

him to his room for a week or two. He escaped the paroxysm only by going to the sea-shore before the expected time, and remaining there through the time during which it would have lasted.

Hay-fever is the name often given to such periodic attacks coincident with the hot weather. In a number of cases, the application to the nostrils of a saturated solution of *sulphate of quinine* has arrested the paroxysm in a day or two, several different years.¹

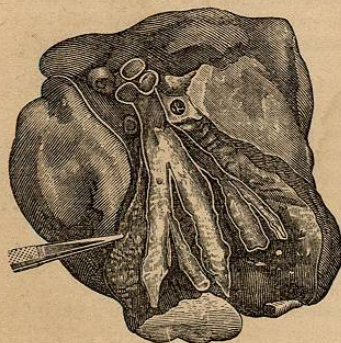
Dr. W. Moss, of Philadelphia, in his own case and in others, has found the hypodermic injection of morphia to give great relief. Dr. Hoover, of Ohio, shortened the duration of two cases by *atomization* with solutions of chlorate or bromide of potassium with morphia.

In asthmatic persons generally, nothing is more important than prudence and regularity in diet and regimen.

BRONCHIAL DILATATION.

This (synonym, *bronchiectasis*), of which extreme degrees are not common, is of interest chiefly because it is possible for it to be mistaken for phthisis. There are two forms, the *tubular* and the *saccular* enlargement.

Fig. 60.



Dilated bronchi.

In either, slight dulness on percussion may occur, from condensation of the lung around the expanded part. Sonorous rhonchus and coarse mucous râle exist, the latter especially in the saccular form. In this, the signs are almost identical with those of tubercular excavation; but they occur usually at the middle or lower part of the lung, and are stationary, as they are *not* in tuberculization.

Dr. Gairdner describes the formation of ulcerative ex-

cavations of the lung communicating with the inflamed bronchi as "bronchial abscess."

Cough, very troublesome, and attended by copious mucous or slightly purulent expectoration, is common in bronchial dilatation. The palliation of this symptom, with care of the general condition of the patient, is all that can be accomplished for it in treatment.

¹ Prof. Helmholtz, of Berlin, having been subject to "hay-fever," ascertained in 1868 that the secretion from his nostrils during the attacks contained a number of minute vibrio-like bodies, absent at other times. In view of the action of quinine in destroying infusoria, he applied a solution of it to his nostrils, with excellent effect. Drs. Frickhöfer and Busch have obtained like results. See a letter from Prof. Binz, of Bonn, to Prof. Tyndall, in *Nature*, May 14, 1874.

LARYNGITIS.

Slight inflammation or congestion of the mucous membrane of the larynx is very common as the result of cold; its signs being hoarseness, with a dry, short, harsh cough and some soreness in drawing a breath. But simple acute laryngitis of severe grade is quite a rare affection.

When it occurs, there is fever, with hoarseness, "brassy" cough, distressing dyspnoea, and difficulty of swallowing. *Edema glottidis*, or submucous effusion of serum, constitutes the greatest danger in laryngitis; the tumefaction obstructing respiration to a degree often fatal. This disorder is almost exclusively met with in adults.

Early purging, the application of leeches, the internal use of ipecac, in doses just short of nausea, with moderate quantities of opium, and the frequent inhalation of the steam of boiling water, constitute the best treatment. If dyspnoea become decidedly serious, threatening asphyxia, tracheotomy is advised. Some account of this operation will be given in connection with croup.

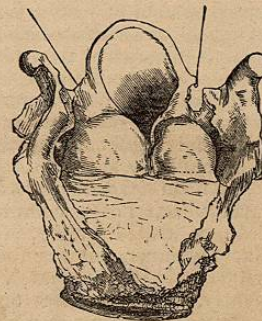
Edema of the glottis may be produced immediately by the ingestion of boiling water, or of sulphuric or nitric acid, which has often accidentally happened.

Chronic laryngitis, with ulceration, is a not infrequent attendant on phthisis. Some cases of the latter begin with it; in others it occurs somewhat late in the course of the disease. Syphilitic ulceration of the larynx is tolerably common, as a secondary symptom. This, as well as polypi or other tumors of the larynx, may be discovered, and treated by operation for removal, or with solutions of nitrate of silver, etc., through the aid of the laryngoscope.

My confidence in the utility of very strong solutions of nitrate of silver in chronic inflammations of the mucous membranes, of the throat or elsewhere, has not increased, in fact has not been sustained, by what I have seen in practice. Dr. Horace Green and others have made frequent use of it of the strength of sixty grains to the ounce. Except for *ulceration*, which may benefit even by the solid caustic, I believe that from four to ten grains in the ounce of water will do more good, in almost all cases, than the stronger proportions.

The application of *nebulized liquids*, by apparatus for *atomization*, is now in vogue in both acute and chronic laryngitis. Some remarks upon this have been made already, under *General Therapeutics* (Part I.). Vapor of water containing laudanum, hops, or hyoscyamus, will probably do the most good in laryngitis.

Fig. 61.



Edema of the glottis.

APHONIA.

Loss of voice may be transient or permanent; and either functional or structural in its origin. Especially in hysterical females, a nervous shock may produce a *paresis* or enfeeblement of the vocal power, lasting often for days together. I knew of one such case in which a young woman could only speak in a whisper for more than three months. A *choreic* affection of the vocal apparatus is now and then met with; stammering is, in fact, analogous to this; depending on a want of command and co-ordination of the vocal muscles.

Faradization, *i. e.*, the use of induced electrical currents (as magneto-electricity), carefully applied, has sometimes cured nervous or hysterical aphonia.¹ I have known vesication of the back of the neck to be useful for it.

Congenital dumbness, except in idiots, is due to deafness, making the learning of speech impossible, unless by a recently invented system of instruction by sight.

Organic or structural aphonia is caused by lesions of the larynx, such as ulcerative destruction of the vocal cords, tumors, etc., which are to be diagnosed by laryngoscopy.

Feigned dumbness is detectable by careful watching, or, in the last resort, by *etherization*. In the stage of early excitement, or when reviving from anaesthesia, the pretender will betray himself by involuntary speech.

The term *dysphonia clericorum* has been applied to an affection of the throat not uncommon among clergymen and other public speakers, called by Dr. Horace Green "follicular disease of the pharyngo-laryngeal membrane." Its symptoms are soreness and irritation in the throat, with disposition to hawk and spit frequently, and hoarseness or partial loss of voice. On inspection, the fauces, pharynx, and glottis are found to be of a reddish granular appearance, with more or less enlargement of the mucous follicles, and, in severe cases, a muco-purulent secretion about the uvula. Sometimes, however, the membrane is dry.

A conventional treatment for this affection has been the application every day or two of a solution of nitrate of silver, with a brush or probang. Saturated solution of tannin is also used for it. My belief is that, if these local remedies do not begin to relieve in a week or two, the frequent swallowing of small pieces of ice, or gentle gargling several times a day with ice-water, may be substituted with advantage. Counter-irritation over the throat, especially by croton oil, should, if necessary, be persevered in for a considerable time. Three drops of the oil (diluted with as much sweet oil for a delicate skin) may be rubbed over a limited space in front of the throat every night until a papular eruption comes out.²

Dr. J. W. Corson³ asserts that relief will often be given when

¹ Dr. Morell Mackenzie has pointed out that a shrill cough or the slightest dyspnoea should forbid the use of electricity for aphonia.—*The Practitioner*, vol. ii.

² Patients should be cautioned, of course, against allowing the oil to come near the eyes. I have known a severe ophthalmia to result from neglect of this.

³ N. Y. Medical Record, Jan. 1, 1873.

the voice has been suddenly lost, by slowly dissolving in the mouth and partially swallowing a piece of borax, containing three or four grains of the salt.

Many cases of this complaint are as much constitutional as local in origin. Where real dysphonia (difficulty or imperfection of vocalization) exists, public speaking or singing must be avoided, to allow the organs repose. Tonics and change of air may often prove the best measures of treatment.

LARYNGISMUS STRIDULUS.

This is an infantile affection, consisting in spasmodic closure of the glottis, causing a stridulous or shrill whistling respiration. It is most apt to occur during dentition, but is not very common. Its onset is sudden, and its duration brief. Though exceedingly alarming, it is seldom fatal. Of 52 cases recorded by Prof. Henoch, of Berlin, 33 were between 9 and 30 months of age, and 19 between 2 and 9 months.

The treatment must be prompt; producing derivation by slapping the back and limbs, and putting the feet into hot water, while cold water is applied to the head. Trousseau advised the application to the throat (better the *nucha*) of a sponge dipped in quite hot water. In severe cases mustard plasters (diluted with flour) may be applied to the chest and back. Some advise the momentary inhalation of chloroform. When life is really in great danger from prolongation of the spasm, tracheotomy may be justifiable. Children who have laryngismus are generally anæmic; requiring iron [F. 23] and salt baths.

CROUP.

We understand by croup, an acute cynanche or angina, whose signs are, a hoarse cough—difficult and audible respiration, and aphonia; the seat of the disorder being the upper portion of the air-passages. Its place in nosology has been empirically or conventionally (rather than systematically) established.

The identity of membranous croup with diphtheria, asserted by Dr. J. F. Meigs and others, appears to me to be disproved, by a distinctness of history and pathology too signal to be put out of view by any weight of authority or apparent experience. The one (croup) is a sporadic local inflammation, mostly sthenic; the other (diphtheria) is an epidemic constitutional affection, with local symptoms; mostly asthenic. As Niemeyer¹ points out, also, in croup the exudation is thrown out upon the *epithelial surface* of the mucous membrane, while in diphtheria it forms also *within its substance*. Of other authorities, we find among those holding the doctrine of the identity of membranous croup with diphtheria, Sir Thomas Watson, Hillier, George Johnson, and Morell Mackenzie. On the other hand, the frequent occurrence of cases of inflammatory, pseudo-membranous croup *not* identical with diphtheria, is maintained by Sir W. Jenner, C. West, Hogg, Oppolzer, Niemeyer, and Letzerich, abroad; and G. B. Wood, A. Flint, J. Lewis Smith, and Fordyce Barker, in this country.

¹ Text-book of Practical Medicine (transl.), vol. i. p. 15.

For brevity's sake, the following propositions may be advanced:—

1. The pathological elements of croup are, *a*, spasm; *b*, hyperæmia or congestion; *c*, inflammation, either ordinary or diphtheritic.

The spasm affects especially the muscles whose action tends to close the rima glottidis; but may involve also the muscular coat of the trachea itself.

The hyperæmia commences in the mucous membrane of the larynx or trachea, but often extends throughout the whole anterior cervical region.

The inflammation may be located in a small portion of the same mucous membrane, or, it may extend downwards indefinitely into the bronchial tubes.

2. We may mentally distinguish between cases, in which the croupal dyspnoea results from simple spasm, from simple tumefaction, or from inflammation without any spasmodic constriction of the glottis. But, in practice, the pathognomonic cough and breathing rarely attend such an isolation of one of these conditions. A certain number of cases, however, occur, of purely spasmodic or nervous croup; new and then substituting more general convulsions; as when worms have been, apparently, an exciting cause. A purely inflammatory case is at least equally rare. In fatal pseudo-membranous cases, autopsy examination has repeatedly shown that the amount of false membrane was by no means sufficient, alone, to have occluded the larynx or trachea; the result being due to the additional *spasmodic contraction*.

Fig. 62.



False membrane
in trachea.

3. The most frequent form of the disease, common night croup, is pathologically characterized by spasm of the glottidean apparatus, with congestion and tumefaction (transient in character), of the laryngo-tracheal mucous membrane.

It is in these respects precisely *analogous* in nature to the asthmatic attack, whose seat is in the smaller air-tubes. There is no strongly marked line of separation between this form and the *catarrhal croup*, or croupal catarrh, in which more or less active inflammation occurs, prolonging the existence of the symptoms.

It is in these respects precisely *analogous* in nature to the asthmatic attack, whose seat is in the smaller air-tubes. There is no strongly marked line of separation between this form and the *catarrhal croup*, or croupal catarrh, in which more or less active inflammation occurs, prolonging the existence of the symptoms.

4. Looking, then, on the hyperæmic state as simply intermediate, we may classify the cases of croup, as they ordinarily occur, clinically, as, 1st, those in which spasm predominates; and 2dly, those in which inflammation is the dominant condition; or, bearing in mind the above expressed qualification, into spasmodic and inflammatory cases.

5. Pseudo-membranous, or "true croup," does not generically differ from inflammatory croup; of which it is only a grade or termination: *i. e.*, any case of inflammatory or catarrhal croup

may end in the exudation of coagulable lymph within the air-tubes.

6. Whether this shall occur or not, in any given case, depends, *a*, on the degree of the inflammation; *b*, on the state of the blood of the patient; *c*, on the treatment.

7. It cannot be predicated on the ground of experience, that either vigorous and plethoric, or feeble and anæmic children, are especially prone to the membranous form or termination of inflammatory croup. It may and does occur frequently in both.

8. The ordinarily recognized signs for the diagnosis of inflammatory from non-inflammatory croup are sufficient, *viz.*, the persistent duration of the croupal cough and voice—the (generally) slow onset—the febrile symptoms—and the *stridulous* inspiration, as the dyspnoea increases.

9. Inflammatory or true croup is, with the above inclusion (as always potentially membranous), not at all necessarily fatal, although highly dangerous. The presence of the false membrane itself does not inevitably determine a fatal result. Heart-clot, from embarrassment of the circulation, has sometimes hastened death.¹

10. In no disease does more depend on *early treatment*, which is often prevented by the insidious approach of the attack deluding the parents. The mortality of the disease may thus in part be accounted for.

11. In the treatment of all forms of croup, *relaxation* and *secretion* are the two great desiderata.

12. In the spasmodic cases, emetics and antispasmodics (*e. g.*, ipecacuanha, onion, assafetida, or lobelia) will effect these objects, especially if aided by the warm bath or foot bath.

13. In mild inflammatory cases, saline purging, gentle vomiting, and the use of demulcents, counter-irritation, and pediluvia will relieve.

14. In the more active cases, the loss of blood by the lancet, or by leeching, or by both, will be necessary, and should be early used.²

15. The most satisfactory emetic for employment in such cases is a combination of ipecac and alum [F. 24]; the latter being used in half teaspoonful doses in urgent cases, until emesis is produced. Nor should the practitioner hesitate to compel repeated vomiting at intervals, in desperate cases. Better for a child to risk being sick for a month, than to die of cynanche (dog-choke, as the Greeks termed it). But the alum is unlikely to do harm. Turpeth mineral is preferred by some.

16. Tartar emetic should not be used as an emetic in croup; in sedative or expectorant doses, it may be advantageous.

17. Calomel [F. 25], freely administered, that is, a grain every hour or two, has the highest authority in its favor, in serious croup.

18. Nitrate of potassium has both experience and reason in its

¹ B. W. Richardson, *Med. Times and Gazette*, March, 1856.

² Dr. F. Barker employs, instead, *tinct. veratr. virid.* in one or two drop doses; sometimes combined with carbonate of ammonium, and followed by larger doses of quinine in severe cases.—*Am. Journal of Obstetrics*, May, 1870.

favor. Being a solvent of fibrin, it may tend to prevent the excessive coagulability of the exudation. According to late theories, ammonia might do the same thing; but the clinical or therapeutic antecedents of ammonia point otherwise. Of the lately asserted value of sulphur in croup, I have no experience. Dr. Ozanam reports great success with *bromine* solution (one drop in an ounce of water), a few drops every hour; using also the bromine water and bromide of potassium by inhalation with boiling water.

19. The great evil in membranous croup is the solidifying tendency of the exudation; why should not, therefore, an abundant imbibition of fluids, even of water, do something towards counteracting this? Inhalation of steam, from hot water poured upon unslaked lime, is eulogized by several recent writers. Glycerin, in teaspoonful or half teaspoonful doses, is recommended by E. Hartshorne and others. Lactic acid, found by Bricheteau to be a powerful solvent of false membranes, has been applied locally, in solution, with success, by Dr. Dureau.¹

20. No clear indication exists for the use of opium in the majority of cases of inflammatory or membranous croup; although it may become useful, in cases which are protracted, or which are attended by a more than usual disposition to spasmodic symptoms. The objection to it, in my mind, is, its tendency to diminish bronchial (or tracheal) secretion; which, in croupal affections, we desire especially to promote.

21. Blisters are decidedly useful; but they should not be left on long in croup, a superficial vesication only being desired. With Trousseau, a favorite application was a sponge or compress dipped in hot water and applied to the throat.

22. The application of a strong solution of nitrate of silver [F. 26] to the fauces (and larynx, if possible), does good in many cases; in the pre-exudative stage as a medicament; in the exudative, as a mechanical operation aiding to dislodge the membrane.

23. Iodide of potassium is too slow in its systemic action to be relied on; and the same may be anticipated of the bromide; although nothing should forbid their fair trial.

24. Tracheotomy or laryngotomy will, when performed early, succeed in a fair number of cases; but in those very cases it is impossible to know that they (as well as some in which it fails) might not have recovered without it. Few practitioners, therefore, in this country, can demand the operation early; and in the moribund state, the vascular congestion, from asphyxia, about the throat, renders success extremely difficult, sometimes impossible. Upon the whole, therefore, the number of cases in which the operation may be expected to add anything to our hope in croup, are few. In 1859, Bouchut, of Paris, introduced tubage (or catheter-like dilatation of the larynx and trachea) instead of tracheotomy, at the same time publishing some statistics very unfavorable to tracheotomy. The Académie Impériale de Médecine, however, decided adversely to the use of tubage as a substitute for tracheotomy. The possible extension of false membrane into the bronchial tubes is an objection to tracheotomy as well as to tubage in croup.

¹ Bulletin Général de Thérapeutique, Sept. 15, 1868.

My own experience with tracheotomy has not been encouraging. I cannot, however, justify its abandonment as an absolute principle. With Dr. C. West, who has had but one recovery in sixteen cases, I am obliged to admit its success, in some otherwise hopeless instances; especially in France, where Trousseau and others operate earlier than in England or here.¹ It is most generally fatal in children under three years of age. Where there is reason to suppose the membrane to extend into the bronchial tubes, it is of course in vain. The danger of hemorrhage, from dilated bloodvessels especially, is least if the operation be early. Dr. Aitken thinks that it ought always to be performed if no symptoms of amelioration follow active treatment, by "bleeding, emetics, the warm bath, and calomel purgation" steadily pursued for twelve or sixteen hours. The suggestion is a good one, that the operation is most appropriate *when the tendency to death is more by continuous apnoea than by exhaustion.*² If delayed too long, the apnoea itself may produce an irremediable condition.

If performed, it should be deliberate, tying every vessel that bleeds, making a considerable opening in the trachea, and inserting a tube or canula³ of good size. Some operators excise a small portion of one or two tracheal rings. Others, instead of a canula, use a leaden wire passed around the neck, its ends being hooked into the sides of the opening. In the adult, Arnott and others have used a curved *trocár*. The use of chloroform or ether will facilitate the operation; the danger from the inhalation is least when the vitality of the patient is not yet greatly reduced. Some have observed partial anæsthesia of the skin to be a sign of increasing asphyxia, such as indicates the propriety of the operation. After tracheotomy, the patient should be surrounded constantly with a warm, moist atmosphere. The canula should be withdrawn in as few days as possible, upon the return of permeability of the larynx. The wound may then be treated with ordinary mild dressings, to exclude the air and heal it up. Verneuil, Saint Germain, Ransé, and Muron have advocated tracheotomy with the *actual cantery*. Its especial advantage is said by them to be the

¹ Nélaton's first operation was successful; he then had twenty-three cases without one success. N. Y. Med. Record, June, 1869. From statistics published by Jacobi (Am. Journal of Obstetrics, May, 1868) and others, it appears that of 1021 operations of tracheotomy, in Europe and this country, 220, or 21.48 per cent., have been followed by recovery. During the years 1861-1872 inclusive, there were performed in the department of Prof. Wilms, in Berlin, 330 tracheotomies on diphtheritic patients under 16 years of age. Up to 2 years of age there were 6 operations, and all died. In the ages of 2-3 years, there were 56 operations, 15 recovered; 3-4 years, 69, 22 recovered; 4-5 years, 74, 18 recovered; 5-6 years, 57, 20 recovered; 6-7 years, 33, 15 recovered; 7-8 years, 21, 5 recovered; 8-14 years, 19, 8 recovered; total, 103 recoveries (31½ per cent.)—boys, 36½ per cent., girls, 24½ per cent. In the first two years, and between the ages 11-14 inclusive (of each 6), not a case recovered.

² Dr. G. Buchanan, Brit. Med. Journal, March 4, 1871.
³ F. Howard Marsh (Reports St. Barthol. Hosp., vol. iii.) asserts, after careful measurements, that the diameter of the trachea is, before two years of age, 10-40ths of an inch; in the third year, 11-40ths; between this and the seventh year, 14-40ths. A canula may be 9-40th of an inch for a child under four years; 11-40ths between five and eight, and 12-40ths from that to twelve years of age. Durham's canula is probably the best now in use. Luer's silver canula, movable on the shield, is preferred by some; others use Leiter's *hard-rubber* canula.

division of the *tissues exterior to the trachea*, by means of a knife at a dull red heat, without the danger and delay of hemorrhage. They sometimes divide the trachea itself with a common bistoury; separating the edges of the wound with a dilator to insert the canula.

Lately, the fact that lime will dissolve false membranes has been applied to the treatment of croup; by making the patient breathe the steam from boiling water poured over unslaked lime. Although the lime is not volatile, some of its minute particles will be raised mechanically by agitation. Several successful cases of its use are reported. I should think the practice worthy of further trial. Probably the absorption of the carbonic acid of the breath may partly explain the usefulness of lime. Kuhn, however asserts that *carbonate of potassium*, given early, will prevent the formation of false membrane. Lactic acid (inhalation of a solution of 20 drops in half an ounce of water) has been used with success (Adolph Weber) in croup.¹

To sum up, I would begin the treatment of a case of inflammatory croup with a saline purgative. Then an emetic of ipecacuanha; which may have to be repeated. Leeching, and even venesection, will be useful in a robust subject if seen early. Between the times of emesis, there may be prescribed 1 grain of calomel with 5 grains of nitrate of potassium, every two hours; in urgent cases every hour. In children over three years of age $\frac{1}{2}$ to $\frac{1}{6}$ grain tartar emetic may be added. The warm bath, prolonged, may be used once or twice daily. Hot compresses, or cloths wrung out of cold water (which soon becomes warm when applied) may be applied to the throat; but a blister should follow in a severe case. Inhalation of steam from lime or lactic acid should be tried, early as well as late. Alum must be added to ipecac, if relief be delayed. Nitrate of silver sponging, and tracheotomy, are the last resorts.

The diagnosis between inflammatory croup and *diphtheria* will be referred to hereafter, in connection with the latter disease.

PLEURODYNIA.

Synonym.—*Intercostal Rheumatism.*

Symptoms.—Pain, generally rather dull, sometimes quite severe, of one or both sides, oftenest on the left. It is increased by deep breathing or coughing, moving the arms or trunk.

Diagnosis.—From pleurisy, it is known by the absence of fever, and of all modifications of the sounds heard upon percussion and auscultation.

Treatment.—A large mustard plaster over the part; friction with soap or volatile liniment; dry or cut cups; covering the side with carded wool and oiled silk; a belladonna plaster; a blister if obstinate as well as severe.

INTERCOSTAL NEURALGIA.

Symptoms.—Severe lacerating pains between the sixth and ninth or tenth ribs, along the intercostal spaces; frequently inter-

¹ Med. Times and Gazette, Jan. 22, 1870.

mitting, or even regularly periodical. This affection is most generally met with in anæmic patients, or in those who have been exposed to malarial influence. Occasionally the paroxysms are attended by a sort of reflex pulmonary congestion, simulating pleuro-pneumonia.

Treatment.—A sinapism may be applied; or ointment of aconite [F. 27], or of chloroform [F. 28], or ointment of veratria [F. 29], may be rubbed upon the side during the paroxysm. Should these not relieve, a moderate or small blister may be allowed to vesicate, and then one or two grains of acetate of morphia diluted with powder of gum arabic may be applied to the surface; or solution of morphia may be used by *hypodermic injection*, half a drachm at a time being introduced by means of a syringe adapted to the purpose, over the part.

General treatment, by iron, quinia, or cinchonia, etc., will be determined by the condition of the patient.

THORACIC MYALGIA.

This term has been applied (Inman) to an affection characterized by pain in the superficial muscles of the chest, mostly dependent upon ill-nourishment and overwork; sometimes produced by constrained positions of the body, or pressure; as by a desk, or a soldier's belt, etc.

Its treatment consists in the removal, if possible, of its cause; with local warming or anodyne applications, and general invigoration of the system.

PHTHISIS PULMONALIS.

Definition.—Tuberculous or caseous consumption of the lungs.

Varieties.—Acute, chronic, and latent phthisis.

Symptoms and Course.—Consumption may begin after a severe acute bronchitis or broncho-pneumonia; or, more gradually, with an apparently slight hacking cough; or with a hemorrhage; or with dyspepsia and general debility; or with chronic laryngitis. Increasing, in most cases slowly, the pectoral and constitutional disorder becomes developed. We have, then, pains in the chest, frequent and severe cough, hemorrhage occasionally (in about two-thirds of the cases) and pallor, acceleration of the pulse and elevation of the temperature, with the paroxysms of hectic fever, *i. e.*, chills followed by fever with bright flush of cheek, but without headache; emaciation, arrest of menstruation in the female, night-sweats, colliquative diarrhoea; finally, often, though not always, delirium; and death, mostly by exhaustion, but sometimes by suffocation. The spirits of the patient are apt to be cheerful, even hopeful of life almost to the last. Appetite is variable, digestion usually not vigorous; but to this there are exceptions.

The following description of advanced phthisis is from the late Prof. N. Chapman:—

“The cheeks are hollow, the bones prominent, the skin arid, the nose sharpened and drawn, the eyes sunken, with the adnata of a pearl color, destitute of vascularity, the lips retracted, so as to produce a bitter smile, and the hair thinned by falling out, the

neck wasted, oblique, and somewhat rigid or immovable, the shoulder-blades projected or winged, the ribs naked or exposed, with diminution of the intercostal spaces, and the thorax apparently narrowed; the abdomen flat, the joints, great and small, seemingly enlarged from the wasting of the integuments, the nails livid and occasionally incurvated, the extremities œdematous; the angular points on which the body rests, in several points protruded through the skin—the whole attended by a most afflicting cough, aphthæ, sore throat, difficult deglutition, and feeble, whispering voice, or entire extinction of it.”

The expectoration in phthisis is at first mucous or bloody; later, muco-purulent and bloody, or else *nummular*; *i. e.*, in roundish masses like coins, not floating perfectly in water; or, abundant and purulent. Dr. T. Thompson first noticed (1852) the appearance of a rather deep-red line along the gums as one of the signs of phthisis.

Stages.—These are, 1. Incipient phthisis; 2. The stage of consolidation of the lung; 3. That of excavation or *vomicæ*; 4. Advanced or confirmed consumption.

Physical Signs.—The earliest indications upon physical exploration are, a sinking in under the clavicle upon the left side, with prolonged expiratory sound. Not long after, the evidence of consolidation is, increased dullness over the apex of the lung upon percussion (not invariably, but *generally* upon the left side) with blowing or bronchial respiration, or interrupted jerking respiratory murmur, and increased vocal resonance and vibration. Dry crackling follows, with mucous or coarse crepitant r le.

When softening of tubercular deposits occurs, moist crackling and gurgling become very distinctive signs. The presence of a *vomicæ* is shown by cavernous respiration and bronchophony or pectoriloquy. Percussion-resonance over a cavity will be dull if its walls be thick, and amphoric if they are thin and tense; if thin and relaxed, the *bruit de pot f l * or cracked pot sound. On percussion over a cavity when the patient's mouth is shut, the sound produced will be of a lower pitch than when the mouth is open.

Pneumothorax and hydro-pneumothorax, *i. e.*, dilatation of the pleural cavity and compression of the lung by air, or air and liquid together, with perforation of the lung, are not uncommon results of tubercularization, although possible without it. Of pneumothorax, the percussion-resonance is tympanic; respiratory murmur is lost. Hydro-pneumothorax may give tympanic resonance above, with metallic tinkling on auscultation, and dullness below.

Physical and Microscopical Peculiarities.—Temperature has of late been found to be a diagnostic aid in phthisis. It is asserted that there is a *continued elevation of the heat of the body* in all cases in which tubercle is being deposited; that this may occur for weeks before any local physical sign is discoverable; and that the rise in the heat of the body varies, during the progress of the case, with the greater or less activity of the tubercularization. It has been shown, however, that exceptions to this general rule do occur; and it is not certain whether the elevation of temperature is not

due really to a concomitant irritative or sub-inflammatory process, rather than to the simple deposit of tubercle. This last is, indeed, the most probable view.

When expectoration is copious, some micrologists aver that diagnosis may be aided by its minute characters; arched and anastomosing fragments¹ of pulmonary fibrous tissue, and tubercular corpuscles, being discerned. But it is not certain that the former are thrown off only in phthisis; and the latter may be absent or obscure in character in an otherwise clear case. Niemeyer regarded the presence of elastic fibres in the sputa as a sure indication of consumption. Dr. Fenwick, of London, detects minute portions of lung-tissue by boiling the expectoration a few minutes with its bulk of solution of caustic soda (gr. xv in f zj of distilled water), and adding cold water, in a conical vessel. The sediment is then examined with the microscope.

Terminations.—The cicatrization of *vomicæ*, and the cessation of tubercular deposition, have, although exceptional, been often found to occur; and so have the cornification and calcification of unsoftened tubercle. Recovery from phthisis may in such cases be expected to take place, as the arrest of the local disease attends the presence of a favorable constitutional state.

Death from consumption may come by *asthenia* or by *apnœa*. The first is most common. Suffocation or apnœa may follow—1, from hemorrhage; 2, rupture of a large *vomicæ*; 3, pulmonary œdema or hydrothorax; 4, excessive secretion or bronchorrhœa, beyond the power of expectoration.

Complications.—Pleurisy is a frequent concomitant of phthisis. Tubercular peritonitis is much more rare. On account of its duration, however, this disease may be accidentally combined with various affections not specially kindred with it. Asthma is particularly *not* apt to be conjoined with phthisis.

Diagnosis.—It is from chronic bronchitis, cancer of the lung, pleuritic effusion, bronchial dilatation, and pulmonary abscess that phthisis requires the most care for discrimination.

Chronic bronchitis is not common except in old persons; its expectoration is thinner, whiter, and not nummular nor bloody; there is no hectic, although there may be emaciation; and there are none of the physical signs of phthisis.

Cancer of the lung exhibits a marked dullness of resonance on percussion on one side, with blowing respiration, unless a bronchial tube be obstructed, when there is no respiratory sound. There is severe and almost constant pain in the chest. The peculiar auscultatory signs of tubercular disease are absent; and the sallow, cachectic aspect of cancer, and the concurrent existence of carcinomatous tumors somewhere in the body, generally make the case clear.

In “chronic pleurisy,” as pleuritic effusion is often called, the dullness on percussion is at the *lower* part of the chest; the side is expanded, unless after the fluid is absorbed; respiratory murmur and vocal vibration are suppressed; and the general symptoms, as irritative fever and wasting, are not so extreme.

¹ Dr. J. G. Richardson calls attention to the *square fracture* of these fragments as being distinctive.

Bronchial globular dilatation may give auscultatory signs exactly like those of a tubercular cavity; but there is no hæmoptysis, nor emaciation, nor much loss of health. The expectoration may be more copious than in consumption; but the matter is more liquid, and pus is much more diffused in it. The cough is more constant than in phthisis.

Abscess of the lung is to be distinguished from phthisis by its history, generally following recognized pneumonia; its seat mostly at the base of the lung; its physical signs decreasing instead of increasing; and, as with cancer, the affection being confined altogether to *one lung*. The extension of the signs to both lungs is important in most cases in the diagnosis of phthisis.

Dr. Walshe states that *caseous infiltration* is more likely to occur either at the base, or in the middle portion of the lung than is the case with *tuberculation*.¹

Syphilitic disorder sometimes affects the lungs and bronchial tubes, with a condition almost undistinguishable from ordinary consumption. The previous existence of venereal disease, and periosteal nodes upon the clavicles, with the slower progress of the decline, will help to enlighten us.

Prognosis.—Phthisis is certainly one of the most destructive of diseases. In no case can recovery be anticipated; but it does occur, as every physician must have witnessed. I have seen a number of such recoveries; generally from the incipient stage, but even where vomica, emaciation, and night-sweats had occurred. Dr. A. Flint has recorded the history of sixty-two cases of restoration from consumption. Cruveilhier said of phthisis, long ago, "Prevent inflammation, and you will cure your patient." Hérard and Cornil have lately asserted nearly the same opinion.

Under improved hygiene and medical treatment, the mortality from phthisis appears to be declining. Without referring to statistics (the nomenclature connected with which in past times would be a source of doubt, as chronic bronchitis, etc., were once called consumption), I am convinced that fewer people die of phthisis now than twenty-five years ago, in Philadelphia.

The *duration* of phthisis varies greatly, being least, as a general rule, in the youngest subjects. Eighteen months to two years is the most frequent period. But in some instances life is prolonged under it for twenty, thirty, or even forty years.

Dr. C. T. Williams² found the average duration of 198 cases, under favorable circumstances for treatment, over seven years; and of 802 still living, the average continuance of the disease was more than eight years. It is probable that, in cases not cured, the hygienic and therapeutic measures now employed increase the length of life much beyond what was possible thirty or forty years ago.

In the United States, however, the deaths from phthisis still constitute 25 per cent. of the whole mortality from all diseases.

Acute phthisis, or galloping consumption, may end life in from six weeks to three months. This sometimes follows pneumonia.

¹ Treatise on Diseases of the Lungs, 4th edition, 1871.

² Lancet, Jan. 21, 1871.

Its symptoms differ from those of ordinary consumption chiefly in their rate of progress. Softening of the tubercle and the formation of cavities do not always occur to any extent, apnea being caused by extensive diffusion or infiltration of the tuberculous or caseous deposit through the lungs.

In any case of consumption, the *state of the general system* is of primary import in prognosis. When the patient is gaining in weight and strength, and fever and night-sweats diminish or disappear, there is hope, for a time at least. Spitting of blood (when consumption is proved to exist already) does not increase the unfavorable aspect of the case. Rapid emaciation, chills, hectic, swelling of the feet, and diarrhoea are always discouraging; as, of course, are, also, all signs of increase in the local pulmonic affection.

Causation.—Hereditary taint of constitution¹ is general; independent origination of phthisis the exception. From 18 to 35 years is the time of life most subject to it; but it is now and then met with even in children, and frequently in the aged. Statistics in Europe and in this country show some proportion between the mortality from consumption and nearness to the sea-level; the lowest lands having the greatest total amount of it. High, dry, and equable climates and situations, even though cold, are most exempt from it. It is not a disease of the Arctic regions, and there is more of it in Tennessee than in Illinois.

The views of Oppolzer, Niemeyer, Virchow, and others, concerning the frequent origination of consumption in "caseous pneumonia" or broncho-pneumonia, or bronchitis, and the declaration that tubercle is absent in a large number of cases, even of fatal consumption, are now undergoing, as they deserve, critical examination by the profession. I believe it to be too soon to accept so great a modification of pathological doctrine as they involve; although the *occasional* occurrence of serofulous phthisis without characteristic tubercular deposits may be (as indeed it has long been) admitted. If we accept the opinion of many pathologists, recent as well as older, that caseous softening is the *customary change* (Virchow, Waldenburg) which true miliary tubercle undergoes, it would seem quite supposable that the absence of true (so-called) tubercle in a number of cases in the lungs of those who have died of phthisis may be explained by the process of softening and transformation having had time to be *completed*.

Among the predisposing causes of consumption is congenital stenosis (contraction) of the pulmonary artery (Farre, Gregory, Louis, Traube, Frerichs, Lebert).

Dr. A. Flint,² analyzing 670 cases of phthisis in private and hospital practice, concludes, as follows: "Pneumonia and bronchitis have very little if any causative influence in developing this disease; and there is no clinical evidence of hæmoptysis having such an influence. Nor is there evidence to sustain the hypothesis which attributes miliary tuberculosis to absorption of morbid pro-

¹ Even those who advocate the new views of the nature of consumption admit a "vulnerability" which is inherited.

² New York Medical Record, 1873.