expelled.

Heart.—Among the most important lesions in severe diphtheria are those that affect the heart. There may be parenchymatous degeneration in the less severe form, while fatty degeneration occurs in the severe case. One or both ventricles may be dilated. The walls of the heart are often flabby, while interstitial myocarditis is not uncommon; a rarer lesion is endocarditis and pericarditis.

Kidneys.—In the severer cases of diphtheria there is nearly always more or less acute nephritis, and a cut surface reveals the process of degeneration. The kidneys are usually enlarged. The urine is generally rich in albumen, casts, epithelium, and leukocytes.

Spleen.—In most diseases where there is toxemia, we find enlargement of the spleen, and this disease is no exception. There is also degeneration of its tissues. The lymphatic glands of the neck are frequently swollen and more rarely hemorrhagic, while suppuration may take place, though not common.

Nervous System.—J. G. Thomas reported in the *Boston Medical Journal*, February, 1898, the lesions produced by diphtheritic toxin, as follows: 1. A parenchymatous degeneration of the peripheral nerves, and at times an interstitial process is added to the degenerative one, accompanied by hyperemia and hemorrhages. 2. Acute parenchymatous and interstitial degeneration in the muscles, especially the heart muscles. 3. Only slight changes in the nerve cells. 4. In rare cases a hyperemia, infiltration or hemorrhage into the brain or cord sufficient to produce permanent

troubles, as hemiplegia and multiple sclerosis.

Blood.—The blood is more or less broken down, the fibrin is deficient, and the tissues are usually stained by extravasation of blood. Leukocytosis is generally pronounced, the increase of leukocytes beginning a few hours after infection.

Symptoms.—The symptoms will depend upon the character of the epidemic, the parts affected, and the complications. We shall not attempt, however, to classify and describe, as separate forms, nasal, pharyngeal, tonsillar, laryngeal, etc., believing that, when these different parts are involved, they are simply extensions of the general disease, and do not need a special classification and description, but will treat them as they occur.

Incubation.—This stage varies from two days to two weeks, depending largely upon the character of the infection and the manner of receiving the same. If by inoculation, from twelve to twenty-four hours may constitute the incubating period, and when the infectious material is very intense, as in the malignant form, the period is also short, from two to four days. The symptoms during this period are not characteristic nor constant, but might be taken for the forming stage of any of the infectious fevers.

Generally the patient is listless and languid, complains of feeling tired, and is not interested in his play; is fretful and restless at night; eats but little, but calls for water frequently, being thirsty; the breath is usually offensive, and the tongue is coated with a moist, dirty fur; the patient may complain of being chilly and of pain in head, back, and limbs. These prodromal symptoms may culminate in a chill, to be followed by fever of varying intensity.

In some the thermometer alone reveals the increase in temperature, while in others the fever is active throughout the course of the disease. The secretions from the skin, kidneys, and bowels are more or less arrested, while albumen is generally found in the urine. As the disease progresses, the fever assumes an asthenic form, and the blood shows the presence of the septic poison by the dirty tongue, fetor, and condition of the mucous surfaces.

The local phase of the disease is shown very early by pain in deglutition, though, in rare cases, the patient experiences no pain,

although inspection reveals an alarming condition. There is usually dryness, the patient swallowing frequently to moisten the throat. On inspection we note that the mucous surface of the fauces, tonsils, and pharynx are reddened and swollen, upon which the characteristic ashen gray exudate appears. Sometimes the throat presents a livid appearance, revealing the malignant character of the attack.

The exudate first appears in small patches about the size of a wheat kernel, but soon coalesces into one or more large patches or mass. The exudate, at first superficial, soon dips into the deeper tissues, and presents a characteristic appearance, embedded like the crystal in a watch; the exudate can not be wiped off like an ulcerated surface, but firmly adheres, and, when forcibly removed, leaves a raw and bleeding surface.

“For two or three days, in the majority of cases, the throat is dry; sometimes, indeed, during the entire progress of the disease. Then secretion is established from the mucous follicles, and, some patches of exudation being removed, there is a free secretion from the denuded surface. The salivary glands also become more active, and the saliva is thick, tenacious, and ropy; and altogether the secretion is large, and requires frequent efforts at removal. Occasionally cases present themselves in which this seems to be the most unpleasant symptom.

“In the latter stages of the disease we may distinguish two classes of cases. In the first the dryness continues, and the parts become stiff and immobile, so that, after a time, deglutition becomes almost impossible, and respiration is rendered very difficult and labored. Extending upward to the posterior nares and nasal cavities, these are closed by the swelling; and descending to the inferior portion of the pharynx and epiglottis, these and associated parts are swollen and rendered incapable of motion, and the patient dies, partly from want of food and drink, and partly from imperfect aeration of the blood.

“In the second class of cases, secretion commences about the second or third day. By the fifth day it is quite free, some portions of the exudation are being detached, and the exposed surface secretes pus. In very severe cases this ulceration progresses in every direction, but is mostly superficial. The tissues seem to have lost their vitality, and the muscles their power of contraction, and they hang feeble and pendulous, and infiltrated with serum where the connective tissue is loose. Thus we have paralysis of the throat in the second as well as the

first case.”

Malignant Diphtheria.—Some seasons the diphtheritic virus possesses a virulence entirely unaccountable. The patient seems stricken with such force that the resisting power of the system is unable to cope with its unequal foe. The patient is dull and listless; the face is a dusky hue; the tongue thick, flabby, and covered with a dirty, pasty coating, or it is dry, brown, and parched; the fever is quite active, the temperature reaching 103° to 104°, or even 105°. The pulse, however, is small, though rapid, showing marked enfeeblement of the heart. In nervous children, vomiting, followed by convulsions, may usher in the disease. The urine is scanty and often loaded with albumen.

The local affection is seen very early; the tissues of the throat are dusky and swollen; the tonsils enlarge, and, with the swollen and edematous condition of the uvula, the throat is so occluded that swallowing is exceedingly difficult, painful, and often impossible, the fluid returning through the nose. To add to the gravity, a cellulitis develops, and the deeper tissues of the neck are involved. The lymphatics of the neck become hard and swollen, the nares become almost closed, causing difficult respiration. The exudate soon appears on fauces, tonsils, and uvula, frequently passing to the nares.

If the child lives long enough, the necrotic exudate gives way, leaving a ragged and foul-looking ulcer. The odor is peculiarly offensive. From the nares a bloody, sanious, excoriating discharge takes place. The extremities become cold, the child becomes drowsy, the face becomes more dusky, the heart beats feebly, and finally death relieves the sufferings of the little patient. If convalescence takes place, recovery is slow, the heart showing the effects of the poison in the feeble frequent pulse.

Nasal Diphtheria.—While in a severe case of pharyngeal diphtheria the membrane may extend to the nares, we are not to overlook the cases where the exudate is primarily in the nares. In these cases we have all the general symptoms of diphtheria, but the throat remains clear for the first few days, though the exudate may ultimately extend to the pharynx and neighboring structures.

The exudate is usually not so firm, though sufficient to obstruct the nasal passage, and causes the child to breathe with the mouth open. An offensive sanious discharge excoriates the end of the nose and lips, and

the child fights all efforts to relieve it.

When the child sleeps, the mouth remains open, and a bubbling, distressing respiration is heard. The exudate may extend to the conjunctiva, causing the eyelids to become swollen and discharge pus, or the inflammation may extend along the Eustachian tube, affecting seriously the middle ear.

Laryngeal Diphtheria.—This form is the most alarming, and causes more suffering than all other forms. The presence of the membrane is first made known by the hoarse, croupal cough, soon to be followed by the ringing, metallic cough and whistling respiration, which, once heard, can never be forgotten. The fever is not usually high, in fact may be normal, and in fatal cases may be subnormal. Inspiration and expiration are difficult, the epigastrium and lower intercostal muscles being forcibly retracted with each inspiration.

The child now labors for breath, is restless and tosses about; the respiration is sibilous or whistling, the cry shrill and piping; the face now shows the effects of the impaired respiration and imperfect aeration of the blood, in the bluish color of lips and nose. The voice sinks to a whisper, the child becomes more quiet, dull, and drowsy, the pulse small and feeble, the extremities cold, and death ends the struggle.

Where recovery takes place, the membrane becomes softened, and small bits of it are expelled with each paroxysm of coughing, till finally the larynx becomes free, and the voice and respiration are restored to the normal condition. In the severer forms the membrane extends to the trachea and bronchi, which still further obstructs the respiration and adds to the gravity of the disease.

Sequelæ.—The most serious and also the most important sequela is paralysis. This is a neuritis due to the toxic poison. It most frequently affects the throat, and comes on two or three weeks after convalescence. When the patient attempts to swallow, especially liquids, they are returned through the nose. There is also a peculiar nasal twang to the voice which is characteristic. The lower limbs are also frequently the seat of the trouble, and the knees suddenly give way while walking.

The most serious sequela of all is paralysis of the heart, which is the cause of the sudden death that occurs after the patient has recovered from the severer forms of the disease. The prognosis is generally

favorable in the forms of paralysis save that of the heart.

Chronic naso-pharyngeal catarrh is also quite a common result of diphtheria.

Diagnosis.—The diagnosis of diphtheria is usually not very difficult, and since the Klebs-Loeffler bacillus is found in some healthy throats, and may be absent in severe angina diphtheria, we will have to depend on clinical evidence for our diagnosis.

The history of the case, the prostration, the small, feeble pulse, the dirty tongue, the peculiar odor, and albumen in urine, and especially the characteristic ashen gray membrane, covering the tonsils and in most cases the uvula; the membrane not easily removed being embedded in the tissues,—are symptoms that can not readily be overlooked. Even in mild cases the exudate is distinct and the diagnosis readily made.

If the physician be called in late in the disease, and the exudate has disappeared, the diagnosis is not so easily made; yet the prostration, feeble pulse, and presence of albumen, even though we failed to get a history of the presence of the membrane, would be very suggestive of diphtheria.

Just here we desire to say a word as to the identity of diphtheria and membranous croup. We take the ground that they are distinct and separate diseases, though we have laryngeal diphtheria. Membranous croup comes on more or less suddenly, does not prostrate the patient as does diphtheria, there is but little evidence of sepsis, no fetor, and the patient succumbs, not to systemic poisoning, but from asphyxia.

Prognosis.—The prognosis depends upon several conditions, such as the character of the epidemic, the complications, and the age of the patient. Some years the disease appears in a mild form, and nearly all cases yield to treatment, while at other times such a malignancy attends the disease that but few recover. In 1883 I received a letter from a physician in Dakota, asking for help in the treatment of diphtheria. He wrote, “Nearly every one that contracts the disease dies, no matter what school treats them.”

When the local disease extends from tonsils to uvula, to the nares and to the larynx, these are always serious, and the prognosis should be guarded. Age also figures in the prognosis; for the younger the patient,

the more likely to a fatal termination. If there is broncho-pneumonia, the danger is increased. Then the tendency to paralysis after the grave symptoms disappear makes this one of the most treacherous of all diseases, and therefore, unless of a mild type, we should be guarded in our prognosis.

Treatment.—As soon as the diagnosis is made, the patient should at once be isolated, the preparation of the room being the same as for any infectious disease; viz., the removal of all unnecessary furnishings, such as carpet, draperies, etc. Where possible, the room selected should be large, with exposure to the sun, and well ventilated. All discharges from nose and mouth should be received on cloths and burned.

Where possible, a nurse should be employed and kept away from the other members of the family. The physician should be especially careful, when inspecting the throat, not to receive any of the discharges from the mouth of the patient during a paroxysm of coughing, which often occurs when the tongue is depressed and the doctor is making his examination. As soon as the patient is convalescent, the room should be thoroughly disinfected.

The medical treatment will consist of both local and systemic measures. Internally, if the temperature is high, with small, quick pulse, give aconite five drops to water four ounces. I am aware that there is an idea prevalent among a great many that aconite should not be given in diphtheria, it being a depressant, but an experience of twenty-five years in the use of this remedy does not justify the impression. If the small dose be used, I am satisfied that it is beneficial. To this we add phytolacca, fifteen to twenty drops, when the glands of the neck are swollen or when there is congestion of the tonsils.

If there be a foul odor, alternate baptisia with the former remedies. If the tissues are full and bluish, give echinacea one drachm to water four ounces. This is one of our best remedies, a good antiseptic and sedative combined. Where the breath is bad, that peculiar stench so often found, I find nothing equal to potassium chlorate and phosphate of hydrastine. This is another agent which is given credit for giving rise to nephritis, but years of experience in its use does not bear this out; perhaps the hydrastine overcomes this tendency. I am sure that the following is one of our best combinations: potassium chlorate, one drachm; hydrastine, five grains; water, four ounces; a teaspoonful every one or two hours. If the patient is old enough, have him gargle with a solution of the same

strength. If the tongue and mouth become dry and brown, give hydrochloric acid ten to twenty drops, simple syrup, and water, of each two ounces; a teaspoonful every one, two, or three hours.

To keep the throat as clear as possible use a gargle of potassium chlorate and hydrastine or salicylic acid and borax; of the latter each ten grains, to water four ounces, or a spray of three per cent solution of pyrozone. In malignant cases, threatened with heart-failure, Dr. Webster speaks highly of lachesis. Where the nose is obstructed by the exudate, and a sanious discharge is excoriating the lip, the nasal toilet is especially beneficial. Unfortunately these cases are found mostly in children, and it is impossible to spray or cleanse the nose.

Where the larynx is involved, the use of inhalations will give the best results. With the first croupal symptom place a quart of boiling water in a vessel, and add a cup of cider-vinegar and a handful of hops; place this over a burner near the bed, and, by means of a tube, convey the steam directly to the child's face, so that the inhalation may be constant. This will soften and loosen the membrane. Now give nitrate of sanguinary 2x or 3x every hour, and the membrane will be expectorated in small particles or in long shreds. Inhalations of steam from boiling water is highly recommended. A cold pack to the throat may give some relief when the patient is suffering pain.

Serum Therapy.—The last few years have found many advocating the use of antitoxin. Statistics, both pro and con, have been offered to prove both its usefulness and also its danger. That harm has followed its use, none will deny; yet many able men claim good results for the serum treatment. Personally, I have not been successful in its use, and believe that the treatment above outlined will give by far the best results.

The diet should be fluid in character, milk being preferable. The child should be carefully watched during the convalescence for signs of heart-failure, and with the first evidence, put the child to bed and give cactus, digitalis, or kindred remedies.

INFLUENZA.

Synonyms.—Epidemic Catarrhal Fever; La Grippe.

Definition.—An acute infectious disease, the contagiousness of which

is questionable, protean in character, but affecting more constantly the respiratory apparatus and nervous system, attended by great prostration and occurring epidemically and pandemically. Following a general epidemic it occurs sporadically for one, two, or three years.

History.—While it is very likely that the disease has existed for ages, and that the epidemic which raged among the Greek soldiers at the siege of, Syracuse, 395 B. C., was influenza, and that the epidemics of 827, 888, 896, 927, and 996 were of the same character, the authentic historical accounts date, according to Hirsh, to an epidemic which prevailed in Italy, Germany, and England during the month of December, 1173. Even this and the epidemics of 1293, 1323, and 1387 are considered unreliable by most medical writers, who date the first reliable account to the epidemic or rather pandemic of 1510, which visited Spain, Italy, Hungary, Germany, France, and England.

Since this historic date, the disease, at intervals of a few years has swept over countries with a rapidity unknown to any other affection.

Since 1655, repeated epidemics have occurred in our own country, the last (1889-90) being the greatest pandemic that ever swept the earth. Beginning in Bokhara, in Southern Russia, it crossed the great Russian Empire, spread over Germany, invaded England and France, and in less than six months had made the circuit of the globe.

Its force is irresistible, and it spares neither age, sex, nor condition. The millionaire and the pauper stand helpless before this Nemesis. Fortunately, unless severe complications arise or the treatment be too heroic, the mortality is small.

Etiology.—To what extent meteorological conditions figure as a causal agent, we are unable to state, and while damp, cold, foggy weather may present conditions that are favorable to the generation and the propagation of the poison, it is not likely that it produces the primary toxin.

In 1892, Pfeiffer, at the Hygienic Institute of Berlin, discovered in the sputum of influenza patients a bacillus which was characteristic, and which he separated and cultivated, a culture of which injected into rabbits gave rise to influenza. Kitasato and others confirm the discovery, and claim that this specific germ is not found in any other disease, and those who believe in the microbic theory consider the

bacillus of Pfeiffer the causal agent.

The method of entrance into the system is most likely by way of the respiratory apparatus, and the rapidity with which it travels and the great number attacked, irrespective of contact with each other, warrants this position.

The scourge usually lasts from four to seven weeks. One attack does not render a person immune, and a second or third attack is common. The exhaustion that attends the disease renders the system susceptible to the influence of any and every toxin, and the sequelae of grip are legion.

Pathology.—There are no characteristic anatomical lesions in a case of uncomplicated influenza. Where the disease has continued for some time, the mucous membrane of the air-passages as the disease progresses this becomes more profuse, is removed with less effort, the cough is easier, and the paroxysms occur at longer intervals. With the increased secretion of the mucus, the fever subsides, all the symptoms are mitigated, and the patient enters the convalescent stage from the fifth to the eighth day.

In more severe cases a severe catarrhal bronchitis develops, with the usual attendant symptoms.

One of the most frequent and severe complications of this type is pneumonia. The cough is short and hacking, the respiration labored and oppressed, and the patient presents an anxious appearance. If the pleura be also involved, a sharp lancinating pain accompanies the cough. The sputum assumes the characteristic rusty form, the crepitant and subcrepitant rales develop, there is dullness on percussion, and the dusky hue of the face speaks of imperfect aeration of the blood, and the patient has to be propped up in bed to assist the inspiratory muscles in filling the lungs. The symptoms are so pronounced that the case can not be mistaken.

Heart-failure may occur in this type, though very rare, unless depressants, like the coal-tar products, have been used.

Gastro-Intestinal.—In some the stomach and bowels appear to receive the force of the infection, there being nausea and vomiting, together with diarrhea. This type was noticed quite frequently in 1891. The

diarrhea was dysenteric in character, there being a great deal of tenesmus and pain. With this type the catarrhal symptoms were slight, and might be overlooked. Children were more affected with this form than adults.

Nervous.—This type is especially severe in persons of nervous and excitable temperaments. The headache is intense, the patient is restless and irritable, the eyes are bright, the pupils contracted, and delirium is often present. The fever is acute, the temperature being 104° or 105°. In the severer forms a meningitis develops, with the usual attendant symptoms. In all these forms the fever is remittent in character.

Sequelæ.—There are few, if any, diseases that leave so large a train of chronic lesions in their path, the most prominent being chronic bronchitis. Asthma, laryngitis, and phthisis have more rarely followed. An enfeebled action of the heart persists for a long time, and angina pectoris occasionally follows.

Chronic catarrhal diarrhea is one of the results, while nephritis and cystitis occur sufficiently often to render the victim most miserable.

The most painful sequelæ, however, are of the nervous system,—migraine of a severe and intractable character; neuralgia of various parts ; insomnia, that renders the patient's life a burden, and makes him grow thin and cross and irritable; melancholy, that dread affection that robs life of its pleasures, yet makes its owner dread to lay it down; and, lastly, mania, which is worse than death,—these are a few of the results which follow influenza.

Diagnosis.—The diagnosis is easily made. The sudden invasion, the catarrhal symptoms, the hard, dry cough, intense pain in head and back, and general aching of the body, the marked prostration, are characteristic, and can hardly be mistaken.

Prognosis.—The prognosis is usually favorable, though severe complications, like pneumonia, pericarditis, or nephritis, would make the prognosis problematical, as it would in delicate children and among the very aged.

Treatment.—Our school has been successful to a remarkable degree owing to the fact that the treatment has not been routine, but each phase of the disease has been met with remedies directed to control

certain conditions, rather than in treating it as a whole. Specific remedies for specific conditions have certainly been successful.

If we keep in mind the important fact that grip is depressing and rapidly exhausts vitality, it will save us from serious mistakes. First, we insist most emphatically that the patient take his bed early, and remain there until the fever has disappeared. Secondly, we avoid depressants as we would a pestilence. A depressing treatment added to depressing disease has been responsible for many deaths that have been attributed to some grave complications. With the exception of a single dose of phenacetin or antikamnia in the beginning, we discard the use of all coal-tar products.

In most cases the patient aches all over, or, as he expresses it. every bone in his body aches, and the myalgia is so great that the patient is crying for relief. In these cases, where the heart action is good, one five-grain antikamnia powder or a three-grain phenacetin powder, followed by the appropriate remedy, will relieve the headache and the backache, and render the patient fairly comfortable within an hour. This is the extent of my use of the coal-tar products. One powder at the beginning of the disease, followed by the judicious use of the specific, will prevent a return of the severe pain. If the heart action is weak, however, it must not be used, though severe pain is nearly always accompanied by a full, bounding pulse.

Aconite.—If the pulse be small, give aconite five drops to water four ounces. - Teaspoonful every hour.

Veratrum.—In the adult the pulse is usually full, strong, and bounding, with flushed face, bright eyes, and contracted pupils. Such cases need veratrum fifteen to thirty drops, and gelsemium ten to twenty drops, to water four ounces. Teaspoonful every hour, until the pulse responds to the sedative and the irritation of the nervous system subsides, when we give it every two or three hours. If the patient is restless or unable to sleep, a five-grain diaphoretic powder may be given.

Bryonia.—For the cough, which early develops, and is attended by chest-pains, bryonia five to ten drops, with the appropriate sedative, will give the best results.

Macrotys.—If there is muscular soreness, rheumatic in character, or if it be about the menstrual period, macrotys will be the better remedy.

Ipecac.— Where there is intestinal irritation, give ipecac ten drops to four ounces water, a teaspoonful every hour.

Bismuth Subgallate.—Where there is but little fever, with persistent diarrhea, subgallate of bismuth five to ten grains, and one-eighth of a grain of opium, every four, five, or six hours, will be found efficient. Should complications arise, they will be treated according to the special condition present.

The heart should be carefully watched, and cactus, crataegus, digitalis, or strophanthus employed as they may be needed. These agents, however, will seldom be needed if the coal-tar products be withheld.

The diet should be light, milk in some form being preferable. The patient should not be allowed to return to his work too soon.

PNEUMONIA.—SEE RESPIRATORY DISEASES.

ERYSIPELAS.

Synonym.—St. Anthony's Fire.

Definition.—An infectious disease, characterized by an acute and specific inflammation of the skin and subcutaneous tissues, attended by a shining redness, which spreads rapidly; marked swelling and pain, and which finally terminates in desquamation. A fever of variable intensity, moderate prostration, and supposed to be caused by the streptococcus erysipelatis.

Etiology.—The cause is undoubtedly a specific toxin or germ which gains entrance into the lymph channels through an injury to the skin. Modern pathologists ascribe the cause to the streptococcus erysipelatis of Fehleisen, though this is perhaps identical with the pus-producing streptococcus. If this be true, the old division of idiopathic and traumatic erysipelas will have to be discarded; for there is undoubtedly some injury to the surface, although it may not be perceptible, whereby the infection finds entrance. This may be surgical or accidental, such as an intertrigo or an acute pustule, or the abrasion may be within an orifice and not visible, as in the nose or mouth, or the traumatism may be of the uterus during the puerperium.

Predisposing causes are, poor hygienic surroundings, which in former times were the cause of so much erysipelas in hospitals, and following confinements. Age also predisposes to this lesion, those being the most susceptible who are between the ages of twenty and thirty. Previous attacks also render one more susceptible, thus being different from all other contagious diseases.

Pathology.—Erysipelas is a true dermatitis, involving the skin, subcutaneous, and mucous surfaces. The blood-vessels are dilated and distended with blood, and cell-infiltration may extend into the deeper tissues, where suppuration is apt to take place. The cocci are found in the lymph spaces of the affected area, while beyond this they are found in the lymph vessels, where the battle is fought and won by the leukocytes (phagocytes).

Aside from the local affection, the toxin in severe cases causes granular degeneration of the heart, kidneys, spleen, and liver. According to Osier, some of the worst cases of malignant endocarditis are secondary to erysipelas.

Symptoms.—The period of incubation is variable, it being from three to ten days after the entrance of the infection before the development of the disease. The prodromal symptoms are common to inflammations generally; viz., headache, loss of appetite, furred tongue, partial arrest of the secretions. These terminate in the chill in the adult, or more likely in a convulsion, if the patient be a child. Following the chill, reaction occurs, with rapid rise in temperature, the thermometer registering-103° the first day, 104° the second, and 105° to 106° by the third or fourth day, usually the days of greatest intensity. The pulse is full and bounding, the tongue is coated with a dirty fur, or it is brown and dry. The skin is dry and more or less constricted, the urine is scanty and high colored, and the bowels are constipated.

The local affection begins with a bright-red spot, slightly raised, more or less edematous, and with a tendency to spread rapidly. The part is hot, swollen, and painful, and often slight blisters form upon the affected part. If that part be the face, the favorite seat of the disease, the swelling extends to the eyes, which it soon closes; then involves the ears, which become enormously enlarged; and finally, when at its height, the features of the patient are so obliterated as to render him unrecognizable by his nearest friends.

The pain, during this period, is of a burning, itching, or tingling character. Where the fever is high, the patient is restless, and delirium is not uncommon. There is some slight remission in the fever in the morning, though the fever is active from four to seven days when the inflammation reaches its height, the fever rapidly subsides, and by the tenth day the patient is convalescent.

With the decline in temperature the redness fades, the swelling subsides, and desquamation of the skin follows. . If the scalp has been involved, a long-continued alopecia results.

Diagnosis.—The diagnosis of erysipelas is generally quite easy. Beginning with a chill, there is the early appearance of the local inflammation, in the form of a bright-red spot, and marked tumefaction, the redness rapidly and uniformly spreading. The surface being hot and painful, can hardly be taken for any other affection. Urticaria, erythema, acute eczema, or rhus poisoning, are not attended by the severe constitutional disturbance, and so are readily excluded in making the diagnosis.

Prognosis.—The prognosis is favorable; for while the fever is very active and the constitutional disturbance marked, the mortality is very low. In old and impoverished subjects, the prognosis must be guarded, and also in infants and in puerperal women.

Treatment.—The treatment will be both constitutional and local, and if we forget, for the time being, the name of the disease, and treat the patient specifically, there is no question as to the outcome.

For the full, strong pulse and high temperature, give vera-trum twenty drops, to water four ounces; a teaspoonful every one or two hours. To aid the sedative the patient should be sponged with warm water. If the tongue be pasty and dirty, sodium sulphite, a saturated solution every three hours, will be our-best remedy.

Where the tongue is red and dry, muriatic acid will give relief, or if the doctor must give iron, this is his case: muriate tincture of iron one-half drachm, aqua dest. and simple syrup of each two ounces; a teaspoonful every two hours. Where the tissues are blue and full, tongue broad and moist, echinacea one to two drachms, aqua dest. four ounces, will be indicated. Of this give a teaspoonful every hour. Where the patient

complains of burning and smarting, and there are one or more vesicles formed, and where the pulse is sharp and hard, rhus tox. is our best remedy; thus, aconite five drops, rhus tox. ten drops, water four ounces; a teaspoonful every hour. If the patient is dull and drowsy, the pupils dilated, belladonna ten drops, to water four ounces, is the remedy to use; but if the patient is restless with flushed face, or if there is active delirium, gelsemium replaces the belladonna. These remedies, given according to the above conditions, will tide the patient safely through the most severe attacks of the disease.

The local treatment will also depend upon certain conditions. Where the pulse calls for veratrum, the local lesion is red, hot, and painful, here the part should be painted with full-strength veratrum every three hours, and we may add to this agent a little glycerin to keep the surface moist. Where the part is dusky, belladonna and glycerin may be applied every two or three hours. Dr. Webster speaks highly of echinacea as a local remedy, and I am satisfied that its use would be beneficial. Where the part is intensely hot and painful, cold water will be found not only grateful to the patient, but also of benefit.

The diet should be fluid in character and highly nutritious. Milk, sherry whey, malted milk, egg's beaten in milk, and fruit juices will be appropriate. The patient should be nursed as in any other contagious disease, care being taken as to cleanliness of bed and linen and good ventilation.

SEPTICEMIA.

Definition.—That morbid process commonly known as blood poisoning, in which, with or without a local site of infection, there is an invasion of the blood by bacteria or their toxins.

Etiology.—Whether the disease is caused by streptococci, staphylococci, or a combination of micro-organisms, or to septic intoxication due to the ptomains developed from these organisms, or all these forces combined, has not been definitely determined. On one point, however, all are agreed, and that is, that there must be an absorption of septic material.

Thus it may result from the retention of a partially decomposed placenta or fetus, or a pus tube; old tubercular cavities in which is broken-down tubercle; from septic fluid in the pleural cavity, or from typhoid ulcers. It

may be possible that chemical poisons or toxins when absorbed give rise to this condition. The trimming of a corn, the injury from a fish-fin, may be the open door whereby the poison may enter.

Pathology.—The blood is found to be dark, diffuent, and rich in bacteria. The liver and spleen are soft, dark in color, and show cloudy swelling. The lymphatics are swollen as a result of the inflammation that invariably exists.

Symptoms.—The symptoms of septicemia vary very greatly, according to the degree or kind of infection. Thus in sapremia, the infection is due to septic intoxication from putrefaction changes, and is caused, not by the presence of micro-organisms in the blood, but by ptomains, where the symptoms are less severe than in true septicemia. and where both cocci and toxins are present in the blood. The period of incubation is from one to three or four da vs.

If caused by ptomains due to changes in milk, cheese, or canned goods, the forming period is very short, only a few hours. A slight chill, accompanied by great gastro-intestinal irritation, ushers in the disease. Febrile reaction follows the chill, the temperature reaching- 103°, 104°, or 105°. The pulse, at first full and frequent, soon becomes small and rapid, with more or less prostration. In the more severe cases, delirium may early manifest itself, though the more frequent condition is that of dullness and apathy, changing to coma.

If there be local infection, as from the puerperal state, the symptoms may develop more gradually. Preceded by prodromal symptoms a marked chill announces the fever, which gradually rises until the temperature reaches 104° or 105°. The tongue, at first broad and coated with a dirty fur, changes to a dry brown coating. The breath is offensive, and the lochia fetid. The skin is dry and more or less constricted; urine high-colored and offensive.

The fever is irregular, sometimes showing marked remission; again of a typhoid type. A low muttering delirium, followed by coma and great prostration, frequently is the warning of the inevitable termination—death. Again the septicemia may be a combined infection as in diphtheria, pneumonia, tuberculosis, endocarditis, etc. Here the symptoms of the local disease precede, and often mask for a long time, the true condition. Thus in a case of diphtheria, the patient may have seemingly passed across the danger-line of a malignant form of the

disease. The membrane disappears, the throat clears up, and yet our patient does not convalesce. There is a low, irregular fever, the pulse is small and feeble, the heart is poisoned by the toxins engendered, and the patient dies of heart-failure caused by septicemia; or, if recovery take place, weeks elapse before the patient's health is restored.

What is true of this disease is sometimes observed in pneumonia, erysipelas, and others of a kindred type. Where the infection is due to toxins, the symptoms are of a very grave nature, typhoid in character, the tongue early showing evidence of sepsis. The secretion tells the same story, while the nervous system confirms the evidence of both. Death is usually the termination of this form, in from three to seven days.

Diagnosis.—The history of the patient will assist materially in making our diagnosis. A retained placenta, a puerperal peritonitis, a tubercular ulcer, and kindred lesions, would shed much light on the case, while toxins from milk, ice-cream, cheese, canned goods, etc., would be equally plain, and local injuries could not well be overlooked.

Its more rapid development and less marked initial chill would enable one to differentiate it from pyemia. In the latter disease the fever is more irregular, chills and rigors recurring as in malarial fever. A jaundiced appearance of the skin is more pronounced in pyemia, and, while not constant, should have weight in recognizing the disease.

Prognosis.—The prognosis will depend upon the character of the poison, the amount of infection, the ability of the system to remove the offending cause, and the skill with which we meet the septic processes by antagonistic remedies.

If the offending cause can be removed before the system is thoroughly infected, the case will terminate favorably. Where there is great gastrointestinal irritation, the circulation rapid but weak, and when delirium appears early or coma becomes marked, the prognosis will be unfavorable.

Treatment.—It seems hardly necessary to say that we must get rid of all sources of putrefaction that are still further poisoning the patient. If a pus tube be the offending organ, it should be removed or drainage established. If the uterus contain offending material, it should be emptied of all debris. Where there is a diseased endometrium, it should be thoroughly curetted, and, when necessary, this should be followed by

flushings with mild antiseptic solutions. Usually, however, the curetting alone is sufficient.

When due to suppurative peritonitis, the abdomen should be opened and free drainage allowed. In some cases a thorough flushing of the abdominal cavity with a weak saline solution will give satisfactory results. Any and all cavities that contain pus should be emptied when it is possible.

The internal medication will depend upon the phase of sepsis as shown by well-defined symptoms. Thus, a patient with a broad, pallid, dirty, heavily leaded tongue, would need a saturated solution of sulphite of sodium, while a patient with bad breath, foul secretions, and yellow, dirty tongue would need a saturated solution of potassium chlorate and hydrastis.

Where the tongue was dry, lips and teeth covered with sordes, the mucous surfaces red,

Hydrochloric Acid	10 to 20 drops C. P.
Simple Syrup, and	
Aqua Dest	2 ounces each M.

will give good results.

Where the tongue is full and discolored, the tissues are full and purplish or dusky in color, echinacea or baptisia should be given. The organs of excretion should be kept free, that as much of the effete material as possible may be eliminated through these channels.

PYEMIA.

Definition.—An infectious disease due to the absorption of animal poisons, principally pyogenic organisms, and characterized clinically by the formation, in the various tissues and organs, of multiple metastatic abscesses.

Etiology.—One of the forms or a combination of pyogenic micrococci are held to be responsible, by experimental investigators, for this condition. The streptococcus and the staphylococcus are the forms most constant, though it is not uncommon to find the micrococcus lanciolatus,

the gonococcus, the bacillus coli communis, bacillus typhosis, bacillus pyocyaneus, and many other specific micro-organisms.

These pyogenic organisms, either by their specific action or by the toxins they produce, cause coagulation-necrosis of the neighboring tissue cells, and as this process extends, inflammation of the veins and other vessels takes place; as a result of this inflammatory action, the endothelium becomes detached, and, with its contained micrococci, is floated off by the blood-stream. In its course they reach some part of the circulatory system, where, owing to its diminished size, they can not pass through; as a result, the embolus thus obstructs the vessel, stasis occurs, and, when the soil is suitable, these micro-organisms set up new suppurating centers.

Pathology.—The cadaver, strange to say, does not undergo putrefaction as rapidly as in septicemia. The first effects of the morbid changes are found in the veins, which result in thrombi. These float off and are found in the lungs, liver, spleen, kidneys, brain, and, in fact, the various organs and tissues of the body. These thrombi, rich in micro-organisms, suppurate, and thus the so-called metastatic abscesses are formed.

The location of these abscesses depends, to some extent, upon the site of the primary focus. Thus, if it be in the region drained by the portal circulation, the liver would be the seat of these necrotic spots. If an ulcerative endocarditis be the seat of the primary lesion, the secondary abscesses will be found in the lung, spleen, kidneys, brain, intestines, and skin. These abscesses are usually small, though a coalescence of several of them may form quite a large cavity.

A favorable seat for the primary foci, when not traumatic, is the subcutaneous cellular tissue; the pelvic cellular tissues and organs; the marrow of the long bones; the neighboring tissues of the middle ear cavity; the joints, and, as already stated, an ulcerative endocarditis.

Symptoms.—The symptoms of pyemia vary greatly in different cases, depending, to a great extent, upon the local lesions, though the general symptoms will be similar in all cases.

Incubation.—Since the disease is secondary to suppuration in some part of the body, morbid changes have been going on for several days before the pyemic state is reached. From five to ten days after the reception of

the wound may be considered the forming stage. The symptoms during this time are not characteristic, but may be the same as those of other lesions; viz., general malaise, headache, loss of appetite, a furred tongue, slight constipation, and a sensation of continued weariness.

The disease is ushered in with chilly sensations or a pronounced rigor. These may recur at irregular intervals, or be so regular in their cycle as to be mistaken for malaria. Following the 'chill, there is a rapid rise in the temperature, reaching 103° or 104° in a few hours, to be soon followed by a drop of several degrees, and attended by profuse sweating and great prostration. The fever is of an intermittent or remittent type, and interspersed by frequent chills.

There is usually but slight gastric disturbance, though the appetite is gone, the tongue is furred, and a peculiar sweet, nauseating odor tells of the involvement of the internal organs.

Where the lungs are the seat of the abscess, there is more or less dyspnea, cough, and sometimes a purulent expectoration follows. If the abscess be located superficially, there may be pain and symptoms of pleurisy present, while a rusty sputum tells of pneumonic complications.

When the liver is the seat of the local trouble, the conjunctiva and skin assume a decided jaundiced appearance. There is tenderness over the liver, and percussion reveals quite an enlargement. Diarrhea is a frequent accompaniment.

Pain, marked tenderness, and enlargement in the left hypo-chondrium would suggest splenic infarction.

Involvement of the kidneys will be recognized by albumen and casts in the urine, and sometimes pus and blood.

The rapid but feeble pulse, the sense of oppression in the cardiac region, would suggest endocarditis.

Delirium, followed by coma, would suggest the brain as the seat of the embolic abscess, while hemiplegia, strabismus, ptosis, deafness, etc., would determine the meningeal character without doubt.

The location of pain, the swelling and tenderness, would determine arthritic complications.

The course of the disease is marked by rapid loss of flesh, great prostration, excessive sweating, and frequent bed-sores; the patient usually dying from exhaustion or the involvement of some vital part by the suppurative process.

In chronic cases the patient may linger for months, the fever assuming a remittent type, chills occasionally intervening. The emaciation is progressive, the skin is dry, yellow, and shriveled, and ugly bed-sores may render life almost unbearable. After weeks or months of suffering, the patient succumbs to the superior septic process that waged a successful warfare.

Diagnosis.—The diagnosis is usually comparatively easy, though in some instances it may be overlooked or mistaken for typhoid fever. The irregular intermittent fever may at first be mistaken for malaria, but the administration of quinia will determine its true character, quinia having no influence in arresting the periodicity of pyemia.

The diarrhea and enlarged spleen might be mistaken for typhoid fever, but the absence of rigors, the profuse sweats of the former, and the typical eruption of the latter, will enable one to differentiate between the two.

Prognosis.—Pyemia is a very grave disease, and is usually fatal, some cases lasting only a few days. Where the surgeon can come to our aid, evacuating pus cavities and securing good drainage, and where the vitality is strong, an occasional recovery takes place.

Treatment.—Wherever possible, abscesses should be thoroughly emptied, flushed with antiseptics, or packed with antiseptic gauze, frequent dressings being necessary to keep the cavities sweet and clean. Unfortunately the region of suppuration is, many times, inaccessible, and we must resort to medicine to combat the suppurative process. Echinacea in full doses will be used with the usual symptoms calling for this agent,—the mineral acids, where the tongue is dry and red; the sulphites, where the tongue is coated with a nasty, dirty, moist coating; and the chlorates, with the unpleasant odors.

Calcium sulphide is generally indicated wherever there is pus, and may be administered on trial.

For the profuse sweating, aromatic sulphuric acid or atropin will be given.

A nutritious diet to support the patient's strength is an important feature.

TUBERCULOSIS.

Definition.—An infectious disease, generally recognized as caused by a micro-organism, the bacillus tuberculosis of Koch, and characterized by the formation of small nodular bodies, tubercles, varying from the size of a millet-seed to that of a mustard-seed, or even larger. They may infiltrate the general tissues, miliary tuberculosis, or, aggregating, form tubercular masses. These bodies undergo caseation, followed by ulceration or, more rarely, calcification.

History.—Could one write the history of tuberculosis in full, he would chronicle more suffering, more distress, and more deaths from this lesion than from any other disease that flesh is heir to. For twenty-five centuries this foe of the human race has steadily marched the highways of life, his victims increasing in numbers with the advance of years, and the twentieth century is compelled to record the awful fact that, notwithstanding our great advance in hygienic and sanitary measures, and notwithstanding our increased knowledge of this devastating scourge, and all our prophylactic means, one-seventh of all deaths recorded are due to this disease.

Its habitat is found all over the world. Previous to 1810 the study of this disease had been principally a clinical one, and was regarded as a suppurative process, but with the advent of Bayle and his pupil, Laennec, the tubercle was studied as a distinct, anatomical growth. The cheesy gland gave way to a distinct nodule or tubercle.

From this new era its development has been more rapid. In 1865, Villemin startled the medical world with his experiments on rabbits and guinea-pigs. He inoculated these innocent victims of science with cheesy products and tubercular particles, and invariably produced tuberculosis, proving beyond all doubt its infectious character. He writes, "Tuberculosis is the effect of a specific causal agent, a virus." Repeated experiments by other investigators confirmed its infectious character, and from this time forth the search began for the infecting cause.

This Koch announced to the expectant world March 24, 1882, before the Physiological Society of Berlin, as the bacillus tuberculosis. Since then the profession has largely acknowledged the bacillus as the exciting cause, though some still contend the microorganism is the result and not the cause.

Zoological Distribution.—This disease, so fatal to mankind, is widely distributed among the animal world, especially domesticated animals; in fact, it is only found in wild animals after having been reduced to captivity, proving that environment is one of the predisposing causes of tuberculosis.

Of domestic animals, cattle are by far the most frequently affected, especially dairy cattle. Dr. Carpenter stated before the British Medical Association, held in Glasgow in 1880, that he was informed by a London meat inspector that 80 per cent of the meat sold in the London markets was tuberculous, and that, if this were all condemned, the inhabitants could not be fed. While this statement is most likely exaggerated, it shows that it is extremely common in cattle.

Swine are next in order of frequency, while sheep and goats are almost free from it. The horse is not often affected, though not exempt. Fowls are frequently troubled, though the tuberculous material is of a milder and less infectious character. Monkeys, when brought into captivity, are peculiarly susceptible, Forbes stating that 43 per cent dying in the London Zoological Gardens succumb to tuberculosis. Dogs and cats, for a long time considered proof against its ravages, are now found tuberculous, most likely from their close association with man. Rabbits and guinea-pigs, when domesticated, soon show the same tendency.

Geographical Distribution.—Tuberculosis is the most universal of all diseases, and is to be found in all parts of the world, perhaps more extensively in warm climates than cold; however, the local conditions figure more prominently than climate. Wherever large masses of people congregate, there tuberculosis prevails.

Altitude has a more deterring influence on tuberculosis than latitude, and at one time it was supposed that the high mountain regions' were exempt; and while the condition of the atmosphere is undoubtedly purer and more fatal to the bacillus, yet the fact, that the mountainous regions are more sparsely settled than the valleys, is not to be

overlooked, and were the summits of the highest ranges densely settled, we would, in all probability, find the disease very prevalent. Cities, then, with their teeming thousands, where many are crowded into close quarters, where the sun never enters, where foul and dark quarters house the submerged half, where malnutrition is the rule, and the unhygienic surrounding breeds disease,—these are the plague-spots of tuberculosis, and wherever these conditions are found, be it hot or cold, in valley or on mountain-top, tuberculosis will be found.

Etiology.—Predisposing Causes.—Heredity.—That a child born of tuberculous parents is very prone to become tuberculous has been recognized by the profession in all times, though till very recently it was denied that a child ever came into the world with tubercles already developed. It was believed that a child simply inherited an enfeebled vitality, which was unable to resist the encroachments of the specific infection; in other words, they furnished the soil for the reception and development of the virus, whatever that may be.

Lehmen, however, records a case of undoubted intra-uterine infection, and, as proof, found tubercles, in which the bacilli were found in great numbers, in the spleen, lungs, and liver of a child who died one day after birth, the mother having died three days after delivery, with tubercular meningitis.

Pregnant animals have been inoculated, and the offspring found to be tuberculous at birth. While this is undoubtedly true in rare cases, the fact is apparent to all medical observers that the heritage bequeathed by tuberculous parents, is a feeble vitality, feeble digestion, feeble assimilation, resulting in malnutrition—conditions favorable for the development of the disease.

Race.—Race is quite a factor in the receptivity of the infectious material. In the negro tuberculosis occurs more than twice as often as in the white race. The Indian is also very susceptible to its ravages, while Sears found 50 per cent of his cases to be of Irish descent. Perhaps the least susceptible of all peoples are the Hebrews, and no doubt their mode of life, which has been taught from generation to generation ever since Moses left his incomparable laws to his people, is largely responsible for this exemption.

Previous infectious diseases, such as la grippe, chronic bronchitis, measles, whooping-cough, typhoid fever, diabetes, etc., are often

followed by tuberculosis. They furnish the soil, which only needs the planting of the seed for its development. Children begotten of syphilitic and cancerous parents come into the world handicapped by a feeble vitality, and the conditions are favorable for tuberculosis.

Environment.—The surroundings, habits, and occupations also figure prominently as predisposing causes. Among that large class of the human race, known as the submerged half, their method of living is conducive to the disease. Herded together in close quarters, where the sun never finds its way, where foul air reeks with the poison given off from the filthy inhabitants, and where wholesome food is an unknown quantity, we find all the conditions favorable for the disease.

Dissipations of all kinds also tend to produce it, while occupations that are attended by inhaling irritant particles, render the subject peculiarly liable. Summing up the predisposing causes, we find that,—whether the result of heredity, such as tuberculous, syphilitic, or cancerous offspring, or from environment—poverty, drunkenness, or occupation, or from previous diseases, whether catarrhal or infectious,—they all produce the same result; viz., an enfeebled vitality, a poorly elaborated blood and feeble resisting power; and when the infectious material, whatever it may be, gains entrance into the system, the battle begins. The conservative forces of the body are marshaled for the fray, the leukocyte or phagocyte against the parasite. The weak succumbs to the strong, the bacilli come off victorious, and tuberculosis is established. The vitality having been reduced, the contest is a short one.

Exciting Cause.—The bacillus tuberculosis of Koch is now generally recognized as the exciting cause. This organism is a slender, rod-shaped body, straight or slightly curved, and, in rare instances, branched. Its average length is from one and one-half to three and one-half microns, or one-half the diameter of a red-blood corpuscle. After staining, it presents a beady appearance, which may be due to the presence of spores. (See frontispiece.)

It stains slowly with the basic aniline dyes, and what is peculiarly characteristic is its resistance to decolorizing agents, such as a twenty-per-cent solution of sulphuric or nitric acid, the bacillus of leprosy being the only other micro-organism possessing this same characteristic. It may be grown on blood serum, glycerin, agar, bouillon, or potato, but more easily on blood serum, which must be kept at 98°, the temperature of the body. It requires about two weeks for their development, when

colonies appear on the culture medium in the form of thin, grayish masses of scales.

Its vital tenacity is also characteristic, and, whether inside or outside the body, has great resisting power. These bacilli survive freezing and desiccation, and live indefinitely outside the body. In the body they are found in all tubercular masses, though in varying quantity, the greatest numbers being found in actively forming tubercle. Should a tubercular mass open into a vein or lymph tract, they will be found distributed to every tissue of the body.

Outside the body they are found principally in the sputum. Nuttall has estimated that several billion are thrown off daily by a phthisical patient during the advanced stage. The sputum drying, is reduced to dust by the friction that is constantly going on, and this dust permeates the atmosphere everywhere, settles upon furniture, draperies, carpets, the bed-linen, in fact, upon every article in the home of the afflicted, as well as upon walls and ceilings. When this dust is dislodged, it again floats in the air and is even then a source of danger.

The bacillus may be found in quite large numbers in the nares of people occupying or visiting these infected quarters. The chemical products resulting from the evolution of the bacillus and infected tissue has not yet been determined.

Mode of Infection.—The most frequent manner of receiving the infectious material is, undoubtedly, through respiration, and the minute bronchial tubes and lung are the first to show its ravages, although the nares and larynx follow in quick succession. At other times it gains entrance through the digestive apparatus, through infected meat and milk. Hereditary transmission, while possible (tubercles having been found in the fetus), is extremely rare and is most likely transmitted through the blood by way of the placenta. Inoculation may occur, by coming in direct contact, through cuts, fissures, excoriations, abrasions of any character, and generally assumes the character of tuberculosis of the skin.

Pathology.—Any organ of the body may be the seat of the disease, though some special parts are peculiarly susceptible. In the adult the lungs are the most frequently affected, while in children the lymph glands, joints, and intestines are the seat of election. The brain is also quite often the seat of the lesion, while the other viscera, liver, kidneys,

spleen, and heart are less seldom affected.

Tubercle.—The invasion of a suitable soil by the bacilli or virus, induces characteristic phenomena of the tissue-cells. The poison, whatever it may be, excites the connective tissue-cells, there is an increased proliferation of these bodies, while out from the blood-vessels migrate polynuclear leukocytes. In or near the center of this mass of cells, a few cells enlarge, either by fusion or by proliferation of their nucleus, and become giant cells; others near them enlarge, and are called epithelial cells, and this mass of cells constitutes a small nodule or tubercle.

It is non-vascular, and early undergoes necrosis. The origin of the giant cells is not very clear, but they are generally regarded as being developed from phagocytes, and are found more abundantly where the bacilli are few in number. The tubercle at first is of a grayish color, but very soon this turns to a yellowish hue, owing to the destructive changes that take place.

Caseation.—Either from a poison, developed by the bacilli, or from some other source, necrosis of the cells occurs, forming a cheesy condition known as caseation: at a later period this breaks down, forming an abscess, the cavity being filled with purulent material.

Sclerosis or Fibrosis.—Sometimes nature comes to the rescue, and a secondary inflammation arises contiguous to the mass; there is cell proliferation, and the tubercular mass is enveloped in a capsule or fibrous tissue. Sometimes the transformation of the tubercle is complete, leaving a hard, indurated, fibrous nodule.

Calcification.—At other times there is a calcareous deposit, and the tubercular mass is said to undergo calcification. We thus see going on in tubercular patients a war of forces,—the constructive arrayed against the destructive; and only as the physician succeeds in building up the vital forces, enabling the tissues to resist the encroachments of the bacilli or toxins, will he be successful in benefiting his patient.

Miliary Tuberculosis.—When the infectious material is distributed to all parts of the body through the general blood supply, we have the formation of small nodules, millet-seed in size, formed in the various tissues, though the distribution is unequal, being abundant in some organs, while few in others. This form generally results from the breaking down of an old lesion, either a lymphatic gland, a pulmonary

lesion, a tubercular bone-marrow, or the involvement of the liver or spleen.

Acute Miliary Tuberculosis.—Typhoid Form.—This form bears a striking resemblance to the infectious fevers, especially that of enteric fever, and unless the physician is familiar with the family history, where tuberculosis is well established, the diagnosis may not be confirmed till after death.

There is usually a period of incubation as in typhoid fever, though somewhat different. The patient notices that he is growing more feeble, is losing flesh, and is taking on a cachectic appearance. The appetite fails or is capricious, and the tongue is dry or furred. After days, or sometimes weeks, of progressive decline, the patient becomes feverish, though the temperature chart shows it to be different from that of enteric fever. It is irregular, and does not show the gradual “step-ladder” rise the first week, so characteristic of typhoid. In fact, there may be subnormal morning temperature, and in rare cases it is afebrile.

There is generally some cough, though not more marked than often attends enteric fever. The respiration is more hurried, and the pulse is small and rapid, rarely dicrotic. There may be active delirium, though more often the patient grows dull, and is inclined to be passive, sleeping much of the time. There is nausea, and sometimes vomiting. In the early stages there is constipation, but as the disease progresses, there is diarrhea, and where there are tubercular ulcers of the intestines, there may be some hemorrhage. There may be tympanites. There is no eruption.

As the end approaches, there is the Cheyne-Stokes respiration. The spleen is somewhat enlarged, though not so marked as in typhoid. This form is fatal, and a favorable prognosis should never be given.

Diagnosis.—While there is a marked resemblance to enteric fever, if the physician is careful he need make but few mistakes. During the period of incubation, there is a normal or subnormal temperature, the patient loses flesh and strength, and there is nearly always some cough. When the fever makes its appearance, it is irregular in character, not uniform. There is no eruption. The respiration is generally more rapid and the pulse never dicrotic; and, lastly, though perhaps I should say first, there is the family history, which generally points to tuberculosis as a primal factor.

Pulmonary Form.—The general symptoms embrace most of those already mentioned, plus a more marked pulmonary group. The first symptom noticed, is a cough which may have existed for months, and been regarded as “cold on the chest,” or, if a child, it frequently follows measles or whooping-cough. The fever is quite active, the temperature ranging from 103° to 104° or 105°. The respiration is increased in frequency, and is more or less labored. The face is inclined to be cyanotic, especially during or following an attack of dyspnea. The pulse is rapid and sometimes irregular. The cough resembles that of broncho-pneumonia, the expectoration is muco-purulent, and, if the inflammation is active, may be rusty-colored.

The physical signs are those of bronchitis or broncho-pneumonia. On auscultation, we hear sibilant rales, if there is but little secretion; or there may be fine, crepitant rales, telling of the gradual effacement of the air-cells by accumulation of mucus, or the deposit of tubercular material.

Diagnosis.—As in the preceding fever, the diagnosis is not easily made. The history of tuberculosis, coupled with the knowledge of a chronic cough, or following an attack of measles or whooping-cough, or diseased lymph glands; the marked dyspnea, the cyanotic appearance of lips, the high temperature, with rapid pulse,—are symptoms that point to this form of miliary tuberculosis.

Meningeal Form.—This form is perhaps more frequently found in acute tuberculosis than either of the other forms, or both combined. It occurs more frequently among children between the ages of two and six, though it may occur at any time of life. It was known by the older writers as hydrocephalus or dropsy of the brain.

The primary affection can very often be traced to tuberculosis of the lymph glands, while the exciting cause may be any of the infectious fevers incident to childhood, or the lesion may be regarded as arising from a fall.

The tubercles, especially in children, are deposited in the membranes at the base of the brain and in the sylvian fissure; becoming inflamed, a sero-fibrinous or fibro-purulent exudate is deposited, in which are found entangled the tubercles, varying in size from the microscopic to those plainly visible by the unaided eye. The meninges being affected

accounts for the symptoms resembling meningitis.

The disease may begin more or less suddenly, with marked cerebral excitement, or convulsions may usher in a severe form that may prove fatal in a few days. As a rule, the disease has a course of from two to six weeks in children, and from three to five months in the adult.

Symptoms.—*Prodromal Stage.*—This stage may last for some weeks, especially if following measles or whooping-cough or the infectious diseases of childhood. The child is cross and fretful, restless at night, the appetite capricious, the breath is bad, and the tongue is coated. The bowels are usually constipated. The child has occasional spells of vomiting, which can not be traced to wrongs of the stomach. The patient loses flesh and strength, the face has a pinched appearance, the eyes are contracted, and the child, if old enough, complains of pain in the head.

Stage of Cerebral Excitement.—These symptoms grow more pronounced till the stage of excitement is fully ushered in. Chilly sensations, accompanied by severe headache and vomiting, may usher in this stage. The pain in the head is often of an intense character, the child uttering a sharp, piercing, hydrocephalic cry. The face is flushed, eyes bright, and pupils contracted. The screams of the child may persist for hours or until the child is completely exhausted.

Vomiting, so characteristic of cerebral irritation, is a prominent symptom. The bowels are obstinately constipated. The fever is usually not very high, the temperature ranging from 101° to 103°, though sometimes it may reach 104° or 105°. The pulse is small and rapid during the early days of the fever, but grows irregular as the disease advances. With the progress of the disease, owing no doubt to the pressure caused by the exudate, the cerebral symptoms become more passive. The patient becomes dull and drowsy, the pupils, which at first are contracted, now dilate, and the child sleeps with the eyes partly open. There is twitching of the muscles, and retraction of the head, especially when the spinal meninges are involved. The respiration may become, irregular and sighing.

Stage of Paralysis.—This stage occurs as the patient nears the end of the struggle. The patient can not be aroused, lies with the eyes partly closed, and there is involuntary twitching of tendons and muscles. Paralysis of the third nerve is most common, which may involve the

face. Optic neuritis, together with strabismus or ptosis, is not uncommon.

Hemiplegia may occur. Osier records two cases of mono-plegia of the right side of the face, with aphasia. In rare cases a typhoid state develops, tympanites occurring with diarrhea. The tongue becomes dry, brown, with sordes on teeth and lips; low delirium follows, the urine and feces are discharged involuntarily, the temperature falls, and death ends the scene.

Diagnosis.—A history of old foci, especially of the lymph glands, so far as can be learned; the irregular course of the fever; the excruciating pain in the head, attended by shrill screams; the constipated condition of the bowels; the coma, twitching of various groups of muscles; and finally paralysis of certain parts,— render the diagnosis not extremely difficult.

Prognosis.—The progress is decidedly unfavorable, and though cases of recovery have been recorded, it may have been that a mistaken diagnosis could have accounted for the favorable termination.

TUBERCULOSIS OF THE LYMPH GLANDS.

Synonyms.—Scrofula; Struma; King's Evil.

For more than two thousand years inflammation of the lymphatic glands has been recognized under the head of scrofula, and, even at the present day, there are those who, while acknowledging a very near relation, are not quite ready to admit their identity. Certain it is, that tuberculosis of the lymph glands is of a much milder and less infectious character.

It took the name King's Evil from the prevalent idea that the touch of a king was curative. That enlarged glands were far more common two centuries ago than now, may be inferred from the number touched by Charles II. During twelve years of his reign (1702-1714), he is said to have touched ninety-two thousand, one hundred and seven persons, and as the methods of travel were primitive, these thousands were in all probability in the near-by districts.

The investigations during the past twenty-five years, however, have changed all this, and the medical profession now recognizes scrofula as

a form or variety of tuberculosis.

Etiology.—Anything that tends to lower the vitality of the lymph tissue is a predisposing cause. Poverty and environment are fruitful causal conditions, and tuberculosis of the lymph glands is much more common among the extreme poor than the well-to-do.

Age.—While this form may occur at any age, it is exceedingly rare after middle life, the greatest number of cases occurring among children.

Race.—The negro is peculiarly susceptible.

Catarrhal conditions of the mucous membranes render the patient far more susceptible than those otherwise affected. The germs lodge upon the mucous membranes in naso-pharyngitis, and readily find their way into the lymph channels, and are carried to the near-by glands. Tonsillitis, for the same reason, may be the forerunner of tubercular adenitis.

Eczema may furnish a rich soil for the reception of the germ, which in turn finds its way into the lymph current, and the glands receive the force of the poison.

Clinical Forms.—The various phases of this variety may be grouped under two heads: generalized tubercular lymphadenitis, and local tubercular adenitis.

Generalised Tubercular Lymphadenitis.—This form may involve the lymphatic system at large, while the viscera may escape. The cervical lymphatics are more frequently the seat of infection, though any group may be the source, and the general infection which follows might be regarded as secondary. Usually its course is chronic, though it may have an acute course.

Symptoms.—Although there is no evidence of lung trouble, the patient is going into a decline. There is loss of flesh and strength, the appetite is capricious, the tongue furred, and secretions are deranged. A fever, irregular in character, is a marked feature. Emaciation becomes marked, while the cervical and axillary glands become swollen, with a tendency to suppuration. In the general appearance there is a great resemblance to Hodgkin's disease.

Local Tubercular Adenitis.—Cervical.—This form is the most common of lymphatic lesions, either in the adult or child, and is peculiarly frequent among children of the poorer classes. Insufficient food, or, more properly speaking, improper food, together with bad air and unhygienic surroundings, as were seen but a few years ago in nearly all eleemosynary institutions, give rise to a large percentage of scrofula. Plow many of these cases were from tubercular parents could not be determined, though, if present in latent form, the poor surroundings and food early developed it.

The proof that environment was a productive cause is seen in the marked decrease of cases in the past few years, with a radical change in the care of these unfortunate waifs of humanity who are cast upon the public welfare. In fact, the records show[^] that most of the inmates are discharged at the present day in a far healthier condition than when admitted.

In Keating's Cyclopedia of Diseases of Children, a realistic picture of the condition of things wd-iich existed under the old regime is given as follows:

“Some years ago I had a very melancholy but convincing proof of the effects of improper food in producing scrofula upon five or six hundred children in the House of Industry (Dublin), of all ages. from a year to puberty. The diet of the children consisted of coarse brown bread, stirabout, and buttermilk, generally sour, for breakfast and supper; of potatoes and esculent vegetables, either cabbage or greens, for dinner; and sour buttermilk again for their drink. They were confined in their dormitories and schoolrooms of insufficient extent for their number, there being no playground for the children; consequently, they were deprived of that exercise, so natural and necessary for the development of the frames of young animals, and which might have enabled them to digest in some degree their wretched and unwholesome diet.

“Under this cruel mismanagement, they lost all spirit for exercise or play; and on visiting the rooms in which they were incarcerated, the air of which was impure to. a degree only to be compared to jails of former times, these wretched little beings were seen squatted along the walls of their foul and noisome prisons, resembling in their listless inactivity an account I have somewhere read of savages met w[^]ith in Australia, their faces bloated and pale, and their stomachs as they sat nearly touching their chins.

“Upon a closer examination of these children, it was found that, in general, the upper lip was swollen, the tongue foul, or sometimes of a bright-red color, indicative of acidity of the stomach, the breath offensive, the nostrils nearly closed by the swelling of the mucous membranes, the abdomen tumid and tense, and the skin dry and harsh; but, that which appertains most to my present subject, the cervical glands were more or less swollen and tender; and I am within bounds when I assert that nearly one-half of those unhappy children had the characteristic signs of scrofula in their necks.”

This form is also very common among the colored race.

Symptoms.—The first evidence in this, as in all other forms of tuberculosis, is an enfeebled vitality, and the various symptoms that arise from an imperfect elaboration of blood. The visible local manifestation is the enlargement of one or more of the cervical glands, usually the submaxillary. These are generally spoken of by the parent as kernels, and may remain quite small and firm for weeks, when, from cold or perhaps from some of the many unassignable causes, the vitality is still further reduced and a new activity is developed in the glands, which increase in size, varying from that of a walnut to that of an egg.

There is usually a greater development on one side than on the other. A low form of inflammation sets in, and deposits take place in the adjacent tissues, which become swollen and hard. The inflammation now becomes more or less acute, the part is reddened, painful, hot, tender on pressure, and the swelling increases rapidly. Continuing in this way for a longer or shorter time, suppuration commences, and the deposit is gradually changed to pus, which in time makes its way to the surface and is discharged.

This occupies a variable period of time, sometimes passing through all its stages in eight or ten days, and at others occupying as many weeks. In some cases the inflammation is acute and the pain severe, but in others it progresses without much redness, heat, or pain. The pus forms slowly in many cases, and there is but little tendency to its discharge, while in others weeks pass, the part still continuing hard; and at last, when our patience is nearly exhausted, suppuration occurs rapidly.

Sometimes the pus is well formed and healthy, and, when discharged, the part heals rapidly; at other times it is watery, of a greenish-brown

color, or clear, with more or less flocculent material mixed with it. Occasionally the abscess exhibits no tendency to point, but the pus burrows in the tissues for a long time, unless it is opened. In other cases, when the pus is discharged, the abscess does not heal, but continues to discharge a dirty flocculent pus; and if we examine it, we will find the walls ragged and often a chain of lymphatic glands dissected out and lying at the bottom.

The constitutional disturbance varies greatly. Sometimes there is quite a brisk febrile action when inflammation first comes up, with loss of appetite, arrest of secretion, and much prostration. In these cases suppuration is frequently marked with a chill or rigor, and occasionally attended by hectic fever and night-sweats. The fever may be very irregular, assuming either a remittent or intermittent type.

In other cases the only systemic disturbance is the gradual loss of flesh and strength, derangement of the secretions, a pallid or waxen appearance, with progressive emaciation. With the enlargement of the cervical glands the post-cervical, supraclavicular, and the maxillary may also become involved.

Tracheo-Bronchial.—This form is usually preceded by a catarrhal condition of the bronchial tubes, and may be primary or secondary to pulmonary infection; the primary form being especially common in children, Northrup recording affection of the lymph glands in every one of his one hundred and twenty-seven cases examined in the New York Foundling Hospital.

These glands are the catch-basins for the various debris which have escaped the destructive action of bronchial and pulmonary phagocytes; consequently, they become frequently infected, and undergo changes similar to those of the cervical glands; namely, become swollen, tumefied, and finally caseate or calcify.

In the advanced stage there is a tendency to form abscesses, which may rupture into the lung, bronchi, or trachea. These glands may assume quite a large size, though they rarely ever produce pressure sufficient to impair respiration.

Symptoms.—The general symptoms are those of impaired or enfeebled vital force. There is a progressive decrease in flesh and strength, and the general condition is well described as “going into a decline.” If

perforation of the lung, bronchi, or trachea has taken place, there will be cough, with expectoration of a cheesy purulent or bloody material. When secondary infection of lung takes place, the symptoms are those of phthisis.

Mesenteric.—Tabes Mesenterica.—This form is usually met with in children, and is rare after the age of twenty-one. It may be primary, when it is frequently associated with intestinal catarrh ; or secondary to tuberculosis of the intestines. The glands of the mesentery enlarging, caseate, though rarely followed by calcification or suppuration.

Symptoms.—The symptoms are those of malnutrition. In children it is usually preceded by diarrhea and gradually increasing prostration. The appetite is usually good, sometimes ravenous, but the patient receives no apparent benefit. The bowels are sometimes tumid, hot, and tender; at others very much shrunken; the evacuations, consisting of a thin mucus, greenish in color, and frequently resembling the washings of meat.

The countenance is contracted and pinched, the eyes set far back in the head, and the skin peculiarly dry, wrinkled, and sallow, giving the child a prematurely aged appearance. He is restless, irritable, and fretful, and presents many of the symptoms of cholera infantum.

In the adult there may or may not be diarrhea, frequently there is diarrhea alternated with constipation, and sometimes severe pain. There is a marked marasmus, increasing day by day; though the appetite may be good and the digestion seemingly well performed. The patient has an anxious expression of countenance; a sallow, wrinkled skin, contracted abdomen, and is uneasy, restless, and irritable.

In the latter stages diarrhea sometimes sets in, and carries the patient off quickly, or disease of the brain or lungs comes on to assist the tabes. In both cases the enlarged glands may escape detection, owing to the distention of the abdomen, due to the associated peritonitis, though where the abdominal walls are flabby the enlarged glands may readily be felt.

Diagnosis.—The diagnosis is not easily made in the early stage of the disease. As it assumes a chronic form, however, the child becomes thin, puny, and emaciated, despite the fact that the appetite has not failed and sufficient food has been taken to nourish the patient. These

symptoms, together with the persistent diarrhea, associated with more or less peritoneal involvement, and the enlargement of the mesenteric glands, which can be readily felt through the abdominal wall, render the diagnosis comparatively easy.

ACUTE PNEUMONIC PHTHISIS.

Synonyms.—Acute Phthisis; Galloping Consumption.

This variety occurs in persons whose vitality has been reduced by previous illness or who have led an exposed or dissipated life. While it may be primary, by far the larger number is secondary to a pre-existing tubercular focus, as of the lung, pleura, mesentery, or lymph glands. While it may occur at any age, it more frequently selects for its victims children or early adults.

Pathology.—The tuberculous deposits may be confined to one lobe, but more frequently the entire lung will be involved, or small tubercles will be found thickly distributed throughout both lungs. The part affected has the appearance of a hepatized lung, is heavy, and contains but little, if any, air. The exudate in the air-cells may caseate, break down, and form cavities. The pleura is usually covered by a thin exudate, which, breaking down, leaves a purulent material. See Fig 20.

Varieties.—Clinically, two forms are to be recognized, the pneumonic and the broncho-pneumonic.

Pneumonic.—**Symptoms.**—The disease often begins abruptly. The patient has been in apparent good health, though, when his attention is called to his previous condition, he can generally recall a progressive feeling of malaise and loss of vitality. The attack may be preceded by a cold, though, as a rule, the onset is sudden, as in lobar pneumonia.

Following the initiatory chill, the fever rises quite rapidly, the temperature soon reaching 104° or more. The skin is dry, the urine is scanty, and there is constipation. The face is flushed, tongue coated, and a harassing cough, with severe pain in the side, is quite characteristic. The expectoration at first is frothy and mucoid in character, but soon changes to the characteristic rusty sputum of pneumonia. The breathing is humid, and where a large portion of the lung is involved, there is marked dyspnea.

The physical signs are those of pneumonia; namely, the crepitant, followed by the subcrepitant rhonchus, with increasing dullness on percussion. The fever may be continued or assume the remittent type. By the eighth or tenth day, when in pneumonia we look for a crisis, the fever becomes irregular, the dyspnea increases, the expectoration loses its rusty tinge, becoming yellow and of a mucopurulent character or of a greenish hue. The expectoration is abundant, and raised with less difficulty.

Night-sweats now appear, and the rapidity with which the patient shows the inroads of the disease is remarkable. The emaciation is rapid, as seen in the hollow cheeks and pinched features. The course of the disease varies from four to eight weeks, though sometimes the disease may last from four to six months, when the symptoms are those of chronic tuberculosis.

Diagnosis.—The diagnosis in the early stage is extremely difficult, unless there is a history of gradual failing health, or tubercular taint. The early symptoms all point to pneumonia, unless there should be hemoptysis, which might arouse suspicion. In the course of a week or ten days, however, the disease assumes a more characteristic form. The irregular fever; the continued dullness on percussion; the thick, greenish, mucopurulent expectoration ; the rapid emaciation; the beginning of night-sweats,— are a group of symptoms that can not be overlooked.

Broncho-Pneumonic Form.—This form rarely attacks persons in good health, and the history shows a gradual decline. Chilly sensations, if not a marked chill, ushers in its presence, to be followed by a high fever. About this time hemorrhages may occur, which should arouse suspicion as to the nature of the disease. The fever is quite active, and a hard, irritating, bronchial cough, with pain in chest and lung, early manifests itself.

The expectorated material is at first a tough, viscid, glairy mucus, occasionally streaked with blood. As the smaller bronchioles become choked, the breathing becomes hurried and labored. The exudate fills the air-cells, and dullness is marked over the portion of the lung affected, usually the apex.

The breathing is now difficult, the expectoration is of a muco-purulent

character, night-sweats occur, emaciation is rapid, and “galloping consumption” is written upon the hollow cheeks, the pinched face, and the wasted frame. Sometimes, even after these grave symptoms appear, there will be an amelioration of all the symptoms, and the case passes into the chronic form.

In children the disease frequently follows measles, whooping-cough, scarlet fever, diphtheria, and influenza. The child, weakened by the infectious fever, is a fit subject for tuberculosis. The early symptoms are those of capillary bronchitis. The small bronchioles are first choked, and the lung complication soon follows. The child breathes with difficulty, and is disturbed by a hacking cough.

Weakened by previous sickness, the destructive forces rapidly do their work, and in from three to six weeks the little sufferer gives up the contest.

CHRONIC TUBERCULOSIS.

Synonyms. — Phthisis Pulmonalis ; Consumption; Chronic Pulmonary Tuberculosis; Chronic Ulcerative Tuberculosis.

Pathology.—A post-mortem will reveal quite a variety of conditions. The apices of the lungs are the most frequent seat of the tubercular deposit, and from here the invasion proceeds till more or less of the entire lung is involved. The earliest tubercular deposit is generally formed from an inch to an inch and a half below the apex, and nearer the posterior than the anterior surface.

The first effect of the bacilli or toxin, however, is felt in the smaller bronchial tubes. As the disease progresses, the air-cells become filled with the same products, which caseate, and when a section of the diseased part is made, we see a yellow or grayish surface. Later several of these nodules coalesce, forming a tubercular mass, which, undergoing necrosis, forms a cavity. These cavities vary in size and character. Some contain material of firm consistency; others, where the material is soft, lose all trace of organization; while still others contain a disgusting, purulent fluid, the result of mixed infectious material and broken-down tubercle.

The blood-vessels resist for some time the destructive force of the

tubercle, and it frequently happens that a cavity will be crossed by one or more blood-vessels. Later, even these give way, sometimes accompanied by profuse hemorrhage. Again there will be areas where the tubercles are encapsuled. The bronchial glands are enlarged and contain tubercles.

The pleura is nearly always involved, with a fibrinous exudation, and the walls are frequently thickened by adhesions and the presence of tubercles. Tubercular infiltration often takes place in the larynx, and rarely in the pericardium. There is usually fatty infiltration of the liver. The intestines show ulceration with infiltration in many cases.

Invasion.—Few diseases present such a wide range of symptoms as chronic tuberculosis. This is due to the various ways in which it begins.

Gradual Invasion.—In many patients the invasion is so gradual that it is with difficulty we can trace its beginnings. It has been noticed that the general health has been giving way, the appetite has been capricious, the secretions irregular, and the patient looks anemic, with an ashen color of face. The strength fails from day to day, the breathing is hurried after slight exertion, and the patient's condition is aptly expressed in the popular phrase, “going into a decline.”

The symptoms are those of malnutrition, and weeks, or even months, elapse before local symptoms are present.

Bronchitis or Influenza.—Next in frequency to the gradual invasion is an attack of bronchitis or influenza.

There may have been a catarrhal condition of the bronchial tubes resulting in frequent attacks of bronchitis, each lasting a little longer and being more persistent, the general health being gradually undermined, and, before the physician or patient is aware, tuberculosis has made its inroads.

Pleurisy.—Sometimes the first complaint is a sharp pain in the side, pleuritic in character; or a dry pleurisy, with friction murmur and pain in apex, may be first recognized: or the pulmonary lesion may foster an attack of pleurisy with effusion, and though this is gradually absorbed, pain remains in the apex or under the shoulder-blade, and the cough persists.

Laryngitis.—At other times it begins with a laryngeal irritation, loss of voice, a hoarse cough, and some soreness of the throat. Although the local symptoms are of the larynx, many times the foci are of the lungs, and such an onset should arouse suspicion in the physician, and cause him to make frequent and careful examination of the lungs.

Hemorrhages.—While hemorrhage from the lungs does not always signify tuberculosis, it should always be regarded with grave suspicion; for it may be the first evidence of the disease, the tubercular invasion of the lung already having begun,

In some cases, the disease progresses rapidly from the first hemorrhage; at other times there will be intervals of weeks or months between the hemorrhages, to be finally followed by phthisical symptoms.

Osler speaks of a few, but very important, class of cases where the disease makes serious inroads before there are any marked symptoms to betray the disease.

These latent forms usually occur among the laboring classes, and a man may work for some time with a cavity formation in the apex of his lung, and not be aware of it.

Malarial Fever.—In malarial sections it is not uncommon to mistake the earlier phases of pulmonary tuberculosis for malarial fever. The regularity of the chills, fever, and sweats masks the condition so true to life that the real lesion is overlooked.

Symptoms.—Since the symptoms are so varied according to the different modes of onset, a clearer idea will be gained by dividing the symptoms into two classes, local and general.

Local.—Cough.—One of the earliest, most persistent, and most important symptoms is the cough, which not only announces the early stage, but usually continues throughout the disease. At first it is generally dry, short, and hacking, to be followed by an expectoration of glairy mucus, requiring some exertion for its removal; this gradually changes to mucopurulent material.

The cough, not infrequently, occurs in paroxysms, which greatly exhaust the patient. There seems, however, to be but little relation between the severity of the cough and the gravity of the disease; for in

one person there is but little sensitiveness of the respiratory apparatus, though the lesion is severe, while in another, although the lesion is but slight, there is extreme sensitiveness. The cough is usually more pronounced in the mornings and evenings, and after partaking of food and drink, in the latter case often resulting in vomiting.

Pain.—Pain is the unpleasant symptom of any disease, and, if persistent, adds to the gravity of the case. While it may be absent from beginning to end, it is generally present at some stage of the disease. It may be a sharp pain in the apex, or a stitch in the side, especially on taking a full inspiration. If pleurisy be present, the pain is lancinating or stabbing in character. Again, a common location of the pain is under the shoulder-blade or between the shoulders.

Expectoration.—The sputum varies as to quantity, quality, color, consistency, and odor, depending upon the rapidity with which the destructive process takes place, and also the form, whether or not there be mixed infection. At first it is white and frothy, or glairy, tenacious, and streaked with blood. This soon changes to an opaque and yellowish color, soon followed by a mucopurulent material. At times there will be soft, cheesy particles of a grayish color, which aids one materially in the diagnosis.

Where cavities form, the sputum becomes heavy, lumpy, coin-shaped, nummular, and of a greenish-yellowish color. There is a slight, sweetish, sickening odor in some cases, while in others there is but very little. Where there is mixed infection, there may be marked fetor. In the earlier stages there may be considerable bronchial mucus mixed with the expectoration. In children and very old people the expectoration is very scanty.

In examining the sputum for bacilli, the grayish, cheesy particles should be taken, as they are rich in germs. To obtain elastic fibers, which is now regarded as of additional value, boil equal parts of the sputum and a solution of caustic soda; empty into a conical-shaped glass, and cover with cold water. The sediment can then be carefully examined for this product. Where calcification has taken place, there may be spit up with the mucus, particles of chalky material as large as a pea.

Hemoptysis.—Hemorrhage from the lungs varies very greatly in quantity and time. Some patients pass through all phases of the disease without the suspicion of a hemorrhage. Other patients will show this

alarming condition early in the disease, but as the case advances it disappears entirely; while another class of patients will “spit blood” more or less frequently during the entire progress of the disease.

In the early stages the hemorrhage is rarely ever profuse and never dangerous, while those occurring in the advanced stage may prove fatal, though this is very rare. The blood is usually bright red and frothy, characteristic of hemoptysis. The mucus may be simply streaked or tinged with blood, or it may be decidedly rusty. Hemorrhage most frequently occurs after mental excitement, or physical exertion, or paroxysm of coughing, though sometimes it occurs without any apparent cause. Thus, in one of my patients, the hemorrhage invariably occurred in the night, he being awakened by a choking sensation, which was due to the pressure of the blood.

In the milder forms it follows the cough, while at other times it seems to flow to the upper part of the larynx and into the pharynx, and is simply spit out. The hemorrhage is due, in the early stages, to hyperemia, and the blood exudes from the feeble vessels, most likely, due to pressure from tubercular deposits. After cavity formation, there may be erosion of a larger vessel, when the hemorrhage becomes alarming and very rarely fatal. In a practice of twenty-five years I have met with but one fatal hemorrhage in this disease; this in a child ten years old, who died in five minutes after the rupture of the blood-vessel.

Hemorrhage from the lungs, while not necessarily an evidence of tuberculosis, should always be regarded with grave suspicion, and cause careful and repeated examinations on the part of the physician.

Dyspnea.—In the early stage of the disease there is little suffering from “shortness of breath,” unless preceded by active exertion. In the later stages, however, it often proves one of the most distressing conditions.

General Symptoms.—*Fever.*—One of the earliest symptoms, even before the cough, is an elevation of temperature, and if it remains constant for days, with a progressive decline in health, it is one of the most reliable evidences of the dread disease. The first evidence of the toxin in the blood is to produce fever, which varies in character. In one it will be of the continued type, while in another it will be remittent or intermittent in character, or again partake of both, being decidedly irregular. In fact, the irregular character of the fever in tuberculosis is one of its characteristics.

The continued form prevails more frequently during the early stage, while the remittent is found during the later stages. When cavity formation occurs, attended by profuse night-sweats, the intermittent prevails. The intermittent is also seen in the early stage, if the patient has been subject to malarial fever, or lives in a distinctly malarial section, and care must be taken not to mistake this intermittent fever for a paludal fever.

Pulse.—The pulse is increased in frequency, is small, easily compressed, and in the later stages may be sharp and wiry.

Anemia.—The enfeebled vitality is accompanied by feeble digestion and assimilation. As a result of the excess of waste over supply, and the imperfect elaboration of blood, anemia is a necessary result. The pale or ashen color, often made more prominent by the bright red, hectic flush of cheek, is recognized, even by the laity, as belonging to phthisis.

Night-Sweats.—While night-sweats may appear early as the result of enfeeblement, it is more marked during the cavity formation period. At first these are but slight, the head and neck becoming moist, then confined to the thorax and upper extremities. At times they become very profuse, and the night-dress, and even the bed-clothing, are quite wet. These usually come on after midnight, in the early morning hours, though they may occur during the day when the patient drops asleep.

Emaciation.—Another characteristic of phthisis is the loss of flesh. Several factors combine to bring about this result. First the fever, for during any fever the waste exceeds the supply, and consequently there is general atrophy. This is doubly true in phthisis; and in all those cases where there is seeming improvement, where the patient, for a brief period, gains in weight and strength, it will be found to take place during the afebrile stage.

Loss of appetite, whereby insufficient food is taken to counteract the waste, is common. The early enfeeblement of all the forces is seen in a feeble digestion and assimilation. The result is, that the tissues are rapidly used up, without a corresponding renewal. The emaciation is in the adipose tissue first, and then the histogenetic. Where the fever is prolonged for months, it is extreme, and the patient becomes a veritable living-skeleton. With the loss of flesh there is a corresponding debility.

Gastro-Intestinal Disturbance.—The stomach early feels the force of the toxin, which is seen in the furred tongue. There is frequent nausea and sometimes vomiting, especially in the advanced stages and after a paroxysm of coughing. Often the tongue, which is narrow, elongated, reddened at tip and edges, speaks of an irritable stomach, which is attended by some pain and tenderness in the epigastric region. Small ulcers in the mouth are frequent, and are annoying to the patient.

Diarrhea.—While diarrhea may occur early in the disease, it is usually found in the advanced stages, and is one of the serious complications, adding greatly to the prostration. These unfortunates often have painful hemorrhoids or fistulas, which later increase the suffering and still further lower the vitality of the already reduced system.

Nervous System.—“Hope springs eternal in the human breast,” is certainly true in this class of patients, and they are ever planning for the time when they shall regain their health, are easily encouraged with any favorable symptom, while changes for the worse are regarded as only temporary. Derangements of the nervous system are quite rare.

Complications.—An acute pneumonia is not an infrequent complication, while a diseased pleura is nearly always found at some stage of the disease. One of the most distressing complications is the involvement of the larynx. The husky voice or persistent attempt to clear the throat announces its presence. As the disease extends, aphonia becomes more complete, and the patient swallows with difficulty. Finally when ulceration extends to the epiglottis and walls of the pharynx, swallowing is no longer possible, food and fluids return through the nose, and the patient literally starves to death.

Physical Signs.—*Inspection.*—The eye reveals, to the skilled physician, definite and important conditions, characteristics that either tell of phthisis or of one susceptible, to the disease.

The chest is long, narrow, and flat, with increased width of the intercostal spaces. The scapula stand out prominently like wings, while the epigastric angle is usually acute. Where cavity formation has taken place, there is flatness, the most frequent place being over the left apex. We are to remember, however, that part of this is due to atrophy of the chest muscles. This chest is known as the “paralytic” or “phthisical chest.” The respiration is diminished in all stages, but particularly over the apex.

Palpation.—The expansive power observed in inspection can be verified by palpation. By placing the palms on corresponding-ports of the chest, one can readily gauge the expansive power of each. Especial attention should be paid to the clavicular areas, both above and below the clavicle. Vocal fremitus will be increased over the infected area, while the sense of touch reveals tactile fremitus. At the base this vocal fremitus may be diminished or entirely absent, due to a pleural exudate.

Percussion.—The normal resonance is masked in proportion to the defect in expansion and areas of tubercular deposits. The early changes will be noted immediately above and below the clavicle. Similar points of the two sides must be compared both during inspiration and expiration and while breathing is suspended. Areas for careful examination are the supraspinous fossa and interscapular space.

Where the early deposit is near the surface, dullness will be recognized, but where the deposit is deep-seated and surrounded by emphysematous cells, the condition may be overlooked. When the cavities of the apex are thin-walled, the “cracked pot” sound will be heard. If carefully performed, much may be learned by percussion; but if carelessly done, but little information will be gained.

Auscultation.—If carefully performed, the knowledge obtained by auscultation is a valuable aid in diagnosis. Feeble respiratory sounds replace the normal rhythm in the early stage, and are suggestive as to the condition of the apices, or there may be a prolonged expiration during the early stage; while an interrupted respiration, the “cogged-wheel” form, may replace those already mentioned.

We are not to forget, however, that feebleness of respiration may be due to pleural exudates or thickening of the chest-walls, by tumors, edema, etc., and that prolonged respiration, while important, may result from a certain degree of bronchial narrowing, which, while it does not prevent a free entrance of air, hinders its exit, and that the interrupted or cogged-wheel breathing may occur in bronchitis.

As the disease advances, the inspiratory murmur becomes harsh, changing to a bronchial or tubercular character as consolidation increases. On deep inspiration, there may be a few dry clicks, evidence of unsoftened tubercle. With the progress of the disease there is increased secretion in the bronchial tubes, the result of progressive

bronchitis, and crepitant and subcrepitant rales are heard. When the secretion is profuse, there is a loud mucous rhonchus. As cavities form, the cavernous and amphoric sound is heard. As the pleura becomes involved, pleuritic friction is heard.

Signs of Cavities.—While large cavities are generally easily recognized, there may be cavities that have never been discovered during life. We may be quite sure of a cavity, if persistent bronchial breathing occurs over a limited area combined with little dullness on percussion. The cracked-pot sound is heard when a cavity connects with a bronchus and is superficial.

In well-developed cavities gurgling rales may be heard, and the breathing is amphoric in character. Vocal resonance is frequently increased. Wintrich first called attention to the increase of the tympanitic character of the percussion note, when the mouth is opened and closed, also to change of position. Retraction in the interclavicular region becomes prominent when the cavity is in the apex. Where a cavity is empty and superficially located, vocal fremitus is increased. Pectoriloquy is often heard with these conditions.

Diagnosis.—It is essential that we make as early a diagnosis as possible; for, if recognized in its incipiency, there is some hope of effecting a cure, especially if the patient is in a position to profit by the suggestions of the physician as to change of environment, change of climate, etc.

When a patient shows a progressive decline in flesh and strength, with a daily elevation of temperature from a half degree to a degree and a half, a hacking cough, more severe on rising in the morning, occasional pain in chest, particularly over the apex, and if he has had a hemorrhage, the case is decidedly suspicious. In such a case the sputum should at once be examined, and if the bacilli are found, the diagnosis is quite certain.

The presence in the sputum of elastic fibers shows the destruction of the lung tissue has begun, and is additional evidence of the dread disease. When the disease has progressed sufficiently for cavities to form, the chest to become flat, night-sweats to appear, and emaciation to become marked, the diagnosis is of but little use, as the destructive changes are so marked that but little if any benefit can be expected from medication.

Fibroid Phthisis.—*Definition.*—Fibroid phthisis is that condition where the normal lung" tissue is replaced by fibrous connective tissue, resulting in contraction and induration, and where a microscopic examination reveals tubercle. Chronic interstitial pneumonia is now classed as fibroid phthisis, there being no tubercle present, at least not till near the end of the disease.

Pathology.—The replacement of lung substance by connective tissue usually begins in the apex, more rarely in the middle lobe, and gradually extends downward till the whole lung is involved. As the disease progresses, the lung becomes contracted and indurated. As a result of this, the chest of the affected side becomes flat, and the shoulder drops. But one lung may be affected, the opposite fellow becoming hypertrophied as a compensation. There is often dilatation of the larger bronchi and thickening of the pleura.

Symptoms.—The symptoms depend, to some extent, on the manner in which it begins. Thus Clark Hadley and Chaplin describe three forms of the disease: first, a pure fibroid phthisis, where no tubercle exists; second, a tuberculo-fibroid, where the tubercle develops first, to be followed by the connective tissue; and, third, the fibro-tubercular form, where the tubercle follows the fibroid change.

Cough is one of the earliest and most persistent symptoms, coming on in paroxysms, and attended by expectoration of a mucus, sero-mucus, or purulent material. The paroxysms are more persistent in the morning. There is but little if any fever. The patient gradually loses flesh and strength. There is some pain in the affected side, and dyspnea follows slight exertion.

On inspection, we notice that the affected side is flat or sunken, and that the shoulder droops. Auscultation reveals a bronchial sound, while percussion gives more or less dullness, the result of induration and the effacement of the air-cells. Where tubercles are present the symptoms are similar, with the addition of a slight fever and a more purulent expectoration. Sweating is not so profuse in the fibroid form as in the ulcerative phthisis, but hemorrhages are more frequent and also more serious. Albumen is often present in the urine, and dropsy is frequently seen, especially of the feet, and occurs in the later stages. The disease is decidedly chronic, lasting from ten to thirty years.

Diagnosis.—The diagnosis is not always easy. Coming on insidiously,

with little or no fever, the disease is not early suspected. The persistent paroxysmal cough, the frequent hemorrhage, the dyspnea on slight exertion, the pain and sinking in the affected side, with drooping of the shoulders, are symptoms that determine its true character.

Tuberculosis of the Serous Membranes.—Tuberculosis of the serous membranes, pleura, peritoneum, or pericardium, may be either primary or secondary, though many times it will be very difficult, if not impossible, to distinguish the one from the other.

Pathology.—The anatomical changes are the same as those that take place in ordinary inflammations of serous membranes, with the addition of tubercular material, distributed throughout the exudations. The effusion is generally fibrinous, changing to a purulent character with the advance of the disease; at times it is hemorrhagic.

Etiology.—This form is acute, is usually the result of local disease of the bronchi, mediastinum, or, if in woman, of the fallopian tubes, inoculation taking place through these parts. If chronic, it generally follows the extension of tuberculosis of some contiguous organ.

The Pleura.—Symptoms.—These will depend upon the form, whether acute or chronic. If acute, the invasion may be sudden and announced by a chill, followed by febrile reaction. The breathing is shallow and attended by sharp, lancinating pains. A short, dry cough adds to the suffering of the patient. The symptoms, in the early stage, are the same as those found in acute inflammation of the membrane.

The chronic form comes on more insidiously, and is the result of extension from the pulmonary lesion. In addition to the general symptoms which have preceded, there is pain of a more or less acute character and a sense, of fullness of the affected side. All the symptoms of the combined lesion are now intensified, and the disease runs a rapid course.

The Pericardium.—This form may be acute or chronic, and may occur at any period in life. The morbid lesions are the same as those just considered. The acute form is rarely primary, and follows an affection of the bronchial or mediastinal lymph-glands. As these glands are more frequently involved in children, this form will be more often observed in young people. The symptoms, either acute or chronic, will be similar to those of acute or chronic pericarditis. In addition, there will be the

general and progressive emaciation, together with the destructive changes so familiar in general tuberculosis. This form is not frequent.

The Peritoneum.—This form is usually found as an extension from some adjacent viscera, though in rare cases it is seen as a primary lesion. It is often part of a general miliary tuberculosis, though the chronic ulceration and fibroid are not uncommon. The young are far more susceptible than the old, and it is comparatively rare after middle life, though no age is exempt.

The negro race is more prone to this disease than the white race, and females than males, owing to the frequency with which the fallopian tubes are the seat of the primary lesion.

The disease is very often the result of tuberculosis of the intestines or of the mesentery; again we see it following tuberculosis of the liver and pleura. Peritoneal involvement is not a rarity.

The frequency with which disease of the ovaries and tubes occur, has already been mentioned.

Symptoms.—The symptoms are not unlike those of tabes mesenterica; in fact, are often preceded by disease of the intestines and mesenteric lymphatics. They are also those of peritoneal effusion in general.

Among the local symptoms are tympanites, pain more or less intense, tenderness on pressure, and sometimes a well-outlined tumor of a plastic exudation can be outlined.

Among the most prominent general symptoms are emaciation and anemia.

The temperature varies, though usually not very high; while a subnormal temperature not infrequently accompanies the lesion.

Anders regards pigmentation of the skin as a prominent symptom, and one that should early attract the physician's attention to the peritoneal condition. Ascites is frequently present, though the effusion is not often large.

Diagnosis.—Unless the peritoneal involvement is preceded by tuberculosis of some other part, as the pleura, lungs, intestines, or pelvic

viscera, the diagnosis is extremely difficult, especially if the temperature range is nearly normal. If there is a continued elevation of temperature, and a transverse tumor below the transverse colon, with emaciation and anemia, there should be but little trouble in the diagnosis.

Tuberculosis of the Alimentary Canal.—*Of the Lips.*—This is a very rare site for tuberculosis, and when it is, it is usually as an ulcer associated with pulmonary or laryngeal disease. The ulcer is extremely sensitive, and not unlike a chancre or epithelioma. It is only recognized by the aid of the microscope.

Of the Tongue.—This, like the preceding, is usually associated with disease of the larynx or neighboring parts. It occurs as an irregular ulcer at the base of the tongue, though in rare cases the tip may be involved. It closely resembles a syphilitic ulcer, and requires great care in the diagnosis. The salivary glands seem to possess an immunity, though not quite absolute, as cases have been recorded.

Of the Palate.—This is seen in the form of miliary tuberculosis, and appears as a superficial ulceration of the tonsils, which requires a microscopic examination to reveal its true character. Like those just considered, it is commonly associated with tuberculosis of other parts, through the pharynx. In phthisis pulmonalis, during the latter stages, it is not uncommon to have ulceration of the larynx and epiglottis as a complication, and where this takes place the pharynx is nearly always involved. The ulceration is not always extremely painful, but often renders deglutition impossible, and the fluids are returned through the nose. The last days of life are rendered distressing, and the patient literally starves.

Esophagus.—The few cases recorded have been the result of extension from the larynx.

Stomach.—This rarely, if ever, is seen as a primary lesion. It may occur as a miliary or chronic caseous variety. The ulcers may be single or multiple, and involve the mucosa, though perforation has been recorded. The symptoms are pain, nausea, and vomiting, especially after eating. These symptoms may exist with tubercular laryngitis; but if hemorrhage occurs with the vomiting, and there be tuberculosis of the other parts, the probability is that there is tuberculosis of the stomach.

Intestines.—This, in the adult, is nearly always secondary to

tuberculosis of the lungs, about fifty per cent of chronic ulcerative phthisis having- this as a complication. In the child, however, it is frequently seen as a primary lesion or following a peritoneal disease. Any part of the small or large intestine may be involved, the ileum being the favorite seat of the location. This variety, together with enteric fever, is the common cause of the ulceration of the intestines. Beginning in Peyer's patches, the tubercles are formed, caseate, turn yellow, and suppurate, forming ulcers. These are irregularly oval, their, greater diameter being in the short axis of the bowel.

The symptoms are those of catarrh of the bowels, especially in children; with the diarrhea, there is colicky pain, and the stools consist of blood, pus, and fecal matter. There is fever, and the emaciation is marked. Night-sweats occur, and the evidence of tuberculosis can hardly be overlooked. In such cases the lungs should be carefully examined for tuberculosis.

Tuberculosis of the Liver.—Tuberculosis of the liver is almost invariably secondary to lesions of other organs; namely, of the lungs, pleura, or peritoneum. It is generally of the miliary form, and the distribution is quite general. The liver is pale and slightly enlarged, the tubercles are yellow, both being stained from the bile and necrosis. Hanot describes a tuberculous cirrhosis where the tubercle is entangled in connective tissue and fatty degeneration. “The liver is lobulated and furrowed by fibrous glands, which almost convert it into a lobated liver.” If the patient has been a hard drinker, there often is seen the fatty hypertrophic, tuberculous liver, which is characterized first by gastrointestinal disorders, hyperemia of the liver, cough, fever, and night-sweats, to be followed later by pronounced hepatic disorders.

The diagnosis is made by a careful physical examination of the liver, which will be found to. be enlarged, firm, hard, and irregular. Pressure causes pain, ascites may be present, while the symptoms of perihepatitis and peritonitis are nearly always present.

Tuberculosis of the Genito-Urinary System.—The attention of the profession has been directed to the genito-urinary tract in recent years by the surgeon and gynecologist as a seat for tuberculosis. Although rare, it may be primary or secondary, and may be either miliary or caseous. Any part of this system may be involved, and sometimes the extension is so rapid that the primary seat can not be determined.

Tuberculosis of the Kidney.—Tubercular nephritis is that condition where the tubercle bacilli develop in the inflammatory products, resulting in the formation of tubercular tissue. The inflammation usually begins in the mucous membrane of the pelvis and calices, gradually extending to the parenchyma, till more or less of the organ is replaced by the degenerated material. The tubercle may caseate and soften, or calcification may occur, the intervening space being converted into fibrous tissue. The other kidney is very apt to become involved, if not tuberculous, at least by a low form of nephritis and more or less of degeneration of its tissue and blood-vessels. Tubercular nephritis may be complicated by tuberculosis of other parts of the genito-urinary tract, by tuberculosis of the peritoneum, or, in fact, by tuberculosis of any other part of the system.

Symptoms.—The urine is more or less scanty, and contains, at different times, blood, pus, epithelium, tubercle bacilli, and, when the other kidney is the seat of chronic nephritis, albumen and casts are present. Pain of a dull, aching character over the affected organ may be constant, or there may be paroxysms, occurring at intervals. The kidney may become enlarged, so that the tumor mass may be readily felt. As the disease advances, the general symptoms characteristic of tuberculosis are seen; viz., hectic fever, night-sweats, and general emaciation.

Tuberculosis of the ureters and bladder may be a complication extending from the kidney, but rarely, if ever, occurs as a primary lesion. The same may be said of the prostate gland and vesiculse seminales.

Tuberculosis of the Testicle.—This form of the disease may be either primary or secondary, and occurs more frequently in early life than in later years. In twenty cases reported by Julian, twelve were under two years of age. Tubercle of the testes is most often confounded with malignant growths and syphilis. A careful examination of the body at large and a complete family history are important, before a diagnosis is made.

Tuberculosis of the Fallopian Tubes, Ovaries, and Uterus.— These organs are usually involved secondarily, although, in rare cases, they are the seat of the primary lesion. This is especially true of the tubes, while that of the ovary and uterus will always be found in connection with general tuberculosis.

Tuberculosis of the Circulatory Apparatus.—This occurs as the result of the pulmonary lesion, and is not found as a primary disease.

Diagnosis.—If the bacilli of Koch is the real cause of tuberculosis, as generally accepted by the profession, the most certain diagnostic feature would be the finding of the bacilli in the sputum and other excretions. The reaction obtained by injecting tuberculin is also regarded as positive evidence of the presence of tuberculosis.

The family history is of great value in the early stages. The increased temperature, the gradual loss of flesh and strength, the general evidence of malnutrition, the hectic fever, night-sweats, the cough, hemorrhage, and emaciation confirm and render plain the diagnosis.

Prognosis.—While tuberculosis is generally regarded as one of the incurable diseases, we are to remember that it is not necessarily fatal; that the presence of the bacilli does not mean that tuberculosis has become an established fact. These micro-organisms may gain entrance into the system, but, failing to find a soil suitable for their propagation, are cast out, and but little harm results.

Post-mortem examinations have revealed again and again the presence of healed foci, showing conclusively that persons have recovered from tuberculosis. When, then, may the prognosis be favorable, and when unfavorable? Certain forms are less destructive, and the prognosis may be quite hopeful.

Tuberculosis of the lymphatics and also of the osseous system do not seem to possess the virus in such a malignant degree as other forms, and the tendency is often toward health. Tuberculosis of certain organs which can be removed by the surgeon, may be permanently relieved, such as bone affections, the mammary gland, the ovary, the uterus, the testicle, and glandular enlargements. These may be said to be the hopeful cases. Also when the family history is of good report and the previous health of the patient has been good; when digestion and assimilation are first-class and the elaboration of a good blood is going on. With these conditions the germs fail to make headway, and the prognosis is good. Also where the temperature remains normal or rises for but a short time each day, and where there is no hemorrhage.

An unfavorable prognosis would be where the conditions were just

opposite to those above mentioned. Bad family history, gradual and progressive debility, feeble digestion and assimilation, hemorrhage repeated at intervals, cough more aggravated at night and early in the morning, and rapid emaciation,—these are conditions which would be recognized as unfavorable and almost necessarily fatal, especially where the environments are bad.

Treatment.—*Prophylaxis.*—If the generally accepted theory is true, that the bacillus is responsible for the disease, then all will agree that the destruction of the micro-organisms is one of the most important steps in preventing, not only the further spread of the disease, but also in limiting its ravages where it already has a foothold, thereby preventing reinfection.

It has been estimated that a patient suffering from pulmonary tuberculosis will expectorate, during the twenty-four hours, about seven billion of the bacilli; this from a patient who is still able to walk about and mingle with his fellow-men. The disgusting habit of expectorating on the floors of rooms, street-cars, and public buildings and sidewalks, should be discouraged by every means possible. The danger from this source should be taught in every school, and the children be impressed with the fact that herein lies one of the greatest menaces to the human family; for this is the one disease that is the scourge of humanity.

Patients confined to the house should be provided with spit-cups that can be easily cleaned or burned. If walking about, Knopf's pocket sputum-flask, made of aluminum, is very desirable. The sputum, when not burned, may be treated with a five per cent solution of carbolic acid, which successfully destroys the germs in thirty seconds. All utensils for sputum and secretions should be thoroughly boiled or cleansed with this acid solution.

Spitting in the handkerchief should also be discouraged, unless they are Japanese paper handkerchiefs and are immediately burned. Patients should also be instructed not to swallow any of the sputum, and thus avoid reinfection. Consumptives and all delicately inclined should avoid smoking, as there is danger in the virus coming from the consumptive cigar-maker, whose saliva is used to point the cigar. Dr. J. C. Spencer, of San Francisco, has demonstrated the presence of bacilli in various specimens of cigars, and though the nicotine may kill the germs it has also been proven that the dead bacilli contain a specific poison which is still capable of doing harm to the tissues.

Milk being a common source of infection, should be boiled or sterilized before use by the tubercularly inclined patient. The same may be said of tubercular beef, it should be thoroughly cooked. Kissing should be discouraged among all phthisically inclined, for while the virus is generally found more virulent in dried sputum, the breath from any diseased person can not be said to be health-producing. Where the sewage is defective, the excretions should be treated with carbolic acid solution before being emptied in a vault or even buried in the ground.

Delicate babies should not be intrusted to a wet-nurse unless it is known that she is perfectly free from tuberculosis; neither should they nurse from a tuberculous mother. Those phthisically inclined should live much in the open air, and all indoor occupations should be discouraged; also such trades where fine particles of dust are inhaled. Delicate children should be carefully guarded during the convalescent period of infectious disease, as the danger of tubercular infection is much greater at this time.

The diet should be wholesome, and sweetmeats, pastries, etc., should be restricted. Such exercise and gymnastics should be encouraged as develop the respiratory muscles and increase lung capacity.

To avoid frequent colds, the throat and neck should be bathed in cold water daily, followed by brisk rubbing with coarse towels. When possible, the sleeping apartment should be roomy and well ventilated, and the patient should sleep in a single bed. A change from the city to the country, or, better still, to a high and dry altitude or to an equable climate, is to be recommended where such advice can be followed.

In selecting a change of climate, one should go where there is a maximum of sun and a minimum of moisture, and where the temperature is equable. Such a climate is ideal for the tubercular patient. He must be much in the open air. Such a climate may be found in Arizona, New Mexico, and Southern California. Colorado has also earned a well-deserved reputation for respiratory diseases. Many are permanently benefited by a sojourn in the Adirondacks, while the mountains of the Carolinas and Georgia have proved curative. Texas, with its wide extent of territory, furnishes sections where tuberculosis is unknown and where patients recover.

Where, with such a wide range of territory, shall we send our patient?

This is not always easy to determine. If the patient be fairly robust, the Adirondacks will be ideal, as will be Colorado; if more delicate and less able to resist shock, the sunny, dry, and equable climate of New Mexico, Arizona, or Southern California, will be more desirable. In fact, much depends upon the effect that the climate has upon the individual. If it improves the appetite, enables the patient to sleep, and invigorates generally, and the patient increases in flesh, he has found his climate, and should abide there; if, on the other hand, there is no gain in flesh, the patient sleeps poorly, and the appetite is not increased, he must move on; but wherever he goes, he must be much in the open air.

After cavity formation, hectic fever and night-sweats appear, the patient should not be allowed to leave home, as the change usually hastens the fatal termination, and, besides, depriving him of the comfort and pleasure of home and friends during his last hours.

Treatment of the Disease.—The treatment of tubercular patients will depend largely upon the stage of the disease. In the earlier stages our object would be to improve the general health, and get a better elaboration of blood; in other words, to raise the vital force of the individual to such a point that the soil will not grow or develop the poison or germ, and in this way bring about a cure. Thus it is a question of nutrition.

Hygienic measures will form a great aid in the curative action of remedies; for I believe that very many cases, if seen in the early stages, can be cured. The treatment is usually quite plain. A little medicine; plenty of pure, fresh air and sunshine; gentle exercise, not enough to produce weariness; a tonic for the digestive apparatus; means to establish the secretions; a remedy for the cough,—and the patient, if curable, will soon show the effects of the treatment.

One great axiomatic truth that the physician should never lose sight of, is that any remedy which disturbs the stomach should at once be withdrawn. A good appetite and a good digestion are requisite for improvement; hence codliver-oil should seldom be prescribed. Once in perhaps a hundred cases, will you find a patient who can take codliver-oil and not disturb his stomach, and for such patients this remedy is permissible. Nevertheless I am inclined to believe that good, sweet breakfast bacon, and the fat of beefsteak and roast-beef, will prove just as efficient as the oil, and is at the same time not only more palatable but more easily assimilated.

Creosote is another agent which must be carefully administered or gastric disturbance will follow, which will be far more harmful, than the slight benefit derived from the remedy.

Arsenic is one of the agents which we will very early administer in the disease. Fowler's solution, twenty drops in four ounces of water, a teaspoonful every four hours, will prove of great benefit.

Veratrum.—These two remedies, Fowler's solution and veratrum, were almost invariably used by the late Dr. A. J. Howe. His method was to give arsenic one day and veratrum the next, and his success with these remedies was very marked. Veratrum is given in this case, not as a sedative, but for its alterative effect, there being few better remedies.

Nux Vomica and *Hydrastis* will be found useful where the appetite is poor and digestion feeble.

Howe's Acid Solution of Iron.—Where an acid is indicated,—red tongue, and mucous membranes,—drop doses of this preparation three times a day, will be found beneficial. It sharpens the appetite, and tends to arrest the excessive waste of tissue.

Cough.—The cough is one of the most distressing features of the early disease. Stillingia liniment in drop doses is very effective in relieving this troublesome symptom. A drop on a lump of sugar every one, two, or three hours, will secure rest from cough, and also restore the voice. In some cases it will give better results used as an inhalation. Squeeze a sponge out of hot water, and drop a few drops of the liniment upon it, and then hold over the mouth.

If there is pleuritic pain with the cough, bryonia will be found useful. In the later stages, codein and ipecac will give relief, but heroin, one-twelfth grain, every three, four, or five hours, will prove the most successful in the advanced cases.

For the fever, frequent sponging with warm water, and, incidentally, the indicated sedative should be given.

Night-Sweats.—Aromatic sulphuric acid, from ten to thirty drops at bedtime, is found useful. Also 1/100 grain doses of atropia. Camphoric acid in twenty-grain doses has proven quite beneficial. Picrotoxin in

1/60 grain doses may also be given with benefit.

Diarrhea.—Subnitrate of bismuth in mint-water, or the sub-gallate bismuth with opium, will prove reliable agents for this troublesome complication.

Hemorrhage.—Gallic acid in five-grain doses is a very positive agent. Where the hemorrhage is of a passive character, give carbo-veg.; oil of cinnamon on sugar, or equal parts of cinnamon and erigeron, are remedies which will be of certain benefit. *Mangifera indica* is another excellent agent in passive hemorrhage.

The diet should be carefully selected. Milk, in some form, should be taken liberally. One patient will do well on sweet milk, another on buttermilk, while a third will need koumiss. Eggs may be taken freely. Where fats can be taken and digested, they should form a part of the patient's diet. A change of air or a sea-voyage, where the patient is able to comply with such a prescription, is the best tonic.

SYPHILIS.

Synonyms.—Pox; Mal-Venerean; Lues Venerea.

Definition.—A specific infectious disease, weeks or months being occupied in its development; contracted by inoculation,—acquired syphilis, or hereditary,—congenital syphilis, and characterized by three distinct stages: *Primary; Secondary; Tertiary.*

Primary Stage.—This stage is characterized by the appearance of the initial sore or chancre at the seat of inoculation, in from twenty to thirty days after the introduction of the virus, and lasting on the average about six weeks.

Secondary Stage.—In this stage, constitutional symptoms occur in from sixty to ninety days after the primary lesion, in the form of fever, cutaneous eruptions, ulcerations of mucous surfaces—especially of the mouth, tongue, and throat, loss of hair, and frequently iritis.

Tertiary Stage.—This stage is characterized by inflammatory products, gummata, which develop from the third to the sixth year, and last from one to twenty years, or a lifetime, and which appear in the skin,

muscles, the various viscera, and in the bones.

History.—In all probability, syphilis is as old as the human race; for we can readily believe that illicit intercourse was practiced in the cities of the ancient world when the morals of the people were more lax than those of to-day. Our knowledge of this disease, however, dates from the fifteenth century. Breaking out among the troops of Charles VIII, King of France, it rapidly spread over Europe. From then to the present day our knowledge of the disease has grown, till today we are able to classify and separate the various lesions resulting from illicit and promiscuous intercourse. All forms of venereal disease were included under the name of syphilis till Ricord, in 1831, demonstrated to the profession that gonorrhoea and syphilis were two distinct lesions.

Etiology.—Predisposing causes are injuries or abrasions of the mucous surfaces of exposed parts, for the disease can originate in only one way, by inoculation.

The primary cause is now regarded, generally, as a bacillus, though the claim of Lustgarten and Van Neissen as discoverers of the syphilitic bacillus has not been verified. The contagion resides in the blood and morbid products of the individual suffering from syphilis. It reproduces itself for months and years, and, while it grows less malignant with age and finally loses its infecting principle, we have not yet been able to determine that fortunate period of time. In some it may remain for life.

The contagion can not be transmitted to the lower animals, man being the only animal subject to this loathsome and degrading disease. One attack generally renders one immune, though not always, and a mother who has borne a syphilitic child becomes immune, though there be no visible proofs of the disease, and she may handle or suckle a syphilitic baby with impunity.

Modes of Infection.—There are three modes of infection: 1, Illicit intercourse; 2, Heredity; 3, Accidental.

Illicit intercourse is responsible for the great proportion of cases, though the patient declares that it has occurred accidentally. The lustful gratification of the passions is perhaps responsible for seventy-five per cent of all cases of syphilis.

Accidental.—Kissing.—The reprehensible and general habit of kissing

is responsible, not only for diphtheria, scarlet fever, and a host of other contagious diseases, but also for this plague of the world, and lip chancre is not uncommon.

Nursing.—A syphilitic wet-nurse may convey to her charge the disease, or the babe may infect through the nipple her nurse. The physician who is called to treat all classes of patients may, through an abraded finger, receive the infection while administering to a patient in confinement.

A very rare, though possible cause, would be through shaving, or the use of the thermometer, though the stropping of the razor makes this very unlikely, and the wiping and dipping in cold water each time after taking the temperature would also seem proof against contagion by this means. Recently there has been quite an agitation for individual communion-cups in the religious rites of administering the Lord's Supper, to prevent this and other diseases. I am inclined to believe that such tales by patients are to hide their own' lust and indiscretion. Neither am I inclined to believe that vaccination has been such a prolific source of the disease, although I admit its possibility. Dr. Robert Cory, chief vaccinator to the National Vaccine Establishment, England, in his experiments, as recorded in Keating's Encyclopedia of Children, showed how little danger there is from vaccination.

Dr. Cory believed it impossible to convey syphilis by vaccination ; to prove which, he repeatedly vaccinated himself from children who were plainly and actively syphilitic. A number of these were barren of results, but finally, on July 6, 1881, he was not so fortunate in escaping. He vaccinated himself in three places from the lymph taken from a three-months old child that had eruptions and' sores which were evidently syphilitic. In three weeks syphilitic papules appeared at the seat of two of the punctures, and were followed in due time by sore throat, roseola, and other positive evidence of constitutional syphilis,—thus proving that, while it is possible to acquire syphilis by vaccination, it must occur very rarely in active practice.

Hereditary Transmission.—In hereditary transmission, nature plays some queer and unexplainable pranks. Two conditions are so well known that they have come to be recognized as established laws: Profeta's and Colle's,—the former, in which syphilitic parents beget a healthy child, the offspring acquiring immunity during gestation, which protects it from either parent; the other, Colle's law, is where a mother bears a syphilitic child, and she herself becomes immune, and can not

be infected, even though she presents no signs of the disease.

The most frequent form of transmission is from the father, the mother being free from infection. This is known as sperm infection. Here, again, we see strange results; for a decidedly syphilitic father may beget a healthy child, while, on the other hand, a man, who may have had syphilis in his early life, but apparently had recovered after treatment, not presenting a single phase of his old trouble for years, may transmit to his offspring the characteristic lesion of the disease.

The earlier the offspring is begotten, after the appearance of the primary sore, the greater the danger from infection, while, under judicious treatment, the danger is but slight after four years. The more remote from the initial lesion, the less the danger, and a parent suffering from tertiary lesion may beget a healthy child.

Infection from the mother, known as germ infection, is also quite common, the father being free. In most cases, however, both father and mother are infected, the latter by the former; in which case the child is very apt to show infection.

Where the mother becomes infected after conception, the offspring may show infection, when it is known as placental transmission.

Pathology.—*Chancre.*—The initial lesion consists of an infiltration of small round cells, together with larger epithelial cells, giant cells, and the bacilli of Lustgarten. The inflammatory process causes thickening, and sometimes obliteration, of the smaller arteries and veins, which give rise to sclerosis. This is soon followed by degeneration of the epithelium, causing the small, round, shallow ulcer about the size of a split pea, the hard, indurated convex surface forming its base. The near lymphatics are soon involved, becoming infiltrated and indurated, which in turn may caseate and break down.

Secondary Lesions.—The most common are ulceration of mucous surfaces and cutaneous eruptions. The favorite location for mucous patches is the mouth and anus. They vary in size from a pin-point to a half-dollar, their edges being slightly indurated. Iritis is quite a common attendant.

Tertiary Lesion.—Inflammatory products, known as gummata, characterize the third stage. These bodies are made up of round cells,

and vary in size from that of a millet-seed to that of a walnut. They are found upon the bones and periostium, and called nodes, or they may be found in the skin, muscles, liver, kidneys, lung, heart, brain; in fact, in any of the viscera of the body. Usually they are firm and indurated, though in the skin and viscera they may break down, forming ulcers.

A cross section of one of these products reveals a grayish white mass, firm in consistency, the center being caseous, while the outer border consists of translucent, fibrous tissue.

Acquired Syphilis.—*Primary Stage.*—The period of incubation, or the time from exposure to the appearance of the initial lesion, the chancre, is from three to five weeks, the average time being from twenty-eight to thirty days. The first evidence is a small red papule, which early reaches its full development, then undergoes central necrosis, giving rise to the ulcer. The outer edges become indurated and feel like cartilage; hence the name, “hard chancre.” The glands in the near neighborhood become enlarged and indurated, to be followed by general glandular infection; next in order are those of the axilla, to be followed by the cervical and occipital. If the chancre be located in the urethra and is small, it may escape detection. During this stage the general health is not impaired.

Secondary Stage.—This is usually announced by a light fever, from six to twelve weeks after the appearance of the initial lesion. Generally the fever is not very high, 103° or less, although occasionally it may reach 104° or 105°. The patient complains of headache, muscular pains, loss of appetite, impaired digestion, and less in weight. There is anemia, more or less pronounced, while the color becomes a dirty yellow, the well-known syphilitic cachexia.

Ulceration of the mouth and throat early appears in the form of white patches. On the tongue they may be ragged and irregular in appearance, with a firm base. There is usually but little pain from this source. About this time the rash, syphilitic roseola, appears upon the trunk, being profuse upon the chest, arms, and forehead. In color they are a dingy red or copper. It is not only a hyperemia, but also an infiltration, and when the finger is passed over them, there is a distinct sensation of their infiltrated character. This usually lasts from a few days to two weeks, though in exceptional cases it is present for months.

The papular syphilide may follow in order or appear simultaneously, or may appear without the roseolous rash having preceded it. The papules

are found in the scalp, face, and body, and vary in size from that of a pinhead to that of a pea. They are firm, hard, and painless. Following this we may have the squamous, the vesiculo-papular, pustular, and tubercular. These may follow in order or be developed independently of each other. There may be fissures or mucous patches about the anus, vulva, or vagina, that occasion a great deal of discomfort to the patient.

Alopecia is one of the frequent, and, to the patient, deplorable conditions of this stage. Not only loss of hair from scalp, but the hairs of the eyelids and brows may also drop out, giving the patient a ludicrous appearance, and one to be dreaded. Iritis is not an uncommon condition of this stage.

The secondary stage may disappear in two or three months, or it may occupy a year or more in its various evolutions.

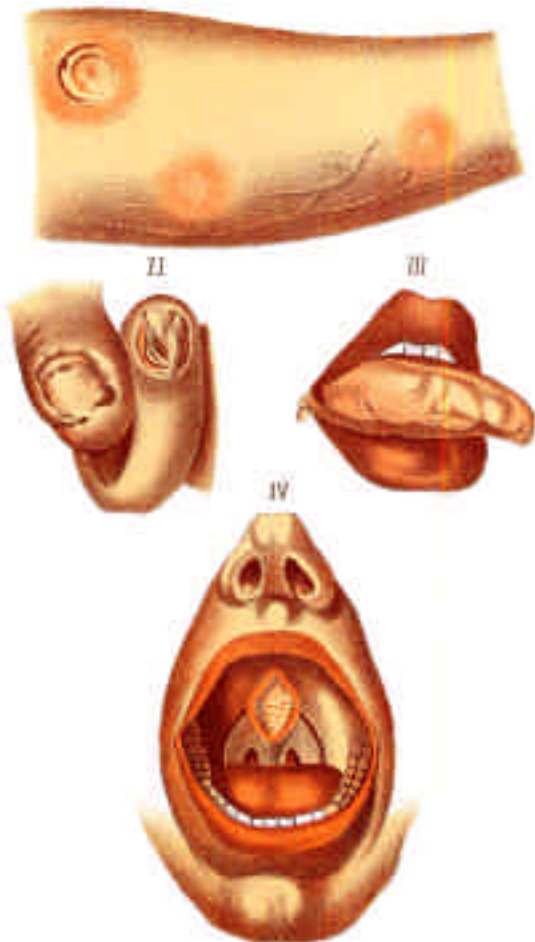


PLATE IX SYPHILIS.

I. Gumma of the foreskin. II. Orychia of thumb and forefinger, in the form of mucous patches affecting the matrix of the nails. III. Syphilitic ulceration of the tongue. IV. Syphilitic ulcer of the soft palate.

Tertiary Stage.—It is impossible to draw the dividing line between the various stages of syphilis. Usually some time elapses between the second and third stage, sometimes years intervening, during which time the patient will experience a season of health. At other times the tertiary lesions appear before the secondary have passed from view. These are the later syphilides, gummata, and amyloid degenerations.

The eruptions in this stage are more irregular and involve deeper tissues. Rupia, the most characteristic, is covered by dry crusts, beneath which are the ulcers involving the skin and deeper tissues. These are slow in healing,

and leave behind a cicatrix, a constant reminder of man's indiscretion.

Gummata may develop in the mucous membrane, skin, subcutaneous tissues, muscles, viscera, brain, cord, and bones. Where they develop superficially, ulceration and cicatrization occur. In the muscles they develop as tumors. In the viscera they undergo fibroid degeneration, attended by puckering and more or less deformity, thus impairing their function. They appear as nodes on the bones, the tibia and skull-bones being the favorable locations. These are painful to the touch, and with the approach of cold weather the patient desires to toast his shins, to relieve the chill and ache which attend these changes. The pains are worse at night.

Where the deposits are in the brain, they are usually located near the surface and are generally attached to the dura or pia mater. They vary in size from that of a pea to that of a walnut. A cut section reveals a mass, caseated and surrounded by a fibrous tissue. Where these masses come in contact with the meninges, meningitis almost invariably follows.

While gummata may appear in the cord, it is far more rare than in the brain. The arteries becoming occluded, arteritis follows. These lesions of the brain are usually slow in developing, years elapsing after the initial lesion. Persistent headache, resisting the ordinary treatment, should call attention to the nature of the trouble. Delirium may follow or precede the neuralgia. Dizziness is often encountered, and vomiting is a common attendant. Following a lesion of the cord, locomotor ataxia is the most serious result.

Gummata of the digestive tract throughout its entire course is not uncommon, though the deposits may be found in any portion. The orifices are the most frequently affected; in fact, they rival the skin in evidence of their presence.

The lips, mouth, and pharynx have already been mentioned as being the first to feel the force of the poison. Deposits in the esophagus, though not frequent, give rise to stricture. The selection of the stomach and intestinal tract for the deposit is quite rare, though the last inch of the bowel is a favorite site for the deposit. Like that of the esophagus, stricture is apt to result.

Liver.—The liver may be the seat of either diffuse or circumscribed deposits. The kidneys may also be involved. When the heart feels the

force of the poison, we' find warty excrescences, producing endocarditis. Deposits may also take place on the valves.

The respiratory tract is also invaded by this foe of the human race, the nose in rare cases showing the characteristic deposit. The larynx, as well as the trachea and bronchi, are occasionally involved. The lungs prove no exception to the general rule, the deposits usually selecting the middle and lower lobes rather than the apices, as in tuberculosis.

Testicles.—The gummatous deposits frequently select the testes as a fruitful soil for a display of their action, forming indurated masses in the body of the organ. The gland is swollen and enlarged, though but little painful. There is but little tendency to degeneration. The location of the deposit enables one to recognize it from tuberculosis, which seeks the epididymis as a nesting-place.

Congenital Syphilis.—The same conditions, expressed by similar symptoms, are to be found in congenital as well as in acquired syphilis, with the exception of the initial lesion, the chancre. The disease may show its characteristics while yet in utero, at birth, a few weeks later, or at puberty. The lesion will be considered in this order.

In Utero.—That the fetus feels the force of the virus while yet in utero, and shares in its destructive powder, is seen in frequent abortions and the presence at birth, or a few days later, of bullæ on the hands and feet, pemphigus neonatorum.

There are changes that take place in the viscera, and, though rare, are corroborated by such men as Gubler, Roehenbrome, Barensprung, and others. Hutchinson says: "Of these, a parenchymatous infiltration—fibroplastic—of the liver, for the most part without large gummata, is the most common. It is sometimes attended by anasarca, and similar lesions occur in the lung. If not actually present at birth, it may develop soon afterwards, and may then lead to jaundice and death.

Infiltrations of the same kind may be found also in the spleen, the kidneys, the thymus gland, and even in the heart. Occasionally larger and more circumscribed deposits are found, and sometimes softening occurs and abscesses form. These pathological processes occur chiefly during the later period of intra-uterine life, and are no doubt responsible for the majority of cases being born dead at, or near, full time. They may also occur during the first few weeks of life. At this age

jaundice is sometimes observed, and is a symptom of great danger.

As a rule, these early manifestations of the disease result in death, either at birth or at an early period, the number surviving being very small.

At Birth.—While the majority of syphilitic babies are born apparently healthy, being rosy and plump, the visible effects not appearing till the end of the fourth week, a certain number come into the world with the characteristic syphilitic cachexia. Their puny, feeble, emaciated bodies put so great a handicap upon them in the battle for existence, that few survive the struggle but a few weeks. The sallow or jaundiced skin is wrinkled and flabby, giving the child a prematurely old look.

Snuffles render the respiration difficult, the child breathing through the mouth, and frequently interfering with the child's nursing. Ulcers and fissures appear at the orifices of the body, especially at the mouth and anus. With the exception of pemphigus neonatorum, skin eruptions are rare. There is generally enlargement of the liver and spleen. Disease of the bones is often seen, with separation of their epiphyses.

Early Manifestations.—After four, six, or eight weeks of apparent robustness, the child develops a nasal catarrh, syphilitic rhinitis, which greatly interferes with nursing and respiration. This condition, known as snuffles, is attended by a mucopurulent or bloody secretion. This may be followed by ulceration and necrosis of the nasal bones, resulting in a depression at its base, which is characteristic of congenital syphilis. The catarrh may extend to the middle ear, giving rise to otitis media, followed by deafness and otorrhea.

The cutaneous symptoms early make their appearance, usually about the nates, either as an erythema, eczematous patches, or papules. They are of the characteristic coppery color. With these several symptoms the hair on the head and eyebrows may fall out, while the finger-tips become red and inflamed, and the nails finally separate and fall off. Ulcers or fissures about the mouth now make their appearance, the discharges from which are highly infectious, and, if nourished by a wet-nurse, transmit to her the disease. Other members of the family also may become infected by kissing and fondling the babe.

The spleen is usually enlarged, as may be the liver, though this is not characteristic. There is not so apt to be glandular enlargement in this as

in the acquired form. The child becomes restless, sleeps poorly, and has a sharp, shrill cry, due partly to pain, and partly to obstructed respiration.

Later Developments.—The child may seemingly recover from these early lesions, and for a time seem to have outgrown the effects of his early troubles; but during second dentition or puberty the old trouble again reappears. Development is arrested or retarded, and the child takes on a shriveled or withered appearance, and presents a stunted growth.

The brain is so unfavorably impressed by the infection, that proper development is retarded, and the patient retains childish peculiarities after reaching manhood. The testicles are atrophied or infantile. The forehead is prominent, the frontal eminences project, and the skull is asymmetrical. This outward appearance resembles that produced by a combination of tuberculosis and rickets, which results in slow development, emaciation, and a jaundiced appearance. Dentition is delayed, and is characteristic, the Hutchinson teeth being peg-shaped and notched, the dentin being revealed at the notch.

Keratitis develops first in one eye, then in its fellow. This begins as a hazy condition, and may result in permanent impaired vision, or, after a long period, may gradually clear up, with a complete restoration of sight. Iritis also frequently occurs.

Incurable deafness may now develop, together with otorrhea. These three conditions, *teeth, eye, and ear lesions*, have been termed the triad of Hutchinson.

General Diagnosis.—In making our diagnosis, we are to remember that direct questioning will give negative results, for if we ask the patient, “Have you had syphilis?” the almost universal reply will be an emphatic denial. Man's veracity, therefore, may safely be questioned when syphilis is the subject of interrogation. To obtain much information from the patient requires some tact on the part of the physician.

In place of the direct question, “Have you had syphilis?” carefully question as to pimples (papules), eruptions in general, falling of the hair, sore throat, mouth, or tongue. Examine throat, mouth, and tongue for old cicatrices, and the occipital region for enlarged glands; also the groins; inspect the shins for old scars or nodes. When eruptions are

present, inquire as to pruritis, if any, bearing in mind that syphilitic eruptions rarely itch. We are not to forget, however, that associated with the characteristic eruptions there may be eczema, with its accompanying pruritis.

In women, repeated abortions may throw some light on the case. In congenital syphilis, the characteristic snuffles the first few weeks, and the eruption, together with fissures and ulcers of the mouth or lips, will be conclusive evidence. When the symptoms are delayed till second dentition or puberty, the general cachexia, and the childish appearance and actions, which do not correspond with the age of the patient, the imperfect development of the subject, the Hutchinson teeth (peg), keratitis, and otitis are symptoms that can not be overlooked.

Prognosis.—The prognosis is more favorable than in former years, and, with judicious treatment, the ravages of former times are not seen. The congenital form does not yield so readily to treatment. The vitality seems to have suffered so severely that the frail body is unable to resist the inroads of the virus, and the weakling succumbs to the inevitable in a large per cent of the cases.

Treatment.—My experience in venereal diseases has been quite limited, and I will give the remedies as used by our school. About the only mercurial remedy we give is the small amount found in Donovan's solution. Other than this we believe patients do far better without the mercurials, and are satisfied that much harm has been done in their administration.

Berberis aquifolium is an agent of undoubted value in this trouble, Dr. Webster regarding it as a specific. Under the judicious administration of this remedy, the patient's appetite is improved, the loss of flesh and strength is arrested, and the visible evidences of the disease disappear. If you do not impress your patient with the necessity of taking the remedy for a year or more, however, you lose the early effects by its reappearing.

Syphilis is a disease which needs medication constantly for a year and a half to two years, if we wish to avoid the tertiary manifestations. *Thuja* was used quite extensively by Dr. Goss, both internally and locally. *Corydalis formosa* is also a great remedy with Eclectics; to prevent the severe lesions of the tertiary state there are few agents of equal value. It may be given singly or combined with *berberis aquifolium*. The old

compound syrup of stillingia and iodide of potassium was a favorite with the fathers in the tertiary stage, and it would be difficult to persuade some of our older members that the iodide of potassium in ten-grain doses, minus the stillingia, would be nearly so efficacious.

Echinacea, in half teaspoonful doses, gradually increasing the dose to a teaspoonful, is also an excellent remedy. The iodide of potassium may be given in combination with stillingia, corydalis, or berberis aquifolium. The remedy is to be used in the tertiary stage. As to the local treatment, I am not in favor of escharotics. You may destroy, by an escharotic, a chancre, but remember that the poison is doing its work in the system at large, and nature is using the local manifestation as a waste-gate. Dress it with boracic acid and hydrastis, or touch it with a saturated solution of thuja. Where the ulcers or chancres are beneath a contracted foreskin, make a free incision, allowing the foreskin to roll back and bring into view the local trouble; after this a free use of warm boracic acid solution will be beneficial. The parts may be dusted with boracic acid and hydrastin. The parts must be kept clean and free from pent-up secretions.

DENGUE.

Synonyms.—Break-bone Fever; Dandy Fever; Broken-wing Fever.

The fanciful and grotesque names which have been used in naming the disease prove its variable character.

From the intense character of the pain, it received the most common and suitable term, break-bone fever; while the peculiar gait of the patient, owing to stiffness of the joints, gave him a grotesque appearance; hence he appeared like a “dandy,” dengue being a Spanish corruption, no doubt, of dandy.

Definition.—An acute, specific, infectious fever, occurring epidemically in tropical and subtropical climates, and characterized by two severe paroxysms of fever, separated by an intermission, great muscular and arthritic pains, and attended usually by an eruption.

History.—Brylon was the first to recognize and describe the disease, which occurred as an epidemic in Java in 1779, and which he termed articular fever. In 1780 it appeared in Philadelphia, and was accurately

described by Benjamin Rush. From 1824 to 1828 it prevailed at intervals in India, the West Indies, and Spain. It has occurred at intervals in our Southern States and along the Gulf Coast, the last visitation being in 1897. While usually confined to the South, it has occurred as far north as Philadelphia, New York, and Boston.

Etiology.—The nature of the infection or contagion is not yet known, though McLaughlin, of Texas, has isolated and cultivated a micrococcus which he believes is responsible for the disease, That it is infectious is shown by the rapidity with which it spreads when once it invades a section.

Thus, in 1885, within a few weeks, sixteen thousand out of a population of twenty-two thousand, in Austin, Texas, were stricken. Neither age, sex, race, nor position exert any influence in staying the disease, all classes suffering alike.

Pathology.—As few cases prove fatal, but little opportunity has ever been given to study its pathological character. There has been found infiltration of the tissues about the joints, somewhat resembling rheumatism, but not enough is known to speak definitely of the morbid anatomy of the disease.

Symptoms.—After an incubating period of from three to four days, in which there are few, if any, prodromal symptoms, the disease is ushered in with a chill in the adult, and quite frequently by convulsions in children. There is a rapid rise in the temperature, the fever registering 104°, 105°, or 106° at the end of the first twenty-four or forty-eight hours. The pulse and respiration are quickened in proportion to the elevation of the temperature; the face is flushed, eyes injected, tongue coated, and there is nausea and sometimes vomiting. The pain in head, back, and limbs is of an intense character; the patient's complaint is as though his back and limbs would break; hence the term break-bone fever.

The joints are red, slightly swollen, and stiff; there is also general muscular soreness. Although the temperature is extremely high, there is rarely delirium or unconsciousness to relieve the excruciating pain. The lymphatics become painful and swollen. There may be diarrhea, though the bowels are usually quiet; the urine is scanty, though non-albuminous.

The primary fever lasts from three to five days, during which time a rash, varying in character, appears, though not in all cases. It may be scarlatinal, rubeolar, herpetic, papular, etc., and is usually followed by desquamation. This primary fever is followed by an intermission of two or three days, attended by great relief, though there is soreness and stiffness of the joints, the patient exhibiting the peculiar gait already mentioned. In some cases the temperature becomes subnormal, while in others there is only a remission.

In from two to five days a secondary fever occurs, whereupon all the symptoms of the primary fever are reenacted, though usually in a less aggravated form. This secondary fever is of shorter duration, lasting only two or three days. It is also attended by the same rash as the primary.

Although the duration of the fever is only from seven to ten days, convalescence is apt to be slow and quite protracted. The prostration that follows a severe attack is very marked, the patient being unable to do severe mental or physical work for weeks.

Diagnosis.—When prevailing as an epidemic, and especially when it is of a severe type, there is but little difficulty in establishing a diagnosis. The sudden onset, high temperature, excruciating pain in muscles and joints, and the appearance of the eruption, leave but little doubt. In sporadic cases it may be mistaken for inflammatory rheumatism, but a careful study will soon show the distinguishing features of each.

Another disease likely to be confused with dengue is la grippe. The onset, the marked myalgia, are similar in each, but there the similarity ends.

Prognosis.—It is rare for a case to end fatally, only those of advanced age or persons of feeble vitality succumbing to its influence.

Treatment.—The disease being self-limited, the object of our treatment will be to reduce the febrile state, allay the intense pain, and render the patient as comfortable as possible. Rest in bed should be emphasized, and the diet should be fluid in character; milk and rich broths being best suited to sustain the patient's strength.

For the high fever, use the wet-sheet pack, assisted by veratrum, if the pulse be full and strong, and combined with gelsemium where there is

great nervous irritation.

For the myalgia, macrotys, rhamnus Californica, and bryonia will be used, and for the lymphatic involvement phytolacca will be the remedy.

Jaborandi may be useful during the active stage of the fever.

Of course, quinia will be used if the patient resides in a malarial section and if periodicity exists.

THE PLAGUE.

Synonyms.—Bubonic Plague; Pestilence, or Pest; Black Death; Plague of Egypt.

Definition.—A specific, infectious, and contagious disease of peculiar intensity, rapidly running its course, and characterized by inflammation of the glands (buboes), carbuncles, ecchymoses, and petechise upon the surface. It is endemic on the eastern coast of the Mediterranean Sea and the Oriental countries adjacent. Epidemics occur when it spreads to other parts of the world, traveling along the great thoroughfares of travel and commerce.

History.—The plague is a very old disease, and probably epidemics raged and devastated peoples centuries before we had any authentic accounts. Sacred and profane histories speak of pestilences which ravaged the Valley of the Nile and the Plain of Philistia. Greece was severely visited, and Athens lost nearly a third of her population four hundred years B. C. Many believe that these “visitations” were none other than the plague.

The earliest positive knowledge that we have of the disease dates from the epidemic which occurred in the sixth century, beginning in Egypt in 542, and extending to Palestine, Syria, and Persia; passing thence into Asia Minor, then on into Europe, carrying off, at Constantinople, ten thousand victims in one day (543 A. D.). Becoming pandemic, it spread in every direction. It is estimated that fifty per cent of the inhabitants of the Eastern Hemisphere died, either directly or indirectly, from this great epidemic before the close of the sixth century.

The next great epidemic was the irresistible march of the “Black Death”

during the fourteenth century. Beginning in the East, it spread throughout Armenia, Asia Minor, Egypt, Northern Africa, and nearly all of Europe. It is estimated “that one-fourth of the population, or twenty-five millions, perished as a result of this epidemic or pandemic in Europe.” (Hecker.)

The seventeenth century witnessed its ravages in London, 1664, where, seventy thousand, or one-third of the population, succumbed to the dread plague. Many epidemics have occurred since then, attended with the usual mortality, but there has been no great pandemic since 1664, unless the epidemics during the early parts of the eighteenth century be included. Interest in this disease has been renewed since the outbreak at Hong-Kong in 1894, when twenty-five hundred deaths resulted. In 1896 it broke out in the Bombay district, where, according to Wyman, there were two hundred and twenty thousand, nine hundred and seven cases, with a mortality of over one hundred and sixty thousand.

In 1899, China was invaded, and also Europe. In October, 1899, the plague appeared in Brazil, according to Wyman, the first instance of its appearance in the Western Hemisphere. In 1899, two cases appeared on board the British steamship, J. W. Taylor, at quarantine off New York; but owing to prompt and vigorous action of the officials, the disease was not permitted to spread. During 1901 a few cases appeared in the Chinese quarters at San Francisco, but prompt measures on the part of the Sanitary Department prevented its further progress.

This disease has aroused an interest never before felt in America since our new possessions, Hawaii and the Philippines, have been so severely visited. In 1899 and 1900 the disease broke out in Honolulu and Manila, but, thanks to the vigorous action on the part of the military authorities, the disease was not allowed to assume alarming proportions.

Etiology.—Predisposing causes are poverty and filth. The more wretched classes are compelled to live in closely crowded quarters, where but little, if any, attention is given to sanitary measures. As a result, the inhabitants, weakened by their environments and vices, early succumb to the infection, which rapidly multiplies in so favorable quarters.

Soil and season also influence its spread; for low, marshy tracts and hot weather favor its propagation, though it has occurred in mountain heights, and in cold weather.

Exciting Cause.—To Kitasato belongs the honor of discovering the specific cause, the bacillus pestis bubonicæ. This is a short bacterium, almost as broad as long. On entering the body, either by inoculation or by way of the digestive or respiratory tracts, it multiplies with great rapidity. It is found in the blood, in the internal organs, in the intestinal canal, lymphatic glands, and in great numbers in suppurating buboes.

Outside the body it is found in dust and infected clothing and bedding of infected houses; it is also found in fleas, flies, rats, mice, cats, dogs, and other domestic animals. It is now believed that rats are the common carriers of this dread plague.

Pathology.—Rigor mortis occurs early, and often there is elevation of temperature immediately after death. Petechiæ, ecchymoses, and carbuncles are generally found upon the skin. The lymphatic system is early affected, the lymph glands of the groin and axilla being the first to show evidence of the inflammation.

Broncho-pneumonia is a common result, the lung tissues being involved more than in ordinary broncho-pneumonia. The spleen is soft and swollen, with hemorrhagic areas. The liver and kidneys also show degenerative changes.

Symptoms.—Three varieties are recognized: (1) The bubonic; (2) The pneumonic; (3) The septicemic. The first named is the most frequent and typical.

Four stages are given: (1) Invasion or prodromes; (2) Fever; (3) Localization, or development of the buboes; (4) Convalescence.

Incubation.—This period lasts from twelve hours to seven or eight days.

Invasion.—This stage begins suddenly, with dizziness, pain in the head and back, and with more or less depression; the patient is dull, eyes expressionless, and the mind is confused. When the patient attempts to walk, he staggers like a drunken man. There may be no distinct rigor, but chilliness occurs, with nausea and vomiting. Often diarrhea appears early. These symptoms last twelve, twenty-four, or thirty-six hours, when the second stage is ushered in.

Fever.—This stage frequently commences with a chill, followed by a quick rise of temperature. The pain in the head and back increases; the

pulse-beat is from 120 to 140 per minute; the skin becomes hot, dry, and constricted; the temperature rises to 103°, 104°, or even 107°. The tongue is heavily coated, and sordes early show on the teeth and lips in the form of dark, bloody crusts. The vomiting may continue through this stage. The patient may become very restless, with active delirium, or the delirium may be passive, early passing into stupor. The pulse now becomes small and feeble, the face assumes a bluish hue, with coldness of the extremities, and collapse is threatened; enlargement of the glands now begins, and the third stage is present.

Development of Buboes.—The lymphatics in the groin first appear, followed, in severe cases, by those of the axilla and other parts of the body; these develop from the third to the fifth day. If suppuration occurs, it is looked upon as a favorable symptom.

Carbuncles often occur in connection with the buboes, a favorite location being the legs, buttocks, and back of the neck. Petechiae also may appear, which is always regarded as a grave symptom. These are known as plague spots,—responsible no doubt for the term “Black Death,” the body becoming livid or black after death.

Convalescence, or Fourth Stage.—This stage begins from the sixth to the tenth day, and may be rapid, or prolonged for days, by the suppuration of the buboes.

Pneumonic Form.—In this variety the infectious agent enters by way of the lungs, while in other cases it is usually by bites or abrasions of the surface. In this form the lungs receive the full force of the poison, which is shown by the cough, bloody expectoration, pain in chest, and all the phenomena of pneumonia. These cases number the greatest fatality, and often death intervenes before the development of the buboes.

Septicemic Form.—This is regarded by Sternberg and others as rather a secondary phenomenon, occurring in fatal cases, and not a distinct form of disease.

Diagnosis.—The diagnosis would not be difficult during an epidemic; the sudden invasion, high fever, and the development of buboes are symptoms so characteristic as to leave but little room for doubt.

Prognosis.—This is the most fatal of all the infectious diseases, ranging from eighty to a hundred per cent.

Treatment.—The treatment heretofore has been very unsatisfactory, and serum therapy at present is occupying the mind of those who have to deal with the disease. If any remedy would influence the disease, we are inclined to think that it would be phytolacca and echinacea in large doses. This, however, is speculation, for we know personally nothing about it. Means to hasten the suppurative process should always be used.

Prophylaxis.—Since it is a filth disease, the attention in the future will be turned to its prevention. Vigorous action on the part of Sanitary Boards will so overcome the conditions which favor the development of the disease, that, in time, plague will become a disease of history.

LEPROSY.

Synonyms.—Lepra; Elephantiasis Græcorum; Leontiasis.

Definition.—A chronic infectious disease, caused by the bacillus lepræ, and characterized by cutaneous pigment alterations, tuberculous growths in the skin and mucous membranes, and by degenerative changes in the nerves, with implication of the lymphatic ganglia and internal viscera, and the ultimate production of a cachexia, which usually terminates fatally.

History.—Leprosy existed in Egypt 3500 B. C., and the clear-cut and well-defined description of the disease and the methods of dealing with it, as found in the thirteenth and fourteenth chapters of Leviticus, show that the writer was as familiar with it as the authors of modern times. Lucretius says, “Leprosy is a disease born in Egypt along the waters of the Nile, and nowhere else.” The Hebrews brought it with them from the land of bondage, and to be a leper was worse than death.

India, Arabia, Palestine, and China have also been its home from the earliest times. During the decline of the Roman Empire, when Europe was overrun with immigration, leprosy increased to an alarming extent. Rev. L. W. Mulhane, in a little work on “Leprosy and the Charity of the Church,” says: “In the thirteenth and fourteenth centuries, the awful disease had made such headway that leper institutions might be said to cover the face of Europe, and at one time there was scarcely a town in France but had its leper asylum, and in the kingdom of France alone

there were two thousand leproseries—hospitals for lepers.

“In England one hundred and ten leper-houses existed from the twelfth to the sixteenth century.”

The twentieth century finds the disease entrenched in Norway, Egypt, Syria, India, China, Japan, the West Indies, South America, the Philippines, and the Sandwich Islands. Not a single country in Europe is free from it, and in the United States there are more than five hundred cases.

The importation of leprosy into the United States may be traced to several distinct sources. Dr. Prince Morrow in “The Twentieth Century Practice,” says:

“1. It was introduced into the Atlantic Coast cities and the countries along the Atlantic seaboard from the West Indies, and probably Africa, through the importation of slaves, and intercourse through travel and trade with the neighboring West India Islands.

“2. By leprous immigrants from Norway and Sweden into the Scandinavian colonies of Minnesota, Wisconsin, Iowa, and Dakota.

“3. By the Acadian refugees from the British Provinces of New Brunswick into Louisiana.

“4. By lepers from Mexico into Texas and States bordering the Gulf of Mexico and the Rio Grande.

“5. By Chinese immigrants into San Francisco and elsewhere on the Pacific Coast.

“6. By Hawaiian lepers into California, Utah, and other parts of the country.”

Etiology.—While all ages, conditions, and sexes are susceptible to the disease, the period between twenty and thirty years of age is the most liable to attack, and must be given as among the predisposing causes. It is somewhat more common in men than in women, and while all classes of society are susceptible, squalor and overcrowding, which give greater exposure to contagion, favor the disease. Heredity has also undoubtedly some influence.

The specific cause, the bacillus lepræ, discovered by Hansen in 1874, resembles the tubercle bacillus, though it may be distinguished from it by “differential stains,” by their great number, and by their tendency to form colonies, and to the fact that as yet it has failed to propagate in inoculation tests.

Pathology.—The tubercles of leprosy are made up of granulomatous tissue, and consist principally of round cells, in and between which are found the bacilli in large numbers. These tubercular masses involve the skin, and, pushing outward, form nodular masses, between which are seen areas of ulceration and cicatrization, which, in the face, distort the features, and give rise to the so-called *facies leonina*.

These tubercular masses caseate, soften, and discharge a thick purulent material, or partial organization may take place, staying the further progress of the disease.

The destruction of tissue proceeds gradually, years being occupied in destroying the patient. The deep, ulcerative process may amputate fingers and toes in its progressive march—*lepra mutilans*. When the bacilli develop in the nerve fibers and their sheaths, a peripheral neuritis results, with local anesthesia.

Symptoms.—This is a chronic disease, lasting from five to twenty years before death finally ends what has been, for years, a living death. Indefinite prodromal symptoms, such as malaise, general depression, loss of appetite, gastro-intestinal disturbance, may appear months before the outbreak. Two distinct forms are seen: 1. The nodular, or tubercular; 2. The anesthetic.

Tubercular Form.—This is the most common form, embracing from sixty to seventy per cent of all cases. The first suspicious or positive evidence is the appearance of irregular spots or patches of erythema, more or less clearly defined and slightly hyperesthetic. These always appear on the face, though other portions of the body may be involved. After a time, these may partially or wholly disappear for a season, but always reappear, generally as circumscribed infiltrated spots. Gradually these develop into leprous nodules. The nose and lips become thickened and stiff.

These same tubercular masses appear in the nose, mouth, and throat;

the voice becomes hoarse, and may finally disappear. The hair on the face, such as the eyelashes and eyebrows, drop out, the patient presenting a horrible appearance. Sometimes these infiltrated patches fail to develop into tubercular nodules, but gradually change to smooth, white patches—lepra alba.

The tubercular nodules, after developing gradually for years, undergo retrogressive changes, the tumors gradually melting away, leaving in their place dark, pigmented patches. In this way, bone and cartilage may be destroyed without ulceration.

Generally, however, indolent ulcers develop, which result in great destruction of tissue; the nose, fingers, toes, and sometimes an entire limb, are amputated by this method. Tubercles may develop on the cornea and iris, destroying the sight, and the patient, blind and with face horribly distorted, with nose, fingers, and toes rotting off, presents a condition unequalled in any other disease.

Anesthetic Form.—So different in character is this form of leprosy, that it is difficult to realize that it arises from the same specific cause.

The first evidence of the disease is the appearance, usually, of a local erythema, though in rare cases its first appearance is in the form of bullæ; so constant are the macules in this variety that Hansen proposed the term “macular leprosy” for that of anesthetic leprosy.

This variety is characterized by nerve lesions and trophic changes in the skin. With the appearance of the macules, which may be of a coppery hue or a pale yellow, there is a stinging, burning, or painful sensation. These appear on the shoulders, back, buttocks, knees, face, and arms, and vary in size from a dime to quite a large patch.

At first painful, it soon loses its sensibility, which is characteristic of this form. The nerve trunks affected, if superficial, can be readily felt as hard, nodular substances. Bullæ occasionally appear, leaving anesthetic patches behind; with these changes, go atrophy and contraction of the muscles.

The hands become clawed, there is wrist-drop, the face is deformed, the eyelids and mouth can not be closed, and the tears and saliva flow away; the nails split, change color, and fall off; the hair loses its gloss, and falls out; the strength gradually fails, and, after many long years,

death, the leper's friend, comes to his relief.

Diagnosis.—In the early stages, the erythematous macule, with hyperesthesia, followed by anesthetic areas, is quite characteristic. In the advanced stage there would be little difficulty in recognizing either form. When there is doubt, a microscopic examination will reveal the bacillus lepra, if the disease be present, for it is known to be found in no other disease.

Prognosis.—The disease, though terminating fatally, may run for several years without very much suffering or discomfort. The profession has, as yet, looked in vain for a specific for this dread disease; hence the prognosis is almost certain death.

Treatment.—The experience of thirty-five centuries of treatment is not flattering to the profession. Of the large number of agents used, none have stood the test, and the physician of the twentieth century stands as helpless in its presence as the Egyptian healer, who practiced his art fifteen hundred years before Christ.

The medical world is anxiously awaiting the verdict of the latest remedies said to be curative; namely, chaulmoogra oil, expressed from the seeds of the *Gynocardia odorata*. Dr. Le Page, of Calcutta, was the first to use the remedy, which is given in doses of from five to eighty drops three times a day, either in capsules or in emulsion. The patients do better on the large dose; but, unfortunately, the agent is irritant to many stomachs, and even the minimum dose can not be retained. It is also used externally in the proportion of one part to five or ten parts of olive or cocoanut oil, or as an ointment of gynocardic acid.

Gurjun oil, derived from the *Dipterocarpus turbinatus*, is also another agent of which great things are expected. This is given in emulsion, equal parts of the oil and lime-water, the dose of which is from one to four drams; externally, one part to three of olive oil or lime-water.

Since the disease, when once contracted, is incurable, the greatest interest is attached to the problem of how to avoid getting the disease. This is of special interest to Americans in view of the recent acquisition of Hawaii, Puerto Rico, and the Philippines, each of which is the habitat of leprosy.

Isolation or segregation of lepers is perhaps the first and most important

of all prophylactic means, and an "International Congress," such as met in Berlin in October, 1897, should receive the hearty co-operation of all medical men. The adoption of uniform laws among all the nations of the world, as to the establishment of lazarettos and the compulsory isolation of lepers, would go far to banishing the disease. To this should be added the improvement in the social and hygienic condition of the people.

GLANDERS.

Synonym.—Farcy.

Definition.—A specific infectious disease of the horse, communicable to man by inoculation, and characterized by the formation of nodules in the mucous membrane of the nose—glanders; and also beneath the skin and lymph structures—farcy.

Etiology.—In 1882, Loemer and Schiitz discovered the bacillus mallei, a non-motile bacillus, resembling the bacillus tuberculosis, though shorter and thicker, which, when injected into horses, reproduced the disease in its every characteristic.

The infectious material is transmitted directly from horse to man, usually through an abraded surface, and occurs most frequently among hostlers, veterinarians, farmers, and those who come in contact with horses. It has been communicated from man to man, but this is rare.

Pathology.—The granulomatous nodules are made up of lymphoid and epithelioid cells in which are found the characteristic bacilli, and are located in the nose—glanders; or beneath the skin—farcy. These nodular masses soon discharge a yellow pus, which infects any abraded surface. In the nose, ulceration follows the suppurative process, while abscesses are found when the affection is of the skin.

Symptoms.—The disease may be divided into the acute and chronic forms, whether of the nose or that found in the sub-mucous tissues. The period of incubation is from three to five days.

Acute Glanders.—The first evidence of the disease is usually a redness and swelling at the seat of inoculation, and the neighboring lymphatics become swollen and painful. Chilly sensations, headache, nausea, and fever precede or rapidly follow the local symptoms. Within forty-eight

hours, small nodules develop, which in a few days suppurate and discharge an offensive, purulent material. The inflammation extends to the adjacent respiratory apparatus, the pharynx, larynx, and bronchi often being involved; the cervical lymphatics are also implicated.

A papular eruption appears on the face and trunk and quite freely about the joints; these rapidly develop into pustules, which so closely resembles small-pox that the disease has been taken for variola. The constitutional symptoms are very pronounced, the tongue showing evidence of sepsis, and typhoid symptoms are present. After eight or ten days, the patient succumbs to the force of the disease, and death results.

Chronic Glanders.—This is a rare form, and is characterized by less intense and more vague symptoms and a more protracted course. There are ulcers in the nose, with a fetid discharge, and more or less respiratory complications. Muscular and arthritic pains are common; fever, attended by progressive prostration and general atrophy, follows, and after weeks or months of suffering the patient dies, though an occasional case recovers.

Acute Farcy.—In this form the force of the infection makes itself felt in the skin and subcutaneous tissues, while the nose remains free. The nodular enlargements are found about the joints and in the course of the lymphatics. When very large, resembling tumors, they are known as “farcy buds;” these suppurate, discharging a fetid, purulent material. There is gradual prostration, irregular fever, exhausting sweats, and colliquative diarrhea, the patient dying in from ten to fifteen days.

Chronic Farcy.—The chief feature in chronic farcy, is the formation of granulomatous tumors which degenerate into abscesses; they are chiefly found about the joints and on the lower extremities. They discharge a thick, yellow pus in the early stage, but this gradually changes to a fetid ichorous fluid; in some cases the ulceration is quite destructive, extending to the bone. This may last for months or years, the system being gradually poisoned, till at last the patient dies of pyemia or septicemia.

Diagnosis.—The history of exposure or contact with an infected animal is very important, though the severity of the nasal affection, the cutaneous eruption, the ulcers, and abscesses would hardly be mistaken for other troubles. When doubt exists, pure culture should be made and injected into a rabbit or guinea-pig; if the disease exists, the animal

usually dies within twenty-four hours.

Prognosis.—In the acute forms of glanders and farcy the prognosis is unfavorable, death being almost the universal termination. In the chronic forms, some cases recover, though a large per cent end fatally.

Treatment.—Excision or cauterization of the primary lesion is recommended; though this may modify the local lesion, we are not to forget the systemic poisoning that has already occurred, and, if we hope to be successful, we must use internal antiseptics. Echinacea in full doses should be used per mouth, and after thoroughly incising and draining the abscesses, wash them with the same agent. The sulphites, chlorates, and mineral acids, as indicated, should be tried. Although the outlook is decidedly unfavorable, these agents should be thoroughly used.

ACTINOMYCOSIS.

Synonyms.—Big Jaw; Lumpy Jaw.

Definition.—A specific infectious disease of domestic animals, particularly' cattle, communicable to man, and caused by the ray-fungus, the streptothrix actinomyces.

Etiology.—Dr. Bollinger was the first to observe the ray-fungus as a cause of big-jaw, in 1877. The following year, Israel found the same in man, while Ponfick, in 1879, proved their identity. The actinomyces is a fungus, consisting of delicate filaments or threads radiating from a common center; hence the term ray-fungus. These threads present a fine, delicate network, part of which shows a tendency to branch; the ends of the filaments are bulbous or club-shaped.

Infection takes place, as a rule, through the mouth, though rarely, through the respiratory apparatus, and through a cut or abraded surface. The cereals, barley and rye, are supposed to contain the fungus, and may be a source of infection to cattle. As yet there is no evidence that man contracts the disease from the ingestion of diseased milk or meat.

Pathology.—The fungus produces a granulomatous tumor, similar to that produced by the bacillus tuberculosis, and consists of a mass of

proliferated connective tissue-cells, among which are seen epithelioid and giant cells. As the growth increases in size, there is a rapid proliferation of the neighboring connective tissue, and the mass takes on the appearance of a sarcoma, and when located in the jaw may be mistaken for osteosarcoma.

While the disease is known by the name of big-jaw, we are to remember it is not limited to any organ; thus we have actinomycosis of the lungs, digestive tract, and skin. Ponfick says: "There are very few portions of the human body which may not be the seat of the actinomycotic process, and almost no organ which may not furnish lodgment for its primary focus."

Symptoms.—Actinomycosis is a chronic disease, and makes its appearance so slowly and insidiously that its early symptoms are overlooked. Again, the fact that it may attack any portion of the body gives rise to a multiplicity of symptoms; it will be well, therefore, to speak of the more prominent forms separately.

First, of the Face.—The first suspicious symptom may be pain in the jaw, or the teeth may seem affected. Again, the patient experiences pain in swallowing, and there is slight stiffness of the jaws. Following these rather vague symptoms, nodular elevations appear on the jaw or the neighboring tissues; these develop slowly, and generally without pain. Finally, after months of progressive changes, involving both hard and soft structures, the tumor mass suppurates, discharging a yellowish pus, in which is found the fungus. When the respiratory apparatus is involved, there is cough, with the development of the pulmonary abscess, and the expectoration of a fetid, disgusting mass. Progressive emaciation takes place, night-sweats occur, and the disease may be taken for phthisis or putrid bronchitis.

Where the disease invades the digestive tract, there is gastro-intestinal disturbance, and when the submucous nodules, which have developed in the mucous membrane of the bowels, suppurate, the ulceration may cause perforation or peritonitis.

Where the disease involves the skin, cutaneous actinomyces, chronic suppurating ulcers discharge a non-offensive pus, yellow in color, greasy to the touch, and containing fine granules, which may be seen by the unaided eye, and which contain the fungus.

Diagnosis.—The positive diagnosis is the presence of the actinomyces in the discharged pus. The hardness of the swollen jaw and neighboring tissues, the long course of the disease, the yellow pus with visible granules, and the characteristic pyemic symptoms, all point to the disease; but the one absolute proof is revealed only by the microscope, the presence of the ray-fungus.

Prognosis.—The prognosis depends largely upon its location. When it appears externally, as upon a bone or upon the skin, and surgical aid is invoked while the disease is yet local, the prognosis will be favorable, but where internal organs, the brain, lungs, liver, intestines, etc., are involved, the prognosis is decidedly unfavorable. The disease usually terminates fatally.

Treatment.—The treatment is principally surgical, the offending parts being removed wherever it is possible. The internal treatment should be antiseptic, supportive, and constructive. Agents which improve nutrition and secretion, which improve the quality of the blood, and at the same time stimulate the excretions, will be found to give the best results.

ANTHRAX.

Synonyms.—Malignant Pustule; Splenic Fever; Wool-sorter's Disease; Carbuncle; Bloody Murrain.

Definition.—An acute infectious disease, caused by the bacillus anthracis, and characterized by the formation of a boil with a circumscribed, infiltrated base and dark center, and a systemic infection of a severe type, the toxemia being of the gravest character.

Etiology.—The bacillus anthracis, the recognized specific cause of anthrax, is the oldest known and most widely studied of all the microorganisms. It was the first bacillus ever credited as being the cause of an infectious disease, and was first recognized by Pollender in 1855. It is an elongated, motionless, rod-shaped bacillus, from two to ten times the length of a red-blood corpuscle; the rods are often united, giving them the appearance of “bamboo-cane.”

They multiply by fission, reproducing themselves with great rapidity. They can be grown easily on various culture media. The spores possess remarkable vitality, freezing having no effect upon them, and they

survive for some minutes at a temperature of 212°, the boiling point. While the bacilli are destroyed in ten seconds in a one-per-cent solution of carbolic acid, the spores will live for thirty-seven days in a five-per-cent solution of the same, and while desiccation destroys the bacilli in a few days, the spores remain active for years.

They infect cattle and sheep principally, and man occasionally, and are introduced into the system through a wound, or by the bite and sting of insects, through digestion, and also by inhalation.

Occupation is a predisposing cause, and workers who come in direct contact with infected animals or their products are most liable to the disease; as butchers, tanners, herders, hostlers, and those who handle hair and hides. It prevails in Europe, Asia, and South America, but only to a slight extent in this country.

Pathology.—The usual lesions that are found in severe infectious diseases—viz., degeneration of the liver, spleen, and kidneys—are found in anthrax. In addition to the local lesions, ulceration, and edematous infiltration, the most marked and most constant lesion is splenic enlargement, it sometimes being three or four times its natural size. The blood is dark, thick, diffuent, and rich in spores.

Symptoms.—Two principal forms occur, external and internal.

External.—Malignant Pustule.—After an incubating period of from one to four days, the patient experiences a smarting, pricking, burning, or stinging sensation at the seat of inoculation, usually the hands, face, or neck, and soon a papule appears, which rapidly changes to a vesicle, the contents of which are bloody. On rupturing, a brown or black scab forms—anthrax.

Encircling the primary pustule, are seen a number of smaller pustules giving it the appearance of a carbuncle. The base of the primary ulcer becomes infiltrated and swollen, often involving quite an extensive area. The neighboring lymphatics soon become involved, and lymphangitis is quite common.

For the first twenty-four or forty-eight hours, the disease is of a local character, but soon systemic symptoms appear, the temperature rising rapidly; there is nausea, vomiting, diarrhea, profuse sweating, and finally collapse, which may terminate fatally in from five to ten days. In

more favorable cases, the temperature begins to decline by the fifth or sixth day; the scab sloughs off, the ulcer healing by granulation.

Anthrax Edema.—In this form there is an absence of the local pustule or eschar. The infectious poison invades the deeper tissues, and is followed by swelling and edema, which in some cases is extreme. The usual seat of the edema are the eyelids, lips, tongue, and upper extremities.

Internal Anthrax.—Intestinal Mycosis.—This form is the result of eating diseased meat, or drinking milk from infected animals, and resembles ptomain poisoning from other sources. It may begin with a chill, nausea, vomiting, and diarrhea following quickly.

There is pain in the head and back, and great restlessness, sometimes accompanied by delirium and convulsions. There is dyspnea, and sometimes the patient becomes cyanotic. Hemorrhage is likely to occur from the stomach, bowels, and mucous surfaces. In some cases, small phlegmonous, carbuncular inflammation, or petechia, appears upon the skin. The fever is moderate in character. When it terminates in death, a frequent occurrence, it is usually preceded by heart-failure and collapse.

Wool-sorter's Disease.—This form occurs among workers in factories where wool and hair are assorted, especially the product from Russia and South America, where the disease prevails to such an alarming extent. The separation of the wool, and hair creates more or less dust, and this, either swallowed or inhaled, produces the disease.

There are but few premonitory symptoms, the patient being seized with a chill, attended by great prostration, the pulse being small, quick, and feeble. The temperature reaches 102° or 103°.

The general symptoms may be those of a respiratory or gastro-intestinal infection, or both. The breathing is hurried, there is a sense of constriction of the chest, with cough, and symptoms of a bronchitis or pneumonia follow. Vomiting and diarrhea may accompany the above, while the cerebral symptoms may be scarcely perceptible, or of the most intense character.

The disease usually terminates fatally in from three to five days. Ball states that if the patient survive a week he will recover.

Rag-picker's Disease.—Eppinger has identified this as anthrax, the

same as wool-sorter's disease, and it is found among rag-sorters working in the large paper-mills where infected rags are found. The symptoms are similar to those just described, and need not be repeated.

Diagnosis.—The fact that the patient is a worker among animals or their products, together with the appearance of a papule, rapidly changing to a vesicle, its rupture of bloody material followed by a black scab and great edema of surrounding tissue, makes the diagnosis comparatively easy.

The internal form, however, is not so easily recognized, and if we overlook the occupation of the patient, a mistaken diagnosis is very apt to occur, the symptoms being similar to ptomain poisoning from other sources, such as canned goods, mushrooms, milk and its products, etc.

Prognosis.—The prognosis may be favorable in external anthrax, when occurring in strong, healthy individuals, and when seen early, but the internal form is very grave, and the prognosis should be guarded. If the patient lives over the first week, he will most likely recover.

Treatment.—Eclectic remedies have not been tried in this disease, and we are able to say but little as to their effect; but, judging this by other infectious diseases where there is rapid infection, we would expect good results from echinacea, baptisia, the sulphites, chlorates, and mineral acids, as they might be indicated. The system should have all of these remedies that it will bear, and the local disease washed with the same.

Extirpation, probably, has served a better purpose than the cautery, though we are to remember that the patient dies from the systemic poisoning, rather than as a result of the local lesion. Cleanliness, antiseptic measures internally and locally, quiet in bed, and good nutrition will form the most successful line of treatment.

HYDROPHOBIA.

Synonym.—Rabies.

Definition.—A specific infectious disease peculiar to animals, especially the dog, and communicated to man by inoculation, generally by a bite. It is characterized in man by melancholia; great fear of water; violent

spasms of the pharynx and larynx, rendering deglutition and respiration very difficult; great prostration, a stage of paralysis, which generally terminates in death.

Etiology.—The specific cause has not yet been determined, though bacteriologists agree that it is microbic in origin, that a toxin is developed which infects the saliva and blood of the victim. This is communicated to man in about ninety per cent of all cases by the bite of a rabid dog.

The presence of saliva, however, on an abraded surface is sufficient to produce the disease. Of domestic animals liable to rabies, the cat, horse, and sheep are next in order, while a number of wild animals are susceptible, and when infected lose their shyness, timid animals becoming bold.

Many persons seem immune, as only about twelve to fifteen per cent of the persons bitten contract the disease. The degree of immunity, however, most likely, is the result of the part bitten. Thus Ballinger states that ninety per cent of all persons bitten in the face contract rabies, while only a small per cent are affected when bitten on covered parts of the body, the virus being wiped off by the intervening clothing.

It is quite rare in the United States, while in Russia it is quite common. The toxin seems to spend its force upon the central nervous system.

Pathology.—The pathological changes found after death are not different from those in some other diseases, hence are not characteristic. Thus we find congestion of the mucous membrane of the pharynx, larynx, trachea, and bronchi, and sometimes of the lungs.

The abdominal viscera is not affected. The blood-vessels of the cerebro-spinal system are congested, and sometimes minute hemorrhages occur. These are most marked in the medulla and upper part of the spinal cord, but may be entirely absent.

Symptoms.—The period of incubation is longer than that of any other known disease, and varies greatly in different cases, usually a shorter time in children than in adults. The intensity of the virus and location of the wound, in all probability, determine to some extent the time of the forming stage. When the injury is large and on the face or head, the toxin does its work more quickly.

From two weeks to three months is the usual period, though it may be prolonged to one year or more. The wound frequently heals as readily from the bite of a rabid dog as from one not affected.

Prodromal symptoms are headache, loss of appetite, and a depression that is somewhat characteristic, the patient being melancholy, with the sense of impending danger. There may be a stinging sensation or itching at the seat of the bite, and the part becomes numb; sometimes the cicatrix becomes red and swollen. These symptoms last from one to three days.

The patient is restless and uneasy, and the slightest noise, a flash of light, a draft of air, or a sudden call, will produce undue excitement; or the patient sits quietly in a despondent mood, with an occasional sigh. As the disease progresses towards the spasmodic or true hydrophobic stage, respiration becomes oppressive and the voice rough, and a seizure may be expected momentarily; this stage lasts from one to three days.

The second stage is characterized by spasmodic contraction of the larynx on attempts at swallowing. The sight of water produces great fear, and often precipitates a spasm which is attended with great suffering; the dyspnea is great, and the convulsive action of the larynx and muscles of the mouth causes the patient to emit guttural sounds, which, to the excited and horror-stricken observer, seem to resemble the bark or howl of a dog. The temperature is usually slightly elevated, from 100° to 103°, though the temperature may be subnormal.

These paroxysms occur at intervals; when the seizure subsides, the mind is perfectly clear, though the patient is greatly exhausted. In extreme cases, the patient is maniacal, and must be prevented from injuring himself or attendant. This stage lasts from one to three days, and gradually passes into the third stage, known as the paralytic stage.

The paroxysms become less violent, the patient being able to swallow with some difficulty, the prostration is great, the heart's action feeble, the skin is relaxed, and the surface is covered with a cold sweat. The mind, which has been clear during the interval of intense suffering, now becomes clouded, and the patient finally passes into coma, the spasms entirely subside, and in from ten to twenty hours the patient expires.

Although the incubating stage may be longer than that of all other diseases, the duration of the disease is, fortunately, very short, from two to four days.

Diagnosis.—After the disease is once fully developed, there is but little difficulty in making a diagnosis. The spasm of the muscles of deglutition and respiration, the intense fear of water, the excitation of the patient on the slightest irritation, are so characteristic that one could scarcely be mistaken.

In tetanus, which slightly resembles rabies, the disease develops in from five to ten days, begins with trismus, and very often is attended with episthotonos.

Pseudo-hydrophobia—lyssophobia—somewhat resembles hydrophobia, but is purely neurotic, and occurs in hysterical individuals.

A person with a vivid imagination and of a highly excitable temperament, after being bitten by a dog, develops, in a few weeks, symptoms that may be misleading. He declares that he can not swallow, grasps his throat, breathes with difficulty, and to all appearance, has the true disease. It will be noticeable, however, that the attacks are not so severe, that the first week passes without the patient growing worse, and that the temperature remains normal.

Prognosis.—The prognosis is always unfavorable.

Treatment.—*Prophylaxis.*—The surest method would be, the muzzling of all dogs, as has been proven in Prussia, and later in Holland. In the former country hydrophobia was quite common previous to compulsory muzzling, but since its enforcement the disease has been eradicated.

When a patient has been bitten, the wound should at once be treated, and the poison removed by suction or the use of cups, or the injured part excised. Of course the patient would need to be seen very soon after the injury took place. If this course is not followed, then the wound should be thoroughly cauterized with carbolic acid, caustic potassium, or the actual cautery, and the wound kept open for a few weeks.

When the disease is fully developed, the treatment will be for the purpose of relieving the patient's suffering. Inhalations of chloroform and hypodermic injections of morphia are the most efficient means for

this purpose. The patient should be placed in a dark room, quiet enjoined, and all visitors forbidden. As a curative measure that needs to be tried, I would suggest large doses of echinacea, as recommended by Dr. Goss. The hypodermic injection of gelsemium is also worthy of trial.

Dr. Pasteur's preventive inoculation, that was expected to do so much for the world, has been a disappointment. Pasteur institutes were established in various parts of the world, and the zeal with which the method was used may account for the increased number of cases of rabies over former years.

TETANUS.

Synonyms.—Lockjaw; Trismus; Opisthotonos.

Definition.—An acute infectious disease, recognized as caused by the bacillus tetanus, and characterized by painful spasmodic contraction of the voluntary muscles, most frequently those of the jaw, face, and neck; less frequently those of the trunk, the extensors of the spine and limbs. It has occurred as an epidemic during times of war. In the new-born it is known as Trismus Neonatorum.

Etiology.—The tetanus bacillus was first discovered by Nicolaier, though Roenbach first found it in man, and Kitasato made the first cultures. This bacillus gains entrance into the system through a wound of some character, the most favorable being a puncture or bruise.

The bacillus tetanus is a long, slender rod, terminating in a bulbar enlargement, the spore, and giving it the appearance of a pin or drumstick. As but few of the bacilli are found in the wound, and few or none in the blood, it is now generally believed that the infection is due to a chemical product, tetanin or tetano-toxin, isolated by Brieger. Tetanus then is purely toxic in character.

The spores are found in earth and manure, in stables or streets, near polluted streams, and also in the dust from hay or the cobwebs found so abundantly in ill-kept stables. The spores retain their activity and infectious character for years; thus Babes found the spores remain very virulent after being dried on wood, for two and a half years, without any especial protection.

Pathology.—The post-mortem lesions are neither positive nor constant. The nerves are sometimes found red, swollen, and inflamed, and in some cases granular degeneration of the nerve-cells takes place. The anterior horns of the spinal cord are usually injected, and sometimes softened.

Method of Invasion.—The infection usually enters by way of a wound, especially of the hands or feet, and a punctured wound rather than an incised one; a crushing injury, a fracture or dislocation, and in one case that came under my observation, from the cutting of a wisdom tooth.

Age, race, and climate may be mentioned as predisposing to lockjaw, from ten to twenty years being the most susceptible age, excepting tetanus neonatorum, which generally occurs during the first week of life.

The colored races are far more subject to the disease than the white, and it prevails more frequently in warm than in cold climates. The proportion of males who suffer compared to females is six to one, due no doubt to the greater frequency of injury in the male.

Symptoms.—The period of incubation is from seven to fourteen days, often less than ten. Of seventy-five cases reported by Faber, seventy-four per cent had a forming stage of from seven to eleven days.

The first symptom is a sensation of stiffness and soreness of the jaws and neck; this may rarely be preceded by chills or rigors. The soreness increases, mastication being painful and difficult; these increase, terminating in a spasm of the masseters, giving rise to trismus or lockjaw. There is also spasm of the muscles of the neck. The eyebrows are elevated, the corners of the mouth are everted, which gives rise to the condition known as sardonic grin—*risus sardonicus*. Gradually the convulsive action continues till nearly all the muscles of the body are involved save the hands and wrists.

The contractions, while continuous, are relieved at intervals by slight relaxation, only to be followed by contractions of increased intensity. During a paroxysm the head is drawn back, the powerful contraction of the muscles of the back produce a bending of the body, so that the weight of the person rests upon the head and heels—*opisthotonos*. In rare cases the body is arched forward—*emprosthotonos*; or it may be curved laterally—*pleurothotonos*. During an excessive spasm there may

be a rupture of the muscles.

Any slight exertion will bring on a spasm, and, later, even a sudden noise will bring on a convulsion. During a severe paroxysm the chest is contracted, the diaphragm is restricted, and the respiration is greatly impaired. The spasms are attended with acute lancinating or excruciating pains, and though the patient's mind remains clear and he is conscious of his intense suffering, the viselike contractions render him unable to cry out.

A copious perspiration bathes the body; inability to eat or drink, coupled with the severe attacks, produces extreme exhaustion. The spasmodic contraction of the sphincters causes constipation and retention of the urine. The temperature may remain normal throughout, or, owing to disturbance of the heat centers, it may rise to 103°, 104°, 105°, or as high as 108° or no°.

Chronic Tetanus.—In this form, there is a longer period embraced in the forming stage. The same symptoms observed in the acute will in time be enacted in the chronic, with the exception that a paroxysm is followed by an interval of varying duration when there is relaxation of the muscles and freedom from pain, save a soreness of the muscles. During this interval the patient is enabled to take nourishment and stimulants, thus preventing the exhaustion seen in the acute attacks.

Where recovery takes place, which occurs far more frequently than in the acute form, the spasms occur at longer intervals and in lighter form, till they cease entirely. Relapses may occur, however, when least expected, and the case terminate fatally.

Diagnosis.—The history, showing injury in most cases, the period of incubation lasting four or more days, the locked jaws and stiffness of the neck, the muscular contractions spreading downwards, the hands and arms escaping, the continued rigidity during the intervals of the spasms, are symptoms so pronounced that the diagnosis is not difficult.

Strychnin poisoning, the disease most likely to produce confusion, is followed almost immediately upon its ingestion by muscular contraction; there is usually gastric disturbance, and during the absence of a spasm there is relaxation. The course of the latter is also much shorter, death or recovery occurring within twenty-four or forty-eight hours.

Prognosis.—The prognosis must be guarded; in infants, and when the result is due to deeply penetrating wounds, the termination is usually death. Every day the patient survives after the fourth day makes the prognosis more favorable. In chronic cases, a more hopeful prognosis may be given.

Treatment.—*Prophylaxis.*—In all traumatic cases, the wound should be carefully examined, and all foreign material removed, and the wound cauterized. The patient should then be placed in a darkened room, and kept free from all curious visitors, noises, and everything that would tend to cause irritation. Sometimes the slightest sound is sufficient to bring on a paroxysm.

To relieve the intense pain, morphia may be used hypodermically. The remedies, however, that will be most useful will be lobelia and gelsemium, together with the vapor bath. Dr. Waterhouse, of St. Louis, Mo., reports in the *Eclectic Medical Journal*, October, 1891, a severe case, cured by gelsemium when all other remedies had failed. He gave the remedy in thirty-drop doses every hour by mouth, and thirty drops hypodermically every six hours.

Dr. W. H. Huntly, of Australia, also reports in the same journal, November, 1893, a cure where the principal remedy used was lobelia. Dr. Wolgemuth, of Springfield, Ill., also gives a very interesting account of a cure where the use of lobelia per mouth and rectum were the chief means used. These are but a few cases of many that might be cited where these remedies turned the tide in favor of the patient. I would lay stress on the use of lobelia per rectum. Often the jaws are so firmly locked as to prevent swallowing; here thirty drops of gelsemium hypodermically, and one or two drams of lobelia per rectum, will produce the desired relaxation, when agents can not be given by mouth. The vapor bath will prove a great aid to the means already mentioned.

Where there is evidence of sepsis, the treatment will be antiseptic. It may be the sulphites, the chlorates, the mineral acids, or the well-known vegetable antiseptics, echinacea and baptisia.

As the disease is attended by great prostration, nourishment will be an important feature of the treatment. When locked jaws prevent feeding by mouth, rectal feeding should be practiced.

INFECTIOUS DISEASES OF DOUBTFUL NATURE.

FEBRICULA.

Synonyms.—Ephemeral Fever; Simple Continued Fever; Synochal Fever.

Definition.—A slight transient fever of doubtful etiology, unattended by any characteristic lesions, and terminating in recovery in from twenty-four hours to seven days.

“In malarial regions, *periodic* fevers are the rule; in non-malarial regions, in the majority of years, the disease is *evanescent fever*, or, as it has been lately described, febricula. Of this we have two varieties,—one which may be strictly termed *evanescent*, passing off by the third or fourth day; the other *protracted*, and which terminates from the sixth to the ninth day.”

Etiology.—A number of conditions predispose and possibly cause febricula, among which may be mentioned colds, retained secretions, prolonged physical or mental effort, gastric disturbances from overeating, or from tainted foods or hurriedly eating while overheated, from exposure to the sun or excessive heat, and to inhalation of sewer-gas or other noxious odors.

Anders speaks of “undeveloped or abortive forms of the *infectious diseases* (typhoid, influenza, rheumatism).” Evanescent fevers frequently occur during epidemics of the above-mentioned diseases, and may be due to a modified infection.

Symptoms.—The disease begins abruptly. Commencing in the morning with a slight chill, the temperature rapidly ascends to 103°, but instead of falling through the night, as in other cases, it is 104° the next morning. Then there is a gradual decline through the day to 100°, a slight increase through the night and entire subsidence of febrile symptoms on the third day.

“Any one that has suffered from this evanescent fever will see that Fig. 15 is a correct index of his sensations. Commencing in seeming perfect health, there is a chill, with febrile symptoms increasing through the

day; then follows a restless night, the person suffering from headache, pain in the loins, and a burning fever,—the broken sleep being attended with unpleasant dreams; the feeling of exhaustion in the morning; the gradual improvement during the day; the second uncomfortable night, but not near so bad as the first; breakfast on the third morning, followed by a pleasant feeling of relief and rapid convalescence.”

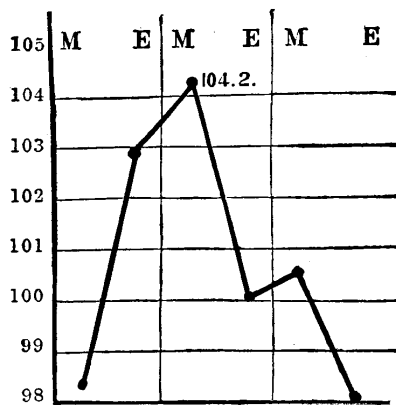


FIG. 15. RANGE OF TEMPERATURE IN A CASE OF FEBRICULA. (Scudder.)

Sometimes the fever takes a slightly different course as seen in the second diagram. The elevation of temperature the first

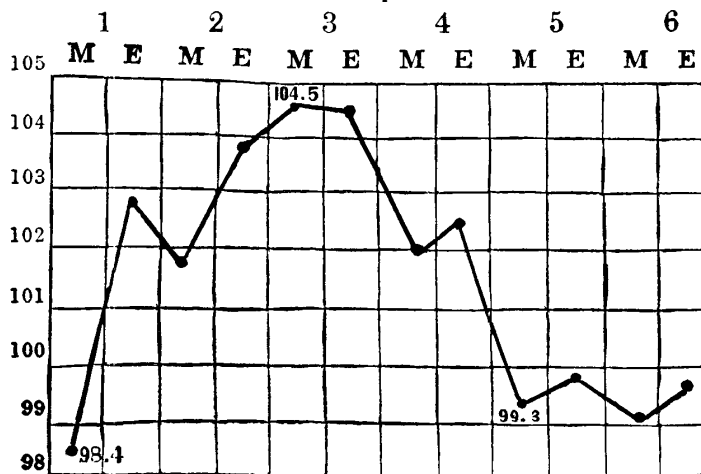


FIG. 16. RANGE OF TEMPERATURE IN A CASE OF PROTRACTED FEBRICULA. (Scudder.)

day is about the same, but the patient passes a better night, and the morning temperature is below 102°; there is then a continued increase during the next day to 104°, and a bad night carries it up to 104.5° the next morning. During the third day the patient is very sick, and suffers more than in the grave forms of fever, the temperature continuing uniform. Then we notice a marked decline on the fourth day, and the low range of temperature from that until the entire subsidence of the

disease.

“Synochal and Synochoid Types.—Sometimes, owing to a more intense character of the exciting cause or to greater depression of the system, the fever assumes a still more grave form, and is known as synochal or synochoid, according to the length and gravity of the fever.

“In synochal fever there are but few premonitory symptoms, the onset being more or less sudden. The patient's attention is often first arrested by chilly sensations passing over the body, and a sense of dullness and languor. Sometimes the chill is well marked, in rare cases amounting to a rigor, but often the sensation of cold is but slight.

“This chilliness is rapidly followed by reaction; the skin becomes injected, dry, hot, and burning; the countenance flushed and animated; the pulse frequent, full, strong, and bounding, rarely hard and oppressed; respiration is frequent, the respired air hot, and the mouth and nostrils dry; the bowels are constipated, and the urine scanty and high-colored; the tongue white, its papillae elongated and erect. The patient experiences great thirst, and manifests increased sensibility, especially in regard to light and noise. There is frequently some headache, with sometimes vertigo, and the patient is watchful, restless, and uneasy. In children it may commence with a convulsion.

“As the disease progresses, these symptoms increase in severity; the secretions are still further arrested, the heat and dryness of the skin increase, and the patient is more watchful and uneasy. All the symptoms are usually more exasperated in the evening and early part of the night. The fever continues to increase in intensity until about the fifth or sixth day, when there is a tendency to a crisis, and the disease is frequently arrested by the establishment of secretion. If it progress much beyond this period, we observe a manifest prostration, the symptoms being those of synochoid ; and in the course of as many days more, marked evidence of disorganization of the blood and typhoid symptoms. We rarely, if ever, see the disease terminate fatally as a synochal fever, unless complicated with inflammation of some important organ.

The temperature in synochal fever has a pretty high range. Yet the wave-lines or difference between morning and evening temperature are well marked. The following table gives the variations of temperature in a fever terminating the fifteenth day:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Evening		103.5	105	105.5	106	104	106.5	105	104.5	104	104.5	103.5	103	101	
Morning	99	102	102	103	103.5	101.5	104	102	102	102	101.5	100	100	99	98

“In a case developing *typhoid* symptoms in the third week, from improper treatment, we find the following range of temperature from the thirteenth day until death:”

	13	14	15	16	17	18	19	20	21
Evening	105	105.5	100	105.5	107	106.4	105	106	108.5
Morning.....		104	104.3	105	106	105	104.5	105	106.5

The synochoid type is of longer duration and shows greater depravity of the blood; in fact, very closely resembles typhoid fever.

“The stage of incubation is generally of some days’ duration, though when the cause is intense, it may be brief. The patient complains of languor, indisposition to exertion, loss of appetite, irregularity of bowels, dryness of skin, and more or less pain in head or back, and soreness of muscular tissue. These symptoms increasing, at last a tolerably well-marked chill comes on; the patient feels cold, especially at the extremities, and chilly sensations pass over the body. These are shortly alternated with flushes of heat, which become more and more marked, until febrile reaction is established.

“In rare cases, the cold stage is as well marked as in an intermittent, amounting to a rigor; in many, the patient hardly notices the cold stage, it is so slight.

“With the development of reaction, the skin becomes hot and dry, the urinary secretion scanty, high-colored, and does not deposit a sediment, and the bowels are constipated. The mouth is dry and the tongue coated with a slightly yellowish white coat, or, in some cases, a heavy yellowish coat on base, with a bad taste in the mouth and slight nausea; in others, the gastric mucous membrane being irritable, it is elongated, the tip and edges reddened, but coated white in the center; there is thirst, but not so intense as in the preceding form of fever. The pulse is frequent, full, sometimes hard, especially if there is irritation of the mucous membranes, or cerebro-spinal centers, but rarely bounding. In some cases there is nausea and even vomiting; but if so, the tongue will either be found heavily coated at base, with a disagreeable taste in the mouth, and sense of oppression in the epigastrium, or pointed, with reddened tip and edges, and tenderness on pressure over the stomach.

“The condition of the nervous system is variable; sometimes the patient is restless, uneasy, and watchful, the special senses being painfully acute, so that the patient can not bear a bright light, and is disturbed by the slightest noise; at others, he lies torpid, does not appear to appreciate his condition, is but slightly affected with what transpires around him, and lies quiet in one position. In either case there may be headache; in the first .it is acute, the face being flushed and eyes reddened, evidencing determination of blood; in the last it is generally dull, a disagreeable sensation of heaviness and oppression.

“The symptoms above named increase in intensity to the third or fourth day, after which the fever exhibits but little change, if uncomplicated, except the increasing debility, until after the seventh day; when, if it does not terminate by the establishment of secretion, either naturally or by the aid of medicine, we observe symptoms of deterioration of the blood and prostration making their appearance, and after a variable length of time a low typhoid condition ensues, and we have, in fact, to treat a fever of the next variety, less the disease of Peyer's glands.

“*Temperature.*—The range of temperature in this form of fever is not very different from that represented in the diagrams of typhoid fever. In the milder cases, the evening range is from 102.5° to 104° ; the morning range from 100.5° to 102.5°. In the severer cases we find, during the first week, the high range of evening temperature, and long wave-line of synochal fever; and as it advances in the third week, the diminished wave-line, or high morning as well as evening temperature.

“We may thus readily determine the progress of the disease and the prospect of its speedy arrest. A low range of temperature, with long wave-lines, gives a favorable prognosis. Even though the fever is severe, the evening range of temperature being high, if there is the large wave-line (low morning temperature), our remedies will act kindly. It is in these cases in which we have a high morning temperature and, of course, short wave-line, that we fear difficulty.”

Complications.—Febricula is often associated with sore throat, tonsillitis, irritation of the larynx, bronchial catarrh, and gastro-intestinal disease.

Synochal fever is apt to be associated with inflammatory diseases of the respiratory apparatus, determination and congestion of the brain, and gastric irritability.

Synochoid fever is frequently complicated with local diseases, most generally of an inflammatory character; yet, as the fever is fully developed before the local disease commences, the symptoms of the latter are often very obscure.

“With Predominant Affection of the Cerebro-Spinal Centers.—This forms the nervous fever of older writers, and is not an uncommon disease. The symptoms are all increased in intensity; the skin is intensely hot and pungent, especially of the head and face; the pulse is rapid, strong, and full; the breathing frequent and suspirous, and the eyes injected and suffused. There is great irritability and restlessness, with more or less intense headache, giddiness, intolerance to light and noise, and greatly increased general sensibility. Within three or four days, delirium makes its appearance, followed in a longer or shorter time by coma-vigil, coma and insensibility, and by subsultus tendinum.

“In some cases, the cerebral affection being intense, we find stupor making its appearance speedily, accompanied by a slow, oppressed, and intermittent pulse. If the affection of the nervous centers is acute, the disease may terminate fatally without much disorganization of the blood; but if not, the fever rapidly assumes a typhoid character.

“With Predominant Affection of the Respiratory Apparatus.—This is the most common complication of continued fever, though, generally, it exists in but a slight degree. The bronchial mucous membrane is frequently irritated, with slight implication of the lungs. This necessarily aggravates the fever, and induces farther complication by preventing proper oxygenation of the blood. The patient complains of slight oppression and difficulty of breathing, with accelerated respiration and slight cough. If bronchitis is fully developed, the difficulty of breathing is increased, and secretion is generally established early, and a mucous rhoncus is heard over the chest, upon auscultation. If much of the structure of the lung becomes diseased, the breathing is hurried, oppressed, and sometimes laborious, the sputum rounded and streaked with blood, and in a short time exhibits the characteristic rusty color of pneumonia. There are manifest symptoms of imperfect aeration of the blood, dark, dusky hue of the lips, and tongue, flushed appearance of face, oppressed circulation, and coldness of the extremities. With such complications, we notice that prostration is very rapid, and contamination of the fluids speedily ensues, with typhoid symptoms. Low delirium and coma are frequent attendants upon this condition.

“With Predominant Affection of the Gastro-Enteric Mucous Membranes.—In some cases we observe, at the commencement, marked symptoms of disorder of the stomach; the tongue is heavily coated, especially at its base, with a dirty-yellowish secretion; there is slight nausea; disgust for food, and oppression in the epigastrium; everything that is administered is taken by the patient with difficulty, and frequently ejected. This condition is not generally accompanied with as high febrile reaction as in the uncomplicated fever; but there is rapid prostration, and manifestation of typhoid symptoms. In this case there is increased secretion of mucus from the mucous membrane of the stomach, which, if allowed to remain, will undergo decomposition, and, being slowly absorbed, will generate decomposition of the blood. In other cases there is marked irritation of the stomach, manifested by redness of the tip and edges of the tongue, uneasiness in, and pain on pressure over, the epigastrium, with nausea and rejection of fluids and solids taken into the stomach. In this case, all the febrile symptoms are increased.

“The enteric affection does not generally manifest itself in the early stage of the 'disease. It commences with looseness of the bowels, two, three, or four evacuations in the twenty-four hours, with pain and soreness in the abdomen, especially on pressure. The tongue is moist and loaded with a dirty-white or grayish fur, which, as the fever advances, changes to brown, and sordes appear on the teeth and lips; in some cases, the edges and tip of the tongue are reddened. In this case, the fever rapidly assumes a typhoid character.”

Diagnosis.—The diagnosis of febricula is not difficult if we remember its chief characteristics; namely, the sudden onset, high temperature, 104° or 105° within twenty-four hours, and great restlessness and undue complaint, notwithstanding the tongue is comparatively clean and moist, and the absence of hardness of pulse, although very rapid, and the early decline of all of the above seemingly grave symptoms, render the case quite plain.

In synochal fever, the continued reaction determines the type of the fever; the great excitation of the nervous system, with but little prostration, and the full, bounding pulse, distinguish it from synochoid or typhoid.

In synochoid, the history of a slow forming stage, the uniform

temperature after the fourth or fifth day, and the tendency to septic conditions, determine the type of the fever. Where complications have arisen, the symptoms are usually sufficiently pronounced to determine the local lesion.

Prognosis.—The prognosis is favorable in all cases of febricula, and in the graver forms of synochoid, with careful treatment, the mortality will be very small.

Treatment.—The treatment for febricula is quite simple. To a half glass of water add five drops of aconite, if the pulse be small; or twenty drops of veratrum and ten drops of gelsemium, if the pulse be full and bounding; of this give a teaspoonful every hour. A seidlitz powder for the bowels, and cooling lotions for the head, will be about all the medicine required.

In the synochal form, sthenia is the most characteristic feature, and our medication will be directed to overcoming the force and frequency of the circulation, relieving the irritability of the nervous system, and establishing secretion from the skin, kidneys, and bowels.

The full, bounding pulse speaks of excessive heart power, while the Hushed face, bright eyes, and contracted pupils tell of nervous irritability. Here,—

Veratrum	20-60 drops.
Gelsemium	15-30 drops.
Water	4 ounces. M.

Sig. A teaspoonful every one or two hours till the pulse loses its force and frequency, and the irritability of the nervous system is overcome.

Generally, as these remedies accomplish the purpose for which they are given, the secretions become established; if, however, this desired end is not accomplished, we commence the administration of remedies for the kidneys and bowels, continuing the sedative, however, as before. A dose of antibilious physic, followed by a diaphoretic powder, accomplishes the desired end. Should complications arise, we treat them according to the symptoms present.

The synochoid form is more of an asthenic type, and requires somewhat different medication. The patient is more passive, the temperature not so

high, and the tendency is to typhoid symptoms with sepsis of the blood.

The treatment is along the same line as that of typhoid, and does not need a repetition at this time, other than to say we must keep the stomach in good condition, control the circulation, correct the wrongs of innervation, and overcome sepsis. The diet and nursing will be the same as for typhoid. (See treatment for typhoid.)

DYSENTERY. (SEE DISEASES OF THE INTESTINES.)

MILK SICKNESS.

Definition.—An infectious disease occurring in man and animals, in the latter known as “trembles.”

The disease is more frequently met with in Western States, where it sometimes occurs with fatal effect.

The **pathology** of this disease has not been carefully studied.

Etiology.—It is presumed to be due to some poison derived from the earth. The disease attacks cattle, horses, and sheep, and occasionally undomesticated animals. Where this so-called “trembles” is met with in cattle, men suffer from milk sickness.

The poison may be communicated through milk, cheese, or butter. It occurs in the summer and fall and more usually in adults.

Symptoms.—The prodromal symptoms are anorexia, headache, and fatigue.

Fever is present in a slight degree, accompanied by severe thirst and constipation.

Convulsions may arise and typhoid symptoms may later develop.

The *Diagnosis* is made generally through the coincident prevalence of “trembles” in the cattle.

The *Prognosis* is generally favorable.

Treatment.—The treatment is almost entirely prophylactic. The symptoms may call for echinacea or baptisia or other indicated remedy.

RARE INFECTIOUS DISEASES.

Under this heading we might include a description of *Mountain Fever*, *Weil's Disease*, *Schlammfieber*, *Malta Fever*, and *Miliary Fever*, but these are rarely met with, and their pathology and treatment have not been extensively studied.