

**On cough: its causes, varieties, and treatment : with some practical remarks on the use of the stethoscope as an aid to diagnosis / by Robert Hunter Semple.**

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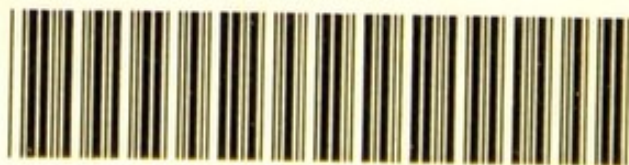


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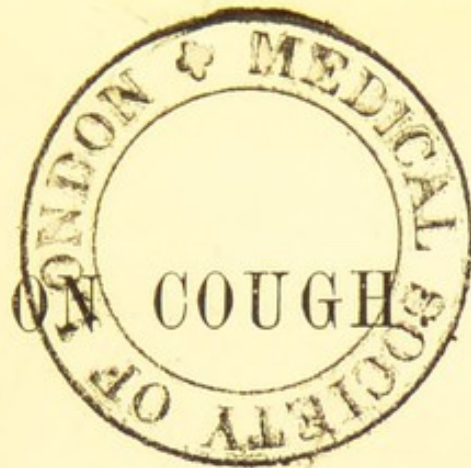
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ITS CAUSES, VARIETIES, AND TREATMENT.

WITH

SOME PRACTICAL REMARKS ON THE USE OF THE  
STETHOSCOPE AS AN AID TO DIAGNOSIS.

BY

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## PREFACE.

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HAVING devoted considerable attention to the Diseases of the Respiratory Organs, I have thought that a work upon the various pathological causes which give rise to the action of Coughing, and upon the treatment suitable to each case, would not be unacceptable to the Profession.

I need scarcely assert that nothing is further from my object than to propose any panacea for this troublesome affection. On the contrary, I have shown that its causes are numerous and varied, and that its treatment must often be founded upon the most opposite principles.

Believing that Anatomy, Physiology, and Pathology are the bases of legitimate medicine, I have divided the book into three principal sections. In the first, the Anatomy of the parts concerned in Cough is briefly described; in the second, the Physiology of that affection is explained; and in the third, the Pathological condition of the organs and tissues in those diseases which are characterised by Cough, is successively detailed, and the treatment of each case is deduced from the morbid manifestations which give rise to it.

The results of Auscultation and Percussion having thrown a flood of light upon the nature of those thoracic diseases which are necessarily included in the plan of my work, I have thought it necessary to introduce some practical remarks upon the aid afforded by these methods of diagnosis; and it must be understood, that (although



I have availed myself, to the utmost of my power, of the written and oral precepts of modern physicians) the remarks I have made have been verified or corrected by my own experience, gained first in the London schools of medicine, then in the wards of the Hospital of La Charité in Paris, and afterwards in a tolerably extensive public and private practice.

I have laid down for myself the rules which I would prescribe to my younger professional brethren, viz. to study diligently the works of the best medical writers, but to study still more diligently the great book of Nature : to explore with all possible accuracy the symptoms of disease ; and to learn, by the lessons of experience, the best way of treating it. Above all, I would recommend the adoption of the plan I have always followed, of comparing the physical phenomena of disease, and its diagnosis, during life, with the appearances observed after death. By the constant habit of instituting this comparison, the condition of internal organs becomes almost as perceptible to the mental vision, as the appearance of external objects is to the corporeal ; and the practice of medicine is no longer a struggle in the dark with unseen foes, but an open encounter with well-known antagonists.

The following pages, therefore, must be considered not as a mere compilation from the works of others, although I cheerfully acknowledge the assistance I have derived from medical reading ; but a record of my own experience, as far as it has gone, and an expression of my own opinions upon the subjects introduced.

8, TORRINGTON SQUARE, LONDON.



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## ANATOMY OF THE PARTS CONCERNED IN COUGH.

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THE parts of the human body which are chiefly concerned with the act of coughing are the tonsils and uvula, the larynx, the trachea, the bronchial tubes, the lungs, the heart, the stomach, the diaphragm, and the other respiratory muscles: to which may be added, certain special portions of the nervous system, as will be hereafter explained.

THE TONSILS (*amygdalæ*) are two bodies, each having somewhat of the shape of an almond, one lying on each side of the back part of the mouth, about six lines in length, but not presenting a very prominent appearance in the healthy state. When enlarged, however, the tonsils attain a very great magnitude, sometimes closing up the entrance to the throat. There are a number of small openings on the surface of the tonsil, leading into cavities in its interior, and the use of these cavities and openings is to prepare and pour forth a mucous fluid, with which the fauces are moistened. The tonsils are abundantly supplied with blood from

branches of the facial artery, as well as from the descending palatine, the ascending pharyngeal, and the lingual artery. The nerves of the tonsils are derived from the *Glosso-pharyngeal*, which at its exit from the skull is in intimate relationship by nervous intercommunication with the *Pneumogastric Nerve*; a very important connexion, as will hereafter be seen.

THE UVULA is a small rounded or conical body which hangs down over the throat, and is connected on each side with the soft palate, of which it is in fact a part. The Uvula has a pair of small muscles attached to it, called the *azygos uvulae*, one on each side of the middle line: and it is by the contraction of these muscles that the uvula is elevated.

The Tonsils and Uvula are both covered on their external surface by mucous membrane, which is continuous from the lips and tongue, the nostrils, the back part of the throat, and downwards to the lungs and the alimentary canal. This continuity of the mucous membrane has an important bearing upon the pathology of the structures now under consideration.

The Tonsils and Uvula have very little common sensation under ordinary circumstances, but it is probable that the branches of the glosso-pharyngeal nerve, which are spread over them, may enable them to contribute to the sense of taste. When in a state of inflammation, however, as in a common sore throat, the tonsils become very painful. The enlargement of the tonsils does not occasion pain, and the patient suffering from this affec-



tion is often unconscious of the fact; and the operation of cutting off a portion of the tonsils may be effected without pain, as may also the operation of cutting off a portion of the uvula.

THE LARYNX is a hollow organ, placed between the tongue above and the windpipe below, forming a visible prominence in the neck of the male, and composed of cartilages, ligaments, muscles, vessels, nerves, and mucous membrane. It is through the larynx that the air enters the lungs, and it is in this organ that the voice is produced, to be subsequently modified into articulate sounds by the structures of the mouth.

The chief cartilage of the larynx, and that which gives to it its characteristic appearance, is the *Thyroid*, which consists of two lateral halves united together in front at an angle, acute in the adult male, but obtuse in the female and the child. Each lateral half of the thyroid cartilage is somewhat quadrilateral in shape. It is the thyroid cartilage which forms the well-known prominence in the man's neck, and which has been called *pomum Adami*, from a foolish notion that the apple given by Eve to Adam remained fixed in the throat of the latter. Beneath the thyroid cartilage is another cartilage, circular in form, called the *cricoid*, from *κρίκος* or *κίρκος*, a circle; and which, unlike the thyroid cartilage, forms a complete ring. Surmounting the posterior and upper border of the cricoid cartilage are two other little cartilages, of a triangular form, called the *arytænoid cartilages*, so called from *ἀρταλβα*, a pitcher,



from the fancied resemblance which these parts present, when combined together, to the spout of a pitcher.

Looking at the larynx from above downwards, it will be observed that the cavity of the larynx is, under certain circumstances, completely closed by a kind of flap, which springs from the back of the tongue. This is a fibro-cartilage, called the *Epiglottis*, which, although completely closing the cavity of the larynx when that organ is drawn up under the tongue, allows at all other times a free passage of air to the windpipe and lungs. Its elasticity enables it to open or to close the air tube, and it was at one time supposed that its office was to prevent the food from passing into the windpipe during the act of deglutition; but some observations, showing that this object could be accomplished almost equally well when the epiglottis was absent or diseased, have caused the abandonment of this idea. There can be no doubt, however, that the epiglottis materially contributes to obviate the inconvenience alluded to.

Still looking from above downwards, but turning away the epiglottis, the cavity of the larynx comes into view; and stretched across the cavity from before backwards, and leaving a longitudinal fissure between them, are seen two ligaments, called the *Thyro-arytænoid Ligaments*, which are structures of great importance in the formation of vocal sounds, and which are therefore also called the *Vocal Chords*. The space between the epiglottis and the vocal chords is called the *Glottis*, and the fissure between the vocal chords is called the



*Rima Glottidis*, or chink of the glottis, and it is through this fissure that the air passes into the windpipe and the lungs.

Besides the thyro-arytænoid ligaments, there are other ligaments uniting together the thyroid cartilage to the hyoid bone, the thyroid to the cricoid cartilage, &c.; but these are not immediately related to the pathological conditions of the larynx, and are, therefore, not particularly described.

The muscles of the larynx are very important, as they have the power of opening or closing its cavity. They are eight in number—namely, the crico-thyroid, crico-arytænoideus posticus, crico-arytænoideus lateralis, thyro-arytænoideus, arytænoideus, thyro-epiglottideus, arytæno-epiglottideus superior, and arytæno-epiglottideus inferior.

Without entering at length into the various opinions which have been entertained with regard to the special use of these muscles, which discussion would be foreign to the object of the present work, I may remark that, according to the views of my friend Mr. Bishop, who has paid great attention to the anatomy, physiology, and pathology of the vocal organs, the crico-arytænoidei postici are the muscles which open the cavity of the glottis, while all the other muscles close it.

The larynx is abundantly supplied with blood, two large branches, coming respectively from the external carotid and the subclavian artery, being distributed upon and within it, and to the adjacent textures.



The Nerves of the Larynx, which are supplied from two sources, are distributed both to the muscles and to the mucous membrane; and are, therefore, nerves both of sensation and motion. The nerves are the *superior and inferior (or recurrent) laryngeal nerves*, and they both arise from the pneumogastric nerve, which, as will be shown hereafter, exercises a most important influence upon the functions of respiration and digestion. Without entering minutely into the distribution of these nerves, it may be stated generally that the superior laryngeal nerve is distributed to the mucous membrane and to the crico-thyroid muscle, and is therefore a mixed nerve of sensation and motion; while the recurrent laryngeal nerve is distributed to all the muscles, except the crico-thyroid, and is therefore a nerve of motion.

The TRACHEA, or WINDPIPE, is a hollow tube, which connects the larynx with the lungs. It is placed in front of the throat, and has the œsophagus behind it. It is attached above to the larynx, and below it divides into two branches, called the *bronchial tubes*, which enter into the lungs. It consists of a strong, fibrous membrane, and of a series of imperfect rings of cartilage, from sixteen to twenty in number; it contains also elastic tissue and muscular fibres; is well supplied with vessels and nerves; and is lined by mucous membrane. The cartilaginous rings, of which the windpipe in great part consists, are imperfect behind, where it is in apposition with the œsophagus. By this arrangement, the distension of the œsophagus by food, in its passage to



the stomach, is freely permitted ; which would not be the case if the trachea were a perfectly cylindrical, rigid tube. But the tracheal rings have, moreover, a morphological signification, as they are, in fact, the anterior arches of undeveloped cervical ribs, the posterior parts of which are to be found in the anterior halves of the transverse processes of the cervical vertebræ. The mucous membrane of the trachea is continuous with that already described as lining the mouth, nostrils, and back of the throat.

The arteries of the windpipe are derived from the inferior thyroid, a branch of the subclavian, the same source which supplies the larynx.

The nerves of the windpipe are derived from the pneumogastric, and from its recurrent branch ; and also from the sympathetic system.

The BRONCHIAL TUBES are the cylindrical air-vessels into which the windpipe divides. There are two principal tubes, or *Bronchi*, called right and left, which differ from one another in length and other particulars ; but they are both essentially the continuations of the windpipe, and, like it, are composed of fibrous membrane, imperfect cartilaginous rings, muscular fibres, elastic tissue, mucous membrane, together with vessels and nerves. The nerves are supplied from the same source as that which supplies the windpipe, namely, the pneumogastric nerve and the sympathetic system ; but the arteries are derived from the aorta, and are called the *bronchial arteries*. After the two bronchi have

entered the lungs, they each divide and subdivide in the texture of those organs, and their further description will be found in that of the lungs themselves.

The LUNGS are two elastic, spongy organs, which, together with the heart, fill up almost completely the cavity of the chest. Although the dimensions of the lungs vary with each inspiration and expiration, yet the bony walls of the enclosing cavity accommodate themselves to the change by means of the cartilages and muscles with which they are provided, and by which they are rendered elastic.

The structure of the lung consists of the continuation of the bronchial tubes and their mucous membrane; of elastic tissue and common areolar tissue; of an investing membrane, called the pleura; and of vessels, nerves, and absorbents. These constituents of the lung will be considered separately.

The *Bronchial Tubes*, after entering the lung, divide and subdivide in all directions, becoming smaller and smaller in their calibre, as the subdivision proceeds, but never communicating with one another. They terminate at last in small cavities, called *pulmonary cells*. Although considerable doubt existed for a long period as to the exact mode in which the bronchial tubes terminate, the explanation given by Mr. Rainey is now generally adopted—namely, that the bronchial tubes finally resolve themselves into a kind of canals, called *intercellular passages*, in the walls of which the pulmonary cells are clustered together, and into which they



freely communicate, although they do not communicate with one another. These pulmonary cells, which exist in vast multitudes throughout the lung, are of the deepest importance in a physiological and pathological point of view ; and, indeed, the bronchial tubes themselves are merely the channels for conveying the atmospheric air to these cells, where the true functions of respiration are performed. The cells, in fact, are surrounded with minute bloodvessels, and the structure both of the cells and of the circumjacent bloodvessels, is of such extreme tenuity that the aeration of the blood is readily effected through the walls which divide the cells from the vessels. The atmospheric air, drawn by the mouth through the windpipe and bronchial tubes, and reaching the air-cells, parts with its oxygen through the cell-walls, and mixes with the blood ; while the carbonic acid previously contained in the blood, passes, *vice versâ*, from the bloodvessels, and enters the pulmonary cells, to be expired through the bronchial tubes, and the mouth. By this chemical action upon the blood, that fluid is converted from the venous to the arterial state ; and, unless that change be effected, life must cease to exist.

The bronchial tubes, in subdividing throughout the tissue of the lung, resemble very much in their structure that of the windpipe and its two large divisions ; but, whereas the latter are only imperfectly circular, the smaller bronchial tubes are completely so, the cartilages being disposed all round the tubes, and maintaining



them in an open condition. As the diameter of the tubes diminishes, however, the cartilages cease, and they are altogether absent in the intercellular passages.

Besides the cartilages, the bronchial tubes possess a *fibrous coat*, which extends to the smallest ramifications. There is also a *muscular coat*, consisting of pale, unstriped fibres, disposed circularly around the tubes, but disappearing in the intercellular passages. This muscular coat plays a very important part in certain diseases of the lungs—as, for instance, in asthma, which consists, in fact, of a spasmodic affection of the muscular coat of the bronchial tubes. There are, in addition, longitudinal fibres of *yellow elastic tissue*, running along the bronchial tubes throughout their whole extent, and traceable even around the intercellular passages and the cells. This elastic tissue is of great importance to the due performance of the functions of the lung; for its elasticity, although allowing the entrance of atmospheric air, subsequently acts as a compressing force, squeezing out the air, as it were, from the pulmonary structure. In the act of inspiration, the air forcibly distends the bronchial tubes and air-cells; but in expiration the air is merely pressed out mechanically by the elastic tissue.

The *Mucous Membrane*, which lines the bronchial tubes, is of very great importance in its pathological relations, as it is, in fact, the primary seat of that very common and destructive disease, Bronchitis. This mucous membrane is continuous with that which lines the mouth, the nostrils, the back of the throat, the



gullet, the stomach, and intestines; and it is by this extensive continuity that many of the sympathies existing between the stomach and intestines and the lungs are to be explained. The mucous membrane of this, as of other parts, consists of a thin, membranous expansion, called *basement membrane*, on which are placed a number of cells, receiving collectively the name of *epithelium*; and one of the peculiarities of the bronchial mucous membrane is that the epithelial cells are furnished with minute, waving, hair-like processes, called *cilia*, from their general resemblance to the eyelashes in appearance. These cilia are continued throughout the whole of the bronchial tubes, and extend even to the intercellular passages and the air-cells. They perform a most important office, for they act as brushes, sweeping away from the surface of the cells and tubes any offending matters, and moving them outwards towards the wind-pipe for their final expulsion. The mucous membrane, in its healthy condition, secretes a small quantity of transparent, somewhat glairy fluid, called *mucus*, which lubricates the passages over which it is spread; but in morbid conditions, this secretion of mucus is suppressed, or it becomes too abundant, the latter case constituting, in its milder forms, the disease called Catarrh.

As I have now described the structure of the Bronchial tubes and air-cells, the external membrane covering the lungs may next be noticed.

The *Pleura* is the membrane covering the outside of the lung, as the mucous membrane lines its inside.



There are two distinct *pleuræ*—one to each lung ; and each pleura covers not only the lung, but the interior part of the walls of the chest, being reflected from one to the other at certain points, and forming a shut sac. The latter fact, and the perfect separation between one pleura and the other, explain the reason why effusions of fluid in the pleural cavity of one side never communicate with the other side. The pleura is a *serous membrane*, the office of which, in health, is to pour forth a small quantity of fluid called *serum*, which lubricates the surface of the membrane, and enables its opposite surfaces to move freely and easily upon each other. Mucous membranes terminate externally in passages communicating with the atmospheric air ; but serous membranes are nearly all shut sacs, and do not open externally at all. The pleura, in its healthy condition, moves freely and noiselessly over its opposed surfaces ; but, when diseased, the secretion of serum is either suppressed, or it becomes too abundant, or altered in character—in any case constituting a serious morbid condition.

The structures of the lung which intervene between the pleura on the outside and the bronchial tubes in the inside, are the areolar tissue, the bloodvessels, the nerves, and the absorbents ; all these constitute collectively what is called the *parenchyma* of the lung, a name of which it is very difficult to give any definite explanation, and which ought, perhaps, to be discarded from modern science. It is evidently derived from the Greek word,



χέω, to pour, and means, properly, an *infusion* or *pouring in*. The term, substance of the lung, is quite as useful, and more intelligible.

The *areolar tissue*, often called improperly cellular tissue, although it contains no cells, is the soft web of matter which binds together all the other parts, filling up all the interstices, and giving the full, rounded, uniform appearance to the surface of the lung. It consists of a number of white fibres, without elasticity, and interlaced together in all directions. Fluids which pass into one portion of this tissue, find their way to all other parts, as the passages are continuous with each other.

The *Bloodvessels of the Lung* are of very great importance, as they perform essential parts in the maintenance of life. They are, moreover, remarkable for their apparently paradoxical nature and functions, as the pulmonary artery performs in some measure the office of a vein, and the pulmonary veins perform the office of arteries. It should, however, be noticed, that there are two distinct sets of bloodvessels in the lung, one for the nutrition of the pulmonary textures, and the other for the circulation and aëration of the blood. The first are the bronchial arteries and veins, the second are the pulmonary artery and veins.

The *Bronchial arteries*, generally three, arise from the thoracic aorta, and ramify upon the walls of the bronchial tubes; they are the nutritious arteries of the lungs, and they are continuous with the bronchial veins, which

bring back the blood from the lungs, to pour it into the larger venous trunks.

The *Pulmonary Artery* is a large trunk which springs from the right ventricle of the heart, and, dividing into two large branches, pours the venous blood from the right side of the heart into the lungs. The branches of this great vessel divide into smaller and smaller branches in the texture of the lung, and terminate in *capillary vessels*, which are spread around the intercellular passages and the air-cells, already described. It is from this apposition of minute vessels and air-cells, that the blood is rendered fit for the purposes of life—the air-cells giving oxygen to the blood, and the blood sending carbonic acid into the air-cells. By losing carbonic acid and receiving oxygen in exchange, the blood which was venous in the pulmonary artery becomes arterial, and then it passes in the purified form into

The *Pulmonary Veins*. These commence in the capillaries of the lung; and, as has just been observed, they convey the purified and arterialized blood *out* of the lungs, while the pulmonary artery conveys the impure blood *into* those organs. The pulmonary veins are four in number, and they terminate in the left auricle of the heart.

The *Circulation of the Blood* may be thus briefly described. The venous blood is poured into the right auricle of the heart, and thence is conveyed to the right ventricle: from the right ventricle it passes into the pulmonary artery, and is propelled into the lungs; in



those organs it undergoes the change from venous to arterial, by the influence of the air in the pulmonary cells; and, thus purified, it returns by the pulmonary veins to the left auricle of the heart, thence into the left ventricle, and is finally distributed to the system generally by the aorta.

The *Nerves* of the Lung deserve great attention, from their physiological and pathological relations. They are derived from two sources, namely, from the pneumogastric nerve, and from the sympathetic system. Both these sources of nervous influence are beyond the control of the will; but they perform most essential functions in the maintenance of life, and require a brief description in connexion with the history of Cough.

The *Pneumogastric Nerve* takes its origin within the skull from the medulla oblongata or cerebral termination of the spinal cord; it escapes from the skull through the *foramen lacerum* at the base, and appears in the neck. It descends the side of the neck in the same sheath with the carotid artery and the jugular vein, but at the base of the neck, it leaves those vessels and applies itself to the gullet, and descending by the side of that tube, it reaches the stomach, to which it is finally distributed, after having given off branches to the larynx, the wind-pipe, and the lungs. Thus it will be perceived that the lungs and the stomach are both supplied by this nerve, whence the name *pneumogastric*, πνεῦμα, the lung, and γαστήρ, the stomach. Hence a most important relation is established between those organs by means of this



nerve : and it may thus readily be understood why derangements of the stomach may give rise to embarrassments of the lungs, and on the other hand, why diseases of the lungs will induce derangement of the stomach. On the same principle the effect of certain remedies may be explained, as, for instance, the efficacy of expectorants and emetics in pulmonary affections ; and indeed the whole series of medicines which act upon the lungs, exercise their influence upon those organs only through the medium of the stomach, and by the assistance of the pneumogastric nerve.

But this description of the pneumogastric nerve would be imperfect without noticing, in more detail, the branches which it gives to different organs, and the important connexions which it forms with other nerves.

Immediately after its exit from the skull, the pneumogastric nerve sends branches of communication to join the spinal accessory nerve, the glosso-pharyngeal nerve (see p. 2) and the first ganglion of the sympathetic, and lower down there are communicating branches to the hypoglossal nerve, which gives the power of motion to the tongue. The nature of these communications should be carefully kept in view by the medical practitioner, as many pathological phenomena are explained by reference to these connexions, as will hereafter be shown. Besides these communicating branches, the pneumogastric nerve sends branches to important organs placed along its course. It first sends an *auricular branch* which pierces



the temporal bone, and is finally distributed to the integument behind the ear ; a *pharyngeal branch*, which, in connexion with branches from the sympathetic, the superior laryngeal, and the glosso-pharyngeal nerves, form a *plexus* behind the back part of the throat ; a *superior laryngeal branch*, which descends to the larynx, and is distributed to the mucous membrane of that organ and to one of its muscles (the crico-thyroid) ; *the cardiac branches*, which, together with filaments from the sympathetic, are distributed to the heart ; an *inferior laryngeal branch*, called *recurrent*, because it *runs upwards*, which enters the larynx, and is distributed to all the muscles of that organ, except the crico-thyroid, which muscle, as has just been shown, is supplied by the superior laryngeal nerve ; two sets of *pulmonary branches*, anterior and posterior, which reach the root of the lung, and are there associated with branches of the sympathetic nerves ; *œsophageal branches*, which form a plexus, or nervous net round the gullet ; and *gastric branches*, which are given to the stomach. It is impossible to over-estimate the importance of a thorough knowledge of these nervous threads and interlacements, for a due comprehension of the causes and treatment of cough.

The SYMPATHETIC SYSTEM OF NERVES, which plays a hitherto mysterious, but probably very important part in the phenomena of organic life, can be merely glanced at in describing the anatomy and physiology of the parts concerned in cough. It consists of a number of nervous threads, of great tenuity, connecting together certain



nervous masses, of an irregular shape, called *ganglia*. These ganglia, commencing in the eye, the nose, the ear, and other parts about the head, send branches which communicate with other ganglia in the neck, and these again are connected with a chain of similar ganglia in the chest, and these latter are continuous with more in the abdominal and pelvic regions. By this chain of ganglia and nervous filaments the most distant organs of the human body are brought into relation with each other, and the brain, the heart, the lungs, the stomach, the intestines, the liver, the kidneys, and the womb, are made to *sympathize* with each other's derangements; and from the control or supposed control of this nerve over these sympathies, the name has been applied. It must be confessed that the exact functions of the sympathetic system of nerves are not yet ascertained; and it may be reserved for some future Charles Bell or Marshall Hall, to solve the enigma.

For our present purpose it is sufficient to state that the sympathetic nerve-masses in the neck send *pharyngeal branches* to join the pharyngeal plexus; *laryngeal nerves* to join the superior laryngeal nerve of the pneumogastric; *cardiac nerves*, three in number on each side, and of considerable size, to be distributed to the heart. In the chest, the sympathetic nerves give *pulmonary branches* to the lungs, forming, with branches from the pneumogastric, the pulmonary plexus; and large and important nerves, called *splanchnic*, which are sent down to the viscera of the abdomen. It is necessary to



mention that below the diaphragm, in the abdomen, there is a large nervous interlacement, called the *solar plexus*, which gives out radiating filaments on all sides, to the stomach, the liver, the spleen, and other adjoining parts. This solar plexus is the termination of the splanchnic nerves, and it receives nervous threads from the pneumo-gastric nerves, and from the phrenic nerves, which supply the diaphragm.

The HEART, although one of the most important organs in the human body, will require only a brief description in connexion with the subject of cough. It is a muscular structure, of a somewhat pyramidal form, having its base upwards, and its apex pointing towards the left side. It is placed between the lungs, and it rests upon the tendinous part of the diaphragm. It has four cavities, two called *ventricles*, and two, *auricles*; one ventricle and one auricle being connected with the lungs, and the two other cavities with the arteries and veins of the general system. The right ventricle *pours* the blood into the lungs, and the left ventricle *pours* the blood into the whole body; the right auricle *receives* the blood from the body; the left auricle *receives* the blood from the lungs. The nervous supply of the heart is chiefly derived from the sympathetic system, but the pneumo-gastric nerve contributes some branches. With this intimate connexion in situation and in functions, it cannot be a matter of surprise that the heart and lungs sympathize completely with each other both in health and disease.

THE STOMACH is less concerned in the act of cough-



ing than any other of the organs just described, and, indeed, it has no immediate concern in that act. Still, as will hereafter be shown, owing to the influence of the pneumogastric nerve and the sympathetic system of nerves, the lungs and the stomach are brought into such intimate relation with each other, that the derangements of the stomach often cause disordered functions of the lungs, and on the other hand, some of the most important remedies for cough are to be sought among those medicines which act upon the stomach.

So far as the anatomy of the stomach is concerned, it may be briefly stated that it is a hollow membranous bag, placed immediately below the diaphragm, and separated from the heart by the intervention of that muscle, or rather, its tendinous centre. The stomach has the liver on its right side and the spleen on its left; the walls of the abdomen are in front, the vertebral column, the great vessels of the abdomen, the duodenum and the pancreas are behind it; and below it are the intestines. Its structure consists of three coats, an external *serous*, continuous with the serous covering, or peritoneum, of the abdominal cavity; a middle, or *muscular coat*, consisting of muscular fibres, disposed in three different directions, longitudinal, transverse, and oblique; and an internal, or *mucous coat*, which, on being magnified, presents a honeycombed structure, and which is the chief agent in promoting digestion. The stomach is abundantly supplied with blood from large arteries proceeding almost immediately from the aorta, and it



has extensive vascular connexions with the liver and the spleen. The nerves of the stomach, as has been previously remarked, are the terminal branches of the pneumogastric, which also supplies the lungs: and branches from the sympathetic system of nerves, which establish a connexion between the stomach on the one hand, and almost every important organ of the body on the other.

*The Liver*, although like the stomach, taking no active part in the operation of coughing, must not be omitted in enumerating the organs, the derangement of which may give rise to that affection. Not only may the functional derangements of the liver produce cough by the influence of the sympathetic system of nerves; but its organic derangements, such as enlargement and inflammation, may and do, by contiguity, as well as sympathy, excite corresponding disorder in the lungs.

The *Liver* is a solid organ of great size, weighing from three to four pounds on the average, and it occupies the right side, being placed within the ribs, and below the right lung, being separated from the latter only by the diaphragm. It is largely supplied with blood from the same source as that which supplies the stomach. Its nerves are derived from the sympathetic system.

To this list of organs, more or less concerned in the act of coughing, may be added the uterine organs, situated in the pelvis of the female subject. The womb, by its great distention under certain circumstances,



both of health and disease, often causes cough by its mere pressure; and even in its unenlarged condition, it frequently excites irritation of the lungs, in consequence of its functional derangements. The nerves of the womb are derived from the sympathetic system, thus establishing a connexion, which has been previously explained, between organs of the body most remote in their situation and different in their functions.

The structures which are immediately concerned in the act of coughing are the muscles of respiration. Breathing consists in the alternate admission of air into and its expulsion from the lungs, and in order to effect these two objects, a beautiful mechanism has been provided by nature, consisting of bones, cartilages, muscles, elastic fibres, soft tissues, and air-cells. The bones, which are themselves rigid and unyielding, are made to move upon one another by their connexion with cartilages and ligaments, and the soft tissues of the lungs are caused to admit and expel the air by the expansion and contraction of the adjacent parts. But the moving powers by which these operations are effected are the *muscles of respiration*.

The chief muscle of respiration is the *Diaphragm*. This musculo-membranous structure derives its name from the Greek verb διαφράττω, to divide or separate, because it separates the cavity of the chest from that of the abdomen. It has resting upon it above, the heart and the lungs, and below, it has in immediate contiguity with it the liver, the stomach, and the spleen.



It has an arched form, the convexity looking upwards; but when it contracts, it assumes a rather flattened condition. Now, by the contraction of this muscle the capacity of the chest is increased, and accordingly, we find that when air is drawn *into* the lungs, the diaphragm contracts, and on the contrary, when air is expelled *from* the lungs, the diaphragm relaxes: and this alternate contraction and relaxation of the diaphragm are really the essential conditions of respiration; for although there are several accessory circumstances attending this function, the action of the diaphragm is absolutely necessary. In fact, respiration may and does take place occasionally by the action of the diaphragm *alone*; but on the other hand, when the diaphragm is disabled from performing its functions, as by separating the nerves which supply it, immediate death is the result. Having thus stated that the diaphragm is the essential muscle of respiration, it is unnecessary to enumerate all the other muscles which, whether in health or disease, contribute to the effect; but it may be mentioned that the intercostal muscles, which are placed between the ribs, assist in the actions both of inspiration and expiration; and the other muscles, which are attached to the ribs both before and behind, assist in inspiration. In diseased conditions of the lungs, when those organs have lost their natural elasticity, the muscles of the trunk, of the head and of the neck are thrown into prominent and violent action; and to the eye of the physician, this visible activity of



certain muscles in the act of inspiration, is the sure indication of disorder of the lungs. Expiration is effected by various means contributing to one and the same end; the muscles of the abdomen are contracted, and thus press the abdominal viscera against the diaphragm, which relaxes, thus diminishing the capacity of the thorax; and the elastic fibres of the lungs in some measure contribute to squeeze out the air from their soft and spongy tissue. The action of the lungs themselves in respiration is not very great, except that their elastic tissue just described controls the admission and expulsion of air. The essential agents are the muscles of respiration, and especially the diaphragm.

It should be mentioned that the diaphragm is supplied with a proper nerve, called the phrenic nerve, derived from the spinal cord in the neck. When an injury of the spinal cord has occurred *below* the origin of this nerve, life may be prolonged, because respiration is not necessarily impaired; but when a serious injury has occurred *above* the origin of this nerve, death is instantaneous from the arrest of respiration. The other muscles of respiration are supplied with nerves from two sources, namely, from the *ordinary nerves of the spinal cord*, which are endowed with the faculties both of sensation and motion; and from the *sympathetic system of nerves*, which are unconnected with the ordinary faculties of sensation and motion. Hence, both from anatomical investigation and from actual experience, it is ascertained that respiration is a mixed func-



tion. In the waking state the act of breathing is in some measure under the control of the will, and a person may *hold his breath*, as it is called, for a short period without inconvenience, but the effort soon becomes painful and cannot be continued. There are no cases on record where a person has committed suicide by holding his breath, although such an act would be possible if respiration were completely under the control of the will. During sleep breathing is regularly carried on, and is of course, in this state, an entirely involuntary act.

Unlike the action of the lungs, the movements of the heart are wholly involuntary, being quite beyond the control of the will, although liable to be excited or disturbed, or retarded by the emotions and passions, and by certain medicinal, chemical, or even mechanical agents.

## PHYSIOLOGY OF THE PARTS CONCERNED IN COUGH.

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AFTER the description which has just been given of the anatomy of the parts concerned in coughing, the nature of that act will be readily explained. It consists of a series of violent and sonorous discharges of air from the lungs, accompanied with, or rather, followed by, deep and quick inspiration. The air is first drawn in and fills the lungs, then the glottis or aperture in the larynx is closed, just as expiration commences, but is burst open again by the rapid expulsive efforts of the expiratory apparatus. These efforts drive up a strong current of air from the lungs through the windpipe, and any irritating matter is thrown out of the system together with the air. Thus when mucus, or pus, or blood, is thrown out into the bronchial tubes or cells, it excites so much irritation that it requires to be expelled, and this is accomplished by the act of coughing. The parts concerned in coughing, therefore, are precisely the same as those concerned in breathing, and the mechanism of both processes is exactly the same; but in



breathing the air is admitted and expelled gently, and without noise, while in coughing the air is expelled violently, sonorously, and explosively, and in the intervals of these expulsive efforts the air is drawn in quickly and deeply. The lungs themselves being nearly passive in respiration are consequently without much active participation in the act of coughing; and offensive matters are discharged from the lungs by the action of the respiratory muscles rather than by any efforts of the lungs. To this statement some partial exceptions should perhaps be made: for the *vibratile cilia*, which have been described at page 11, as being situated in great multitudes upon the mucous membrane of the bronchial tubes, appear to be placed there for the purpose of sweeping away offensive matters from the interior of the lungs, and no doubt they co-operate with the muscles of respiration in effecting that object. The muscular fibres and elastic tissue of the lungs themselves also contribute to the production of cough, and, in certain morbid conditions, as in asthmatic bronchitis, the constriction of the muscular fibres gives a peculiar character to the cough.

Although the influence of irritating matters in producing cough has long been known, and is indeed a matter of common observation, yet the exact mechanism by which this act is excited has been explained only in late years; and to a distinguished physiologist, recently deceased (Dr. Marshall Hall), is justly due the merit of having shown the manner in which an irritating cause,



acting upon a given point, will induce muscular contractions at a distance from that point. It is true that Dr. Hall is not the exclusive discoverer of the theory of reflex action, for Prochaska certainly knew many of the principal points involved in this theory, and published them to the world long before the appearance of Dr. Hall's researches. It is only due to the latter, however, to observe that he was ignorant of Prochaska's views when he published his own memoirs on the subject, and that he is therefore entitled to the credit of original observation.

Without entering at large into the theory of reflex action, it may be stated generally that the phenomena consist in the production of muscular movements by the irritation of nerves not necessarily connected with the muscles, and certainly not engaged in supplying motor power. A grain of dust falling upon the globe of the eye causes immediate contraction of the eyelids; tickling of the back of the throat sometimes causes the expulsion of the contents of the stomach; the irritation of worms in the bowels may cause epileptic convulsions. The surface of the eye, in the first case, that of the fauces, in the second, and that of the mucous membrane of the intestines, in the third, are all supplied by nervous threads, which convey the impression made upon them to the spinal cord, and thence the impulse is given to the nerves acting on the muscles, thus producing the movements referred to.

The most common example of the occurrence of reflex



action, in reference to the present subject, is afforded by the accidental admission of a small quantity of liquid into the glottis : an event which is always followed by violent *coughing*, continued until every drop of the offending fluid is expelled. Now, the mechanism of this operation is explained by the fact, that the windpipe is intended to receive air, and nothing else ; and the consequence is, that as soon as a portion of fluid passes the aperture of the glottis, the nerves, which are placed as sentinels upon the mucous membrane in the vicinity, immediately convey the intelligence to the spinal cord, and by the latter the nerves of motion supplying the respiratory muscles are stimulated, and coughing and the consequent elimination of the foreign matter are the result. In the act of drowning, the glottis is closed against the admission of water, and in the bodies of drowned persons, only a very small quantity of water, if any, is found in the bronchial tubes, the death resulting, not from the admission of water, but from the exclusion of air. Again, when an animal is immersed in an atmosphere of carbonic acid, or sulphuretted hydrogen, or any other deleterious gas in a concentrated form, the muscles of the glottis firmly close the aperture against the admission of the poison, and the creature dies from the absence of air rather than from the presence of the noxious agent.

The act of coughing, then, is principally due to the effort made to expel some offending matter from the windpipe or lungs, whether it be a drop of fluid, acci-



dentally introduced into the glottis, or an undue or morbid secretion of mucus, of pus, or of fibrine in the respiratory passages or substance of the lungs. But the presence of a fluid, and, indeed, of any perceptible offending matter, is not absolutely necessary to produce cough, as will hereafter be seen : for it is very severe in pleurisy, where no fluid is poured out, at least in the first instance ; and indeed, it may be caused by the irritation of remote parts, as by teething, and the irritation of worms in children, by the derangements of the uterus in women, and by structural and functional disorders of the heart, and even of the stomach, in both sexes.

But coughing, although almost always caused by reflex action, and therefore in its nature involuntary, is not always and entirely so. For the act of coughing may be produced voluntarily, as is sometimes done for the purpose of deception ; and on the other hand, by an effort of the will, coughing may in some measure be suppressed. Still, speaking in general terms, it may be affirmed that cough is due to reflex action produced by the presence of irritation in the lungs, or in some other part of the body. The object of cough, in removing sources of irritation from the lungs and respiratory passages, is sufficiently obvious ; but it is not so easy to explain why this act should be caused by such circumstances as teething, the presence of worms in the intestinal canal, disorders of the stomach, and deranged conditions of the uterus. Yet such are sometimes the causes, as will be described in the following pages.



## PATHOLOGY AND TREATMENT OF COUGH.

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FROM the preceding remarks upon the anatomy and physiology of the parts concerned in cough, it will be observed that the act of coughing is caused by the existence of some irritating substance in the lungs or air-passages, or by some irritation not necessarily connected with the lungs at all, but operating by sympathy upon the nerves and muscles concerned in the respiratory process. Cough may therefore be considered not so much a morbid condition in itself, as a symptom or indication of some general or special disease of the system; and it would be highly unphilosophical to treat empirically a symptom which may be induced by a great variety of causes, and may require the most various and even the most opposite methods of treatment. In all cases of cough, a diligent search should be made for its cause, whether existing in the lungs or air-passages, or whether connected with some other general or special derangement of the system. In the case of infants and children, the processes of nutrition and dentition should be carefully investigated; the presence or absence of worms should,

if possible, be ascertained; the state of the bowels should be regularly examined; and all this should more especially be done when there is an absence of any symptoms or physical signs indicating disease of the lungs and air-passages. In adult and middle life, especially in females, not only should the lungs and heart be carefully examined by auscultation and percussion, but inquiries should be made into the state of the digestive, and in the female, of the uterine functions; for cough may be a mere symptom of derangement in these particulars. But it must not be forgotten that stomach and uterine complaints, although occasionally the cause of cough, are often sympathetic disorders, depending upon some morbid state of the lungs; and an insidious development of tubercles in the chest may be overlooked, if the practitioner is too intent upon the treatment of secondary maladies which are the concomitants of more serious disease. But, notwithstanding all that has just been advanced, there can be no doubt that cough is occasionally *idiopathic*, that is to say, that it springs from some irritation peculiar to itself, and which cannot be brought into the category of known diseases. Of such a character are the coughs which are often met with in children and in old persons, in whom, after the most careful examination, no appreciable cause can be ascertained, and in whom the affection yields to ordinary remedies. The first kind of cough to be examined, therefore, is



## SIMPLE COUGH.

This affection is very common in early and advanced life, and appears to be due to temporary and remittent irritation of the bronchial mucous membrane, without fever and without inflammation. It is prevalent in the winter and the spring, and sometimes appears at the end of autumn. The patients present no auscultatory phenomena denoting disease of the respiratory organs, and all the other organs and functions of the body may be in a healthy condition ; and although during the night, or at other periods, the cough may be very distressing and may prevent sleep, yet in the intervals the patient is quite well, or at most is troubled only with a slight hoarseness. The attendant symptoms of this kind of cough are, of course, rather negative than positive, and are indeed almost confined to the characters presented by the cough itself, which may be hoarse, or loud, or barking, or ringing, as the case may be. In the intervals there is no difficulty of breathing, no thirst, no heat of skin, there are no morbid sounds in the chest ; and the cough is attended or followed by little or no expectoration.

*Treatment.*—The treatment of simple cough in young children consists in the administration of demulcents, diaphoretics, and mild expectorants. The effect of demulcents is to soothe irritation of the mucous mem-

branes, and although none of these agents touch the pulmonary tissues, yet by sympathy they allay the excitement which produces coughing. This circumstance is explained, not only by the general sympathy which exists among the mucous membranes in all parts of the body, but by the special sympathy which exists among the branches of the pneumogastric nerve, which, it will be remembered, supplies nervous influence both to the stomach and the lungs, and thus establishes a close relation between these organs. Barley-water, linseed tea, decoction of mallows, mucilage of gum arabic, almond emulsion, liquorice, and a great variety of other mucilaginous substances are commonly employed as demulcents; and in the case of children are sweetened with sugar to render them more palatable, except in the case of liquorice, which contains sugar in its composition, and is therefore a general favourite. Jujubes, which profess to be made of the mucilaginous juice of the *Zisypus Jujuba*, but which really contain only gum and sugar stiffened with gelatine, are quite harmless, and are beneficial; and the fact is, that although colts-foot, and horehound, and elecampane, and a multitude of other plants have been recommended by various authorities, and some still hold their place in the pharmacopœias, yet their properties depend upon one circumstance—that they all contain a bland innocuous juice, which sheathes the mucous membrane of the part to which it is applied, and moreover allays irritation in remote parts. That this influence is real there can



be no doubt, and it extends to parts of the mucous surface at a great distance, and performing very different functions from those to which the demulcents are immediately applied: for most of the soothing drinks employed to allay cough are almost equally useful in allaying irritation of the urinary organs, although these latter have no direct connexion with the stomach, and are only related to it by that general sympathy which exists between the different portions of the mucous membrane throughout the body. Diaphoretics are also useful in the treatment of cough in children, for these medicines induce a determination to the skin, and thus relieve irritation of the pulmonary mucous membrane. Among the best of the mild diaphoretics are the *spiritus ætheris nitrici*, or sweet spirits of nitre, of which a teaspoonful may be given in some mucilaginous fluid. *Ipecacuan wine* is also a popular and a very good remedy: it acts in small doses as a diaphoretic, and even if it should accidentally induce vomiting, it will not be injurious on that account. It may be administered in doses of ten minims, in a little water or barley-water. *Antimonial wine*, which is a solution of the potassio-tartrate of antimony, in sherry, is also an excellent remedy in the coughs of children, especially when the patients are of a plethoric or inflammatory tendency; but it should be avoided in weak and delicate subjects. It also requires more care in its administration than the other remedies just indicated, because it lowers the action of the heart, and an overdose of it



might produce disagreeable consequences. To a child a year old, ten minims may be given; at two years old, the dose may be doubled; and at three years and upwards, half a drachm may be safely administered. Mild expectorants may also be given in the coughs of children, but the more powerful medicines of this class should be avoided, as likely to cause congestion of the mucous membrane, and thus increase irritation. The best remedy of this kind is either the *oxymel* or the *syrup of squills*, which may be given in doses of a teaspoonful, and occasionally repeated. The combined sweetness and acidity of the oxymel are agreeable to children, who take it often with avidity. If they take too much of it, it may induce sickness; but this is not a matter of much importance. It should be observed that in the coughs of children, and indeed in all complaints to which they are liable, the state of the bowels should be carefully observed, and the administration of mild aperients is always a necessary step.

Having thus indicated the medicines which are appropriate for the simple cough of children, it is necessary to observe that in these subjects all opiates should, as a rule, be carefully avoided. Children, especially infants, are peculiarly susceptible to the influence of opium, and a very few minims of an opiate tincture may induce fatal narcotism. Hence such medicines as Dalby's Carminative, and other nostrums containing opium, should be banished from the nursery, both on account of the dangerous nature of the operation of opium on



infants, and from the fact that these drugs are often administered by ignorant nurses, whose only object is to keep the children quiet, while perhaps the diseases under which the patients are suffering are wholly unnoticed. The only drug of an opiate nature which is at all admissible in the coughs of children is the syrup of poppies, prepared from the capsule of the poppy; but this preparation is often improperly made of opium, and cannot therefore be recommended unless the source of its manufacture is accurately ascertained.

The simple cough of old persons requires a somewhat different treatment from that adapted to children. In the latter, the powers of life are usually in an active and vigorous condition, and the chief danger to be apprehended is the supervention of inflammation. Hence the medicines of a somewhat depressing character, such as ipecacuan wine and antimonial wine, are of great service; but in old persons the powers of life are becoming already depressed, and remedies of a stimulating character are required. Therefore, in addition to diluents and demulcents, which may be employed with advantage, the bronchial mucous membrane should be stimulated by the stronger kinds of expectorants. Among these are the *balsams of Peru and Tolu*, and the preparations of *ammoniacum* and *squills*. The *mistura ammoniaci*, which is a kind of emulsion, consisting of ammoniacum suspended in water, is useful as an internal remedy, and the *emplastrum ammoniaci* may be applied over the chest. The *Pilula Scillæ Composita*, which



contains squills and ammoniacum together, is an excellent preparation, and may be given in doses of five grains; and the *tincture* and the *oxymel of squills* may also be recommended.

With respect to opiates in the simple coughs of old persons, they should, as a general rule, be avoided, because they tend to produce congestion; and if there is any bronchitis present, they will rather aggravate the malady: but if it is ascertained that there is no inflammation or congestion of the bronchial tubes or lungs, some of the preparations of opium may be employed with advantage. The best medicine of this kind, in the cases now alluded to, is the *Tinctura Camphoræ Composita*, or paregoric elixir; in which the camphor and the opium allay the irritation, while the benzoic acid acts as a gentle stimulating expectorant to the bronchial membrane. Among the class of sedative medicines, several may be used with advantage; and although opium, as has just been observed, is not to be employed without great caution, yet *hyoscyamus* and *conium*, separate or together, in doses of two or three grains of each, may be given with benefit. *Stramonium* may also be employed in the same manner, and cigars, made of the leaves of this plant, are smoked for the purpose of allaying irritation. It has recently been observed that the reason of the inefficacy of these cigars in some cases arises from the fact that they are prepared from the *Datura Stramonium* of this country, which is of inferior power; but when prepared from



the *Datura Tatula*, a larger and exotic species, they possess their full sedative influence. Cigars, prepared from the *Datura Tatula*, grown by Mr. Savory, of Bond-street, were lately exhibited to the Medical Society of London, together with a specimen of the plant itself, which is of large proportions. The smoking of *Tobacco*, from the sedative properties of that plant, is also occasionally serviceable in the simple coughs of old persons.

#### COUGH FROM TEETHING.

In treating of reflex action, it was shown that the irritation of one organ or set of organs, might, and often does produce, disturbance of other organs at a distance. Now morbid reflex action is particularly observable in infants and children, in whom, from the delicacy and mobility of their organization, sympathetic irritation is readily set up between parts apparently unconnected with one another. The process of dentition, commencing usually about the age of six months, is often accompanied by serious disturbance of different parts of the system, and the life of the child is not unfrequently threatened, or even cut short by disease. Among the morbid phenomena caused by this process, cough is a frequent symptom; and from its sudden and violent character often simulates bronchitis, croup, and whooping-cough. It is necessary that the medical attendant should bear in mind the frequency of this occurrence during the process of dentition, as the promptness of his diagnosis

and treatment will be followed by the most beneficial results. If, then, it is found that a child is attacked suddenly, especially in the night, with a hoarse croupy cough and restlessness, and if the process of dentition is advancing, the gums being swollen, red, shining, and tender, no time should be lost in making a free incision into the swollen parts. This trifling operation relieves the strain upon the gums, while the slight loss of blood which ensues, serves to cool the local heat and subdue irritation. The cough generally ceases immediately, and if it should return at any subsequent period, the repetition of the operation will be attended with the same benefit. Even if the teeth do not protrude after the incision, the operation can do no harm, nor can its repetition be in any way injurious, provided an ordinary degree of care be exercised, while the beneficial effects upon the health and spirits of the child, and the sudden disappearance of the cough, if any is present, are often quite marvellous. If, again, bronchitis or croup is really present, the lancing of the gums can do no harm, and may do good; although, of course, this operation will not then cure the disease.

#### COUGH FROM WORMS IN THE INTESTINES.

Another occasional cause of cough in children, is the presence of worms in the intestinal canal. The existence of these parasites gives rise to numerous unpleasant and distressing symptoms, and, like the irritation of



teething, may occasion the erroneous belief that the child is affected with far more serious disease. Not only may sympathetic cough simulate disease of the lungs, but convulsions may appear to indicate disease of the brain. The expulsion of the unwelcome strangers will be attended with immediate relief of the symptoms, and the speedy restoration of the child's health; but, unfortunately, it is not so easy to expel intestinal worms as to lance the gums, and hence children often suffer long and severely from symptoms caused by the presence of these intruders.

When a child has been suffering from a hard and dry cough for a considerable period, and when, after a careful examination, no physical disease can be detected in the chest; if the period of teething has passed, or that process is advancing healthily and regularly; and if, moreover, the child is restless at night, frequently gnashes its teeth, sometimes starts up screaming from its sleep; if the bowels are irregular or constipated, or if the stools are pale-coloured and slimy; if the appetite is capricious, or ravenous, or absent; if there is irritation of the nose and about the margin of the anus, leading the child to scratch those parts; if these symptoms exist, there can be little doubt of the presence of worms in the alimentary canal, or at least of some source of irritation, which ought to be removed from that region.

The most troublesome kind of worm, and the most difficult to remove, is the tape-worm, or *tænia solium*; and the difficulty of its removal arises in great measure



from the fact of its extreme length, and its divisibility into segments, many of which may come away without destroying the vitality of the remaining parts. Another kind of intestinal worm is one of considerable size, and resembling an earth-worm in shape, named *ascaris lumbricoides*. This worm comes away entire, with relief of the symptoms; but another may be left behind, and may also require removal. A third kind of worm is the *oxyuris vermicularis*, a small, thin species, which occurs in great numbers, chiefly near the orifice of the anus, whence it often creeps out.

*Treatment.*—If the cough depends upon the presence of worms, they must of course be removed; and no permanent relief can be anticipated, until this object is accomplished. A variety of remedies has been recommended for the expulsion of tape-worm, among which are the *root of the male fern*, *powdered tin*, the hairs of the *stizolobium pruriens*, the bark of the *pomegranate*, *kousso*, and the *oil of turpentine*. All these anthelmintics have had their advocates, and it is sometimes necessary to employ several in succession before the worm is expelled. Here it may be stated generally, that none of them are dangerous medicines; and even if they do not succeed in their object, no harm is done to the system. In the case of oil of turpentine, a large dose is better than a small one, because the former passes rapidly through the system, while a smaller quantity might cause irritation of the urinary organs. The best eliminants of the *ascaris lumbricoides* and the *oxyuris*



*vermicularis* are brisk purgatives, more especially *calomel*, which may be given in doses of two or three grains, and repeated at intervals, until the worm is expelled. In conjunction with *calomel*, a purgative powder may be administered, and the best preparation for this purpose is the *pulvis scammonii compositus*, consisting of scammony, jalap, and ginger, which may be given in doses of from five to ten grains in some treacle or jelly. If these medicines do not bring away the worm, they remove a large quantity of mucus which almost always exists in the intestines of children, and is a fertile source of irritation; and, in these subjects, whether there are worms or not, the administration of a brisk purgative, such as that just indicated, is never injurious, unless the child is very delicate. As a general rule, in the diseases of children, the bowels should be plentifully evacuated, as the accumulation of matters in the intestinal canal often gives rise to the most serious consequences; and on the other hand, the most threatening symptoms are sometimes relieved at once by a free action upon the bowels.

#### COUGH FROM AFFECTIONS OF THE TONSILS AND UVULA.

It has already been stated that at the entrance of the throat there are two glands, one on each side, called the *tonsils*, and between these, and hanging over the throat, is a small conical body called the *uvula*. In the natural state, these parts have but little sensation, although,



when inflamed, they give rise to great inconvenience ; but it very frequently happens, especially in delicate children, that the tonsils become enlarged, and press so much upon the aperture of the larynx, as to give rise to severe and distressing cough. The uvula also is often relaxed, and by hanging down to an undue length, and tickling the orifice of the larynx, occasions the same inconvenience. The cough arising from these causes is sometimes of the most aggravated character, and lasting for a long period, it almost wears out the patient, most seriously affecting the general health, and not unfrequently giving rise to the suspicion of the existence of pulmonary tubercles. Although the nature of these affections of the tonsils and uvula is sufficiently obvious on examination, yet the cause of the cough is often allowed to remain undiscovered, while fruitless attempts at alleviation are made by the administration of medicines to allay cough, or, what is worse, by leeches and depletion, although the subjects under treatment are almost always of delicate and feeble habit.

*Treatment.*—The treatment of enlarged tonsils and relaxed uvula should be *general* and *special*: the first having for its object to support the powers of the constitution, the second to remedy the local disease. As weak and strumous persons are the most liable to these affections, strong purgatives, and indeed all treatment of a lowering character should be avoided ; the strength should be supported by meat, wine, and porter ; moderate exercise, in the open air, should be recommended,



and sea-bathing should be practised. The preparations of iron should be administered; and one of the best forms of administration is the *syrup of the iodide of iron*, which may be given in doses of a teaspoonful once or twice a-day; or, the *citrate of iron* may be given in doses of five grains, in porter, an agreeable form of administration. The *citrate of quinine and iron* is also an excellent preparation, and may be given in doses of two or three grains to a child, or five grains to an adult; or, if the habit of the patient be strumous (as indeed it generally is), the *cod-liver oil* may be given in the dose of a teaspoonful for a child, or a dessert spoonful for an adult daily, in orange wine. The medicated cod-liver oil, now sold by most chemists, and containing proportional quantities of *iodine, quinine, and iron*, may also be strongly recommended.

The *special* treatment of these affections aims at reducing the size of the tonsils and uvula, and thus removing the sources of irritation. For this purpose, astringent gargles, containing some of the dilute mineral acids, as the *sulphuric, nitric, or hydrochloric*, mixed with *alum*, and sweetened with honey, may be recommended; but in addition to this treatment, and instead of it, when, from the early age of the patient, gargles cannot be employed, the fauces, tonsils, and uvula should be rubbed over gently with solid *nitrate of silver*, or a strong solution of this salt should be applied to the parts. The effect of this application is to cause shrinking of the organs, and to induce a healthy action;



and this local treatment should be repeated at intervals until the symptoms are relieved.

It is quite astonishing how great an improvement is often effected in enlargement of the tonsils and uvula, and their attendant inconveniences, by the treatment now pointed out ; and many children are thus converted from a feeble and puny condition into one of health and vigour. But sometimes the enlargement of the tonsils is so great, and the elongation of the uvula so intractable, as to require the adoption of surgical means in the treatment. The uvula, by its chronic elongation, and by its constant irritation of the upper part of the larynx, sometimes causes incessant and violent coughing, with serious derangement of the general health, and in cases where the means above described have been resorted to without avail, it becomes necessary to cut it off, an operation which is easily performed, is almost without pain, and, with great and immediate relief of distressing symptoms, entails no subsequent inconvenience, as the uvula is not an organ of much importance. Mr. Yearsley, in his book on *Throat Ailments*, prefers the entire excision of the uvula to the practice once adopted of *snipping* off the end, because, as he justly observes, if a portion is left behind, it acts as a source of continued irritation, whereas the total removal obviates every chance of future annoyance, and the loss of the part is not felt by the patient.

When the tonsils are so much enlarged as to become sources of constant annoyance, they must be



excised, or rather a portion of them must be cut off. This operation is not painful, because these parts are not endowed with much sensibility under ordinary circumstances; but, as they are supplied with nervous branches by the glosso-pharyngeal nerve, which communicates closely, and has a common origin with the pneumogastric, the consequence is, that an operation upon these parts causes, by reflex action, an involuntary effort at vomiting; and this is the only real difficulty which the surgeon encounters in the performance of this operation. It is, however, necessary that the patient should remain very quiet while it is being performed, a condition which is not always easily attained in the case of children. It is merely necessary to seize the morbid growth with a tenaculum held in one hand, and with the other hand to cut off a portion by means of a knife constructed for the purpose. The only requisites for this operation on the part of the surgeon are tact, firmness, and celerity; and the after-consequences are very trifling. Some blood is lost, but it is only venous, and is soon arrested; and the structure, into which the incision has been made, soon heals, contracting as it cicatrizes, and the entrance of the throat is then left free. The operation is not only useful in removing a portion of the enlarged organ, but the application of the knife imparts a healthy action to the remaining part, which becomes firm and of a red colour, instead of being, as it was before, spongy, flabby, and pale. If the parts should not heal readily, the application of the



solid nitrate of silver will accelerate the process, and the use of some astringent gargles will complete the cure.

#### COUGH OF LARYNGITIS.

When treating of the anatomy of the parts concerned in cough it was shown that at the base of the tongue there is a flap of fibro-cartilage, covered by mucous membrane, called the epiglottis, which, in the natural state, closes up the entrance into the windpipe; and that, on turning away the epiglottis, the cavity of the larynx, or as it is sometimes called, the glottis, is brought into view. Here there is observed a longitudinal fissure, passing from before backwards, and called the *rima glottidis*, or chink of the glottis, bounded on each side by a fibrous band, or ligament, which together are called *chordæ vocales*. Through this narrow chink the air passes in its transit into and out of the lungs, and it is moreover by the impulse of the air from the lungs, aided by the muscular apparatus attached to the larynx, and acting upon the vocal chords, that the phenomena of voice and musical sounds are produced. The glottis is, as it were, the sentinel keeping watch over the entrance to the lungs, and consequently, when any irritating matter impinges upon its mucous surface, or when any part of its own surface is irritated or inflamed, immediate coughing is the result, by which the offending matter is dislodged, if any is present, or by which notice is given of any internal source of irritation.



It will, therefore, at once be seen that any inflammatory affection of this part is attended with the utmost danger to life, because the inflammation is attended by swelling, and followed by effusion, by both of which the orifice is narrowed or even obliterated; and death ensues from the stoppage of the passage of atmospheric air to the lungs.

*Laryngitis*, or inflammation of the larynx, is of two kinds, *acute* and *chronic*; the former may cause death by the rapid closure of the glottis, the latter is often equally fatal, although in a more gradual manner; of the two forms, the acute is the most amenable to treatment, and the application of prompt and vigorous measures is often, and indeed, generally, attended with a happy result. Acute laryngitis may be caused by exposure to cold and wet, or it may arise without any assignable cause; sometimes it is produced by the direct application of injurious agents, as when children drink boiling water out of a tea-kettle; and sometimes it is a result of the extension of the action of burns; it is occasionally, and not unfrequently, an accompaniment or a consequence of small-pox and scarlet fever; and sometimes erysipelas extends to the larynx, causing inflammation. In the bodies of those who have died of acute laryngitis, the appearances observed are redness and swelling of the mucous membrane of the larynx, with effusion, beneath the membrane, of serum, and occasionally, though more rarely, of pus. Altogether the post-mortem appearances, in most cases, appear inadequate



to account for the fatal result, for the vascularity and swelling of the membrane are very much diminished after death, and the existence of effused pus is not very common. It is by coupling the phenomena during life with the appearances after death, and by reflecting upon the great importance to life of the aperture of the glottis, that the real danger of inflammation of the larynx may be estimated; for in any other portion of the mucous membrane a similar amount of inflammation would be productive of only trifling results; but by occupying the narrow chink, which is the only passage for atmospheric air into the body, it becomes a disease of the greatest importance and threatening the utmost danger to life.

The *cough* in this disease is a constant symptom, and is husky and sometimes convulsive, always attended with hoarseness, and sometimes with loss of voice. The symptoms at their commencement resemble those of a common cold, with which it is very desirable that the disease should not be confounded; because the remedies adapted to a common cold would only involve the loss of valuable time in the treatment of acute laryngitis. The cough is *dry* in laryngitis, being unattended with any expectoration, and the inspiration is sonorous, painful, and prolonged. The hoarseness and loss of voice attended with this kind of cough will give some indications of the existence of this disease, which is more fully confirmed by the signs of general fever, hot skin, full and rapid pulse, thirst, and distaste



for food. Pressure upon the larynx causes pain, and excites coughing; but very little information is gained by an inspection of the fauces, for the cavity of the larynx, as was formerly observed, is concealed by the epiglottis, and it is therefore only by the other general and special symptoms that the disease can be recognised. Occasionally, however, the fauces are red and swollen, and the epiglottis is also seen to be swollen and inflamed.

If this disease is permitted to go on unchecked, the symptoms change their character, and the patient begins to suffer from the effects of incipient suffocation, under which he eventually sinks. The effect of the complaint, as has been already mentioned, is to cause swelling of the glottis, and thus to close more and more the aperture for the admission of the air; and the patient dies, in fact, just as he would do if he were drowned or hanged.

*Treatment of Acute Laryngitis.*—After the remarks which have been made on the nature and the results of acute laryngitis, it is almost needless to observe that mere palliatives and medicines calculated to subdue cough are worse than useless, because they waste the time which ought to be devoted to the speedy repression of the disease. If therefore the patient is moderately robust, and has been previously in good health, blood, in rather large quantity, should be drawn from the arm, and the sooner this operation is performed the better; because, when the first stage of the inflammation has



passed, and effusion has commenced, the patient may not be able to bear the loss of blood, and he may sink the more rapidly from the weakness which it causes. But I can assert, from considerable experience, that the early adoption of blood-letting in this disease is a most valuable measure, and often saves the life of the patient; while its omission may allow of the supervention of the worst symptoms. If the patient is not relieved by a single copious blood-letting, and the pulse remains full and strong, the operation may be repeated; but if it should not appear justifiable to bleed the patient a second time from the arm, an adequate number of leeches should be applied to the throat, or blood should be drawn by cupping from the nape of the neck. Concurrently with these measures, *calomel* should be administered, either in powder or in a pill, in doses of three or four grains every three or four hours. The effect of this medicine is to allay inflammatory excitement, and, what is of infinite importance in this disease, to prevent effusion beneath the mucous membrane. The *calomel* should be continued until the action of mercury is established in the system. The preparations of antimony, particularly *the potassio-tartrate of antimony*, are also useful in this disease, although I do not place so much faith in their operation in laryngitis as in some other diseases of the respiratory organs. The *potassio-tartrate of antimony* may be administered in doses of half a grain, in some saline purgative and diaphoretic, as Epsom salts and solution of acetate of ammonia, every



three or four hours, alternating in its administration with that of the calomel, lest the latter should be ejected, by vomiting. After this treatment has been successfully adopted, and only some cough and hoarseness remain, indicating probably some degree of thickening or persistent irritation of the mucous membrane, a small blister may be applied to the upper part of the chest, or that part may be rubbed with some stimulating embrocation.

In case the means above indicated should fail in relieving the symptoms, and the obstruction to the passage of the air through the glottis should threaten to destroy the patient by suffocation, it sometimes becomes necessary, as a last resource, to perform the operation of *tracheotomy*. In this operation, an incision is made into the windpipe, and the air is admitted into the lungs by means of a bent metallic tube. By this operation the patient has been saved from impending suffocation. It is particularly adapted to those cases in which the swelling of the glottis has come on suddenly and from accidental causes, as, for instance, from imbibing hot water from the spout of a tea-kettle, as is sometimes done by children; but the operation has occasionally succeeded in some other instances where ordinary treatment has failed.

While treating of this subject, I cannot help denouncing with all the force which I possess, the inefficiency, and I might add, the knavery of the so-called homœopathic system, in the management of such a disease as acute laryngitis, in which it may be said, "*horæ momento, aut cita mors venit, aut victoria læta,*"



and in which the delay of efficient measures may entail the worst results. To mock the sufferings of a dying patient, by the administration of inert and useless globules, while the adoption of a rational and vigorous plan of treatment might restore him to life, appears to me to be nothing less than to ridicule human misery, and to welcome the approach of the angel of death. I can only hope that if any honest homœopath (if there be such a person) should meet with a case of acute laryngitis, he would, at least for the occasion, renounce his creed, and prefer the sacrifice of a dogma to the destruction of a fellow-creature. Nor can I omit to observe, that I by no means coincide in the views of those who believe that, because diseases have, in the present day, changed their type, and, because bleeding is not generally so well borne as it formerly was, *therefore*, all bleeding and all depletion are injurious. I believe, on the contrary, that in certain cases the abstraction of blood is not only justifiable, but is imperatively demanded, and I believe that acute laryngitis is a case in point.

The *chronic* form of laryngitis is a very different disease from the acute, both in its anatomical characters, and in its progress and termination. In the acute form, we have a disease which is marked by violent inflammatory symptoms, which pursues a rapidly fatal course, but which is often arrested, or entirely cured, by appropriate treatment; in the chronic form, on the other hand, we have a troublesome and painful affection, lingering for a long period, often associated with



organic disease of the lungs, rebellious to all kinds of treatment, and wearing out the patient by protracted suffering. Chronic laryngitis, in its simplest form, is characterised by habitual harsh, dry *cough* and hoarseness, and is frequently observed in cab-drivers and others who are much exposed to cold and wet, and in these persons it may continue for several years. In its more severe manifestations, it is marked by violent *cough*, excited by the slightest irritation, and even by the inhalation of cold air, hoarseness advancing to complete loss of voice, pain and soreness in coughing, difficulty of breathing, tenderness over the region of the larynx; and, still later, the expectoration of mucus, pus, or even blood; and, finally, the patient may be carried off by the violence of the cough, and by the progressively increasing debility.

The appearances observed after death, in the affected parts, are redness of the mucous membrane, with thickening of the subjacent tissue, and ulcers more or less extensive, both superficial and deep. It is from these ulcers that the blood and pus are produced, when those matters are expectorated in chronic laryngitis.

Chronic laryngitis often commences with the symptoms of a common cold, and unless the true nature of the disease is early understood, it may become permanently fixed upon the system. It is sometimes the result of the extension of syphilitic disease from the back of the mouth, but most generally it is associated with, or preceded, or followed by tubercular disease of



the lungs. The latter complication constitutes a most dangerous affection, and in forming an opinion upon the probable result of any given case, great care should be taken to examine the physical condition of the lungs; for if there should be signs of tubercular disease in these organs, the state of the patient must give rise to the most serious apprehensions.

*Treatment.*—As chronic laryngitis is not characterized by the strong inflammatory symptoms which have been described in the case of the acute disease, the same prompt and energetic measures are not required, and, indeed, they might be injurious. Nevertheless, in the early stages of the chronic disease, and before the constitution of the patient has been seriously impaired, the application of leeches beneath the larynx may afford relief, and a mild course of mercury may tend to subdue the morbid action advancing in the larynx. Much benefit will be derived from counter-irritation applied at some distance from the affected part; but blisters are objectionable from the general irritation of the system which they occasion, and more relief will be obtained from tartar-emetic ointment applied over the upper part of the chest, or the application of some stimulant liniment in the same situation, such as a mixture of *strong acetic acid*, with *oil of turpentine*, and *olive oil*. The administration of demulcent and expectorant medicines is not of much avail, because they do not appear to reach the seat of disease, and do not therefore allay the cough, and I think the chief benefit is to be anticipated



from frequent counter-irritation in the manner just indicated. If the patient is living in a cold and damp situation, he should be removed, if possible, to a warm and dry one; he should protect himself from the inhalation of cold air by wearing a respirator; he should adopt a mild and nutritious, but not too stimulating diet. A course of *iodide of potassium* may perhaps prove serviceable, and *cod-liver oil* should be tried in all protracted cases, and more especially if any tubercular disease is discovered or suspected.

The local medication of the larynx in these cases is a point deserving notice. Much benefit will often result from the inhalation of steam, as this vapour tends to soothe and relax the irritated membrane, and to promote expectoration from its surface. It has also been recommended of late years to apply certain caustic solutions to the inflamed membrane itself; but, although I have recommended and adopted this plan on several occasions, I am not sure that the results have been perfectly satisfactory. The plan of the application recommended by Dr. C. J. B. Williams, is to place a piece of sponge, dipped in a strong solution of nitrate of silver, at the end of a piece of whalebone, bent, at an inch from the sponge, to an angle of eighty degrees. The patient's mouth being widely opened, and the tongue pressed down with a spoon, the sponge is passed behind the epiglottis, and the solution enters the larynx. Convulsive cough will follow the application, which, however, is unattended with pain. The cough is the result of reflex action,



and from the same physiological cause, vomiting is sometimes induced.

But, while thus doubting, whether, in confirmed and severe cases of chronic laryngitis, the application of caustic solutions is attended with invariable benefit, I have no doubt whatever, that in the milder forms of inflammation of the mucous membrane, at the back of the mouth, near the larynx, the application of a strong solution of the nitrate of silver to that region is of the utmost service. The caustic acts as an astringent upon the inflamed parts, and converts a morbid into a healthy action. The same approbation may be bestowed upon the local application of solution of the nitrate of silver, in those cases of partial laryngitis, observed among the concomitants of severe forms of scarlatina and small-pox, where the inflammation of the fauces extends downwards into the larynx. In such cases, the plan of cleaning the back of the mouth and the fauces from the decomposing mucous membrane which hangs to them, and touching the clean surface with the application referred to, is a measure which ought never to be neglected.

In what is called Clergyman's Sore Throat, which is a low form of inflammation about the fauces, attended with relaxation and debility, and partially affecting the larynx, the local application of solution of nitrate of silver, or of the solid caustic, will often be found beneficial. To this measure, however, should be added relaxation from duty, change of air, and a careful attention to the state of the general health.



## LARYNGISMUS STRIDULUS,

Or the Crowing Convulsion of infants, although not characterized by Cough, properly so called, is a very important disease, from its resemblance, in some respects, to Hooping Cough and Croup; and it is so often a fatal malady that it is necessary to describe it briefly in the present treatise. In Hooping Cough and Croup, as is well known, there is a peculiar long, stridulous inspiration, accompanied by a loud cough; but, in Laryngismus Stridulus, there is only a long hooping, or crowing inspiration, without a cough. In this latter disease, the child starts up suddenly, often during sleep, and after struggling for breath for some time, draws a long inspiration, accompanied by the crowing noise, from which the name is derived. After this the patient recovers its breath, although it is not restored to health for some hours. The disease is often fatal, but, on a post-mortem examination, no morbid appearance has ever been detected in the larynx, which is the seat of the disease.

Although this very dangerous infantile malady has been carefully studied of late years, its pathology is not yet perfectly understood. The only theories advanced respecting its physical cause, are two in number; one considers that it depends upon an enlargement of the Thymus Gland, and the other, that it is a consequence of glandular tumours, pressing upon the inferior laryngeal branch of the pneumogastric nerve. But,



although these theories were supported by the observations of some distinguished physicians, and corroborated by post-mortem examinations, it has been found that subsequent experience has not confirmed the views thus propounded. The most probable nature of the disease is that it is one of reflex action, being excited in feeble children by irritation of some organs remote from the larynx. Among the most common exciting causes of this character are the process of teething and the presence of irritating matters in the intestinal canal. Why the excitement of dentition, or disordered conditions of the bowels, should cause a spasmodic, and sometimes fatal closure of the glottis, is one of the secrets of pathology which we cannot hope altogether to unravel; but the investigations of anatomy, and the beautiful theory of reflex action, exhibit to us the mechanism by which laryngeal spasm may be caused, and the knowledge thus obtained throws no small light, as will presently be seen, upon the treatment of the disease.

Laryngismus stridulus consists essentially in a narrowing, or closure of the *rima glottidis*; the child, in the first instance, struggles violently for breath, and when the object is accomplished, the air enters through the contracted aperture, and hence the crowing sound. When the glottis is fully opened, the stridulous inspiration ceases, and in the intervals of the attacks, the child breathes as usual, a feature which clearly distinguishes this disease from Croup. After the remarks which have been made in previous chapters, the import-



ance of the aperture in the glottis to the maintenance of life will be fully understood, and the closure of this aperture, even for a short period, must necessarily induce asphyxia, followed sometimes by death. The pulse in this disease is not increased in fulness or frequency, and there are no symptoms of fever.

*Treatment of Laryngismus Stridulus.*—The peculiar crowing inspiration which is characteristic of this affection, has sometimes caused it to be mistaken for Croup, and most dangerous results have followed from such a mistake. In fact, it requires a totally different treatment, and it may be stated at once, that depletion is entirely contra-indicated in laryngismus stridulus, except that the bowels should be kept open by mild aperients, in the intervals of the attacks. The attacks themselves come on so suddenly, and last for so short a time, that there is not any opportunity for the application of remedial measures, and it is in the intervals of the paroxysms that the treatment must be employed. As it is certain that the fits depend upon irritation in some part of the system, or upon some derangement of the general health, the source of the irritation must, if possible, be discovered. The children most liable to this disease are infants cutting their teeth, and particular inquiry and inspection should, invariably, be made as to the condition of these organs. It will, probably, be found that some of the teeth are pressing up the gum, which is swollen and tender, and no time should be lost in making free incisions over the teeth, whether



they are ready to protrude or not. As has been noticed before, the free division of the gum (performed, of course, with moderate care) may be of infinite service, and can never do any harm, for the worst results of this operation are only a trifling pain and a slight loss of blood, while the relief of irritation is immediate, and the removal of dangerous symptoms is often accomplished. The use of the warm bath is also to be commended, for it is soothing to the feelings of the patient, and it tends, moreover, to draw off to the surface the congestion which may be fatally at work in the interior. When the paroxysms have ceased, care should be taken to prevent their recurrence by attention to the general health. As the disease is generally found to prevail in infants of feeble constitution, or in the ill-fed offspring of the poor, the powers of the system should be sustained by a well-regulated, nutritious, easily digested diet; and where the mother's breast-milk is either deficient, or poor and thin in quality, the child should be fed with cow's milk, to which some water and sugar have been added, and beef tea may also be administered. If the infant is living in a low, damp, and close locality, it should be removed to a dry, clean, and airy one. The class of medicines employed should be mild aperients and alteratives, as *magnesia*, *rhubarb*, *soda*, or *the tartrate of potash*; the alkaline remedies relieve acidity in the stomach and bowels, and the rhubarb acts as a gentle aperient and tonic. When the infant is pale and flabby, some of the preparations of *iron* may be used with advan-



tage, especially the *citrate of iron*; and when there is a scrofulous tendency, the *syrup of the iodine of iron* may be given, together with *cod-liver oil*, which may be administered in the dose of a teaspoonful once or twice a day, and which infants generally take without any repugnance. In concluding this brief notice of laryngismus stridulus, I cannot too strongly denounce the application of leeches, or any other measures having a lowering tendency, and I repeat, that this disease must not, on any account, be confounded with croup.

#### COUGH OF TRACHEITIS OR CROUP.

Croup is an inflammatory disease, affecting the mucous membrane of the windpipe, sometimes extending upwards to the larynx and downwards to the bronchial tubes. It is a disease which makes rapid progress unless it is promptly and efficiently treated, often destroying the patient by suffocation. It attacks principally children, in which respect it differs from laryngitis, which chiefly affects adults; but it differs also from laryngitis in the important circumstance that whereas in the latter disease there is found, after death, only a general redness and tumefaction of the mucous membrane in most cases, in croup, on the contrary, there is the production of what is called a *false membrane*, consisting of albumino-fibrine or coagulable lymph, blocking up the canal of the windpipe, and thus obstructing the passage of air into and out of the lungs. Laryngitis also, is frequently observed in a chronic state, while croup runs a rapid



course, either controlled by medical treatment, or carrying off the patient, but seldom lasting for any considerable period.

The principal and most remarkable feature observed in croup is the *cough*, and this is so characteristic that the term *croupy cough* is applied not only to the cough which is characteristic of this disease, but to other coughs which bear a resemblance to it. Although this cough is familiar to all medical practitioners and to many mothers, it is not easy to describe it in words. Dr. Copland, in an excellent article on croup in his well-known Dictionary of Practical Medicine, thus describes the cough in croup, although he allows that it scarcely admits of description:—"There is an unusual dry, loud clangous or ringing cough, as if passing through a brass tube; or sometimes resembling the barking of a puppy. The succussions constituting it are followed by a dry, hissing, slow, sonorous inspiration, resembling the sound produced by a piston forced through a dry pump, or by a crowing noise, similar to that emitted by a chicken with the pip." It should be mentioned as a curious circumstance alluded to by the same distinguished author, that croup, identical in its pathology with the disease which occurs in the human subject, occurs also in several of the lower animals, especially before they are fully grown. The "pip" is the name given to it when occurring in chickens, but it has been observed also in horses and dogs, in lambs, in cats, and in cows.



The earliest symptoms of croup are nearly identical with those of a common cold, and the most experienced observer may fail to detect in this preliminary stage the indications of a serious disease. Sometimes this first stage is so slightly marked as almost to escape notice altogether; and the child may awake suddenly with violent fever, difficulty of breathing, and the peculiar loud, hoarse cough already described. This is the period of danger; and when the disease has thus distinctly declared itself, no time should be lost in endeavouring to arrest its progress. Besides the symptoms indicating the local affection, there exist all the signs of inflammatory fever; the pulse is full, quick, and strong, and the skin is hot and dry. The attack generally comes on in the night, and subsides towards the morning and during the day; but the cough still continues, though with less severity, and the pulse continues full and strong. In these respects, croup differs from laryngismus stridulus, for in the latter disease, the remission of the symptoms between the paroxysms is complete. Towards evening the disease, which had been partially lulled during the day, returns with increased severity, and probably after a short sleep the patient awakes with the same violent and characteristic cough, pain in the throat, and difficulty of breathing; and as time wears on, the symptoms still continue to increase, while the powers of the patient begin to diminish, and death by suffocation becomes imminent. In the advanced stages of the disease, attempts are



made to expectorate, but only a small quantity of mucus is expelled ; and sometimes vomiting ensues, with the excretion of some shreds of membrane, the removal of which affords some temporary relief, or even indicates a diminution of the urgent symptoms. At last the strength of the patient is subdued by the struggle with the disease ; the pulse becomes weak and irregular, the breathing is oppressed, the voice is nearly extinguished ; the cough also is less violent, but the exclusion of air from the lungs eventually induces the condition of asphyxia, the venous blood accumulates in the system, and the patient dies of suffocation and exhaustion.

Croup may occur in children who are otherwise healthy and plethoric ; it is more prevalent in cold and moist climates, and during the prevalence of cold winds, than in opposite climates and conditions. There is some reason to believe that it has become more common in modern times than formerly, and at any rate no good description of it appears to have been given before about the middle of the last century. But whether it was then a new disease, or whether it had been previously confounded with other diseases, as suggested by Dr. Copland, it is not easy at the present day to determine.

The pathology of croup is perfectly well understood. It is an acute inflammation of the lining membrane of the windpipe, and although inflammations of mucous membranes in general have a tendency rather to pass into suppuration and ulceration, yet in this particular disease the result is the formation of a tube of coagu-



lable lymph, forming a kind of cast of the cavity of the windpipe, and filling up that organ. The danger of such a formation must at once be obvious, as it closes up the channel through which the air is admitted into the lungs; and the effort of coughing is an attempt made by nature to dislodge the false membrane from the air-passages. This effort is generally unsuccessful, although, as has previously been noticed, the expulsion of shreds of this false membrane by coughing or vomiting, is attended with temporary, and sometimes even with permanent relief.

*Treatment of Croup.*—The pathology of Croup being well understood, and the symptoms very distinct, the treatment is often attended with success. In no disease, perhaps, is the efficacy of prompt and vigorous treatment more distinctly marked than in croup; and the same remarks are applicable here, as I made in describing the treatment of laryngitis, where I denounced the puerility and the wickedness of the so-called system of homœopathy in the case of a rapidly-fatal inflammatory disease. In croup, not only is the interior of the windpipe inflamed, but the inflammation will certainly result in the production of a false membrane, which will suffocate the patient, unless its production is arrested by appropriate remedies. Science has happily put into our hands the means of controlling the morbid action in which croup consists, and our success will depend upon the skill and vigour with which those means are used. Among the most valuable medicines placed



at our disposal, *the potassio-tartrate of antimony*, or *tartar emetic*, holds perhaps the first place, for it not only diminishes the action of the heart and the force of the general circulation, but it seems to act specifically and beneficially upon the mucous surfaces of the respiratory organs when they are inflamed. I was particularly struck with the remedial powers of this salt some years since, when, without any previous symptoms of importance, one of my own children suddenly awoke very early in the morning, with decided symptoms of croup. I immediately procured some tartar emetic, and administered about two grains, the child being about two years old. The effect of the medicine was immediate and decided; the inflammatory symptoms and the croupy cough were suddenly arrested, and the action of the heart was so much lowered, that the child, from being of a florid colour in the cheeks, presented a waxy paleness, and water was sprinkled over her, to stimulate the system to reaction. But the disease, I believe, was arrested at its very commencement; and although the symptoms returned with considerable severity on the next and following nights, and required the subsequent treatment about to be described, yet the disease was kept in sufficient check, and a complete recovery was the result.

The object to be accomplished in the treatment of this disease, is to "knock down," as it is sometimes called, the inflammatory symptoms, and to *prevent the formation of the false membrane*; for when this result has happened, the chances of a successful issue are very



much diminished. Now the tartar emetic, administered in an adequate dose, at once subdues the inflammatory action by lowering the force of the heart and arteries, and this medicine should be given in doses of half a grain to a grain at frequent intervals, so as to keep the system completely under its control. It will probably cause vomiting, but this circumstance is not important. When reaction from the effects of the tartar emetic has commenced, and the pulse is again full and strong, and the skin hot, blood should be abstracted. Bleeding from the arm I have seen practised successfully, even in children born in town; but in general, the application of leeches to the upper part of the chest is to be preferred. The bleeding thus caused will be generally attended with relief of the symptoms; but repeated applications of the leeches are often required, as the pulse recovers its strength and fulness, and the cough and difficulty of breathing return. Another most valuable remedy in this disease is *calomel*, which should be given in doses of two or three grains at intervals of three or four hours. Children bear the administration of calomel exceedingly well, and do not usually exhibit the phenomena of salivation. This mineral has the power of controlling inflammatory action, and what is of great importance, *it prevents the effusion of coagulable lymph*, and when it is effused, *it tends to absorb it*: and hence it is invaluable in a disease like croup, where the greatest danger consists in the formation of a false membrane blocking up the windpipe, and suffocating the patient. After men-



tioning *tartar emetic*, *bloodletting*, and *calomel* in the treatment of croup, there is not much more to be written upon the subject; because these three powerful instruments in the hands of the medical practitioner are sufficient to control the disease. The use of the warm bath, however, in the early stages may be recommended as tending to divert vascular fulness to the extremities from the interior; and when the acute symptoms have subsided, the application of blisters to the upper part of the chest, or to the nape of the neck, *but not to the throat*, may be recommended. During the treatment of croup, food must be entirely withheld; for the constituents of food only afford materials for the aggravation of the disease; and when the danger has passed away, the diet must be unstimulating, though nourishing—change of air, especially from a cold to a warm air, is to be recommended; and children subject to croup should, if possible, be removed altogether from cold and exposed localities.

Before quitting the subject of Tracheitis, I must allude to a form of this disease which I have frequently noticed in adults, differing in its character, in many respects, from the croup of children. It is a kind of subacute inflammation of the windpipe, arising from cold, not attended with the formation of a false membrane, and not terminating fatally, unless neglected or complicated with tubercular disease of the lungs. It is characterised by pain along the course of the windpipe, or in some part of it, sometimes represented by



the patient as resembling the pricking of a pin, at a particular spot. There is *cough*, of a dry, hacking, distressing character, and *ineffective*, inasmuch as it is not followed by any expectoration, and is, therefore, unattended with relief. This form of subacute tracheitis is distinguished from laryngitis by the situation of the pain, and the fact that the voice is little, if at all affected; and from bronchitis by the situation of the pain, the dry cough as distinguished from the humid cough of bronchitis, and by the absence of the physical signs of disease in the bronchial tubes. The treatment of this disease is founded upon the same principles as those described in the treatment of croup; but as this form of tracheitis is not so dangerous as croup, the treatment need not be so active. My usual plan of treating this disease is to apply two *leeches* to the lower part of the neck, and to direct them to be applied again at intervals. The *tartar emetic* is of essential service in this disease, but I do not give it in full doses, but only in the proportion of a sixth of a grain to a dose, frequently repeated. The effect of this medicine, given in this manner, is to cause slight nausea and some perspiration; and by inducing secretion from the mucous membrane of the windpipe, the cough loses its dry, hard character, and becomes moist, indicating relief of the disease. With this treatment is combined the administration of mercury, in a mild form, and in small doses; for instance, a grain of *calomel*, or five grains of *blue pill*, or five grains of *mercury with chalk*, every four or six

hours. This treatment is generally successful, but it should be adopted early, otherwise the complaint may fall into a chronic state, or may become dangerous by the spread of the inflammation to the larynx and the bronchi. In forming an opinion, also, as to the probable result of the case, great care should be taken to examine the chest thoroughly by auscultation and percussion ; because, if there is any serious disease of the lungs, the tracheitis will not so readily yield to treatment, as it is then only an extension upwards of a pulmonary affection, and may, in fact, be caused by the irritation of tubercles. In such a case, the chief attention of the medical practitioner should be directed to the state of the lungs and the improvement of the general health ; not, however, neglecting the local treatment, but modifying it according to the peculiarities of the case.

#### HOOPING COUGH, OR PERTUSSIS.

This well-known affection is characterized by a violent convulsive *cough*, attended by a peculiar noisy and stridulous inspiration. The efforts of coughing are so violent as to induce the appearance of threatening suffocation ; but with the termination of the paroxysm, the symptoms disappear, and the child recovers its ordinary condition. The cough consists of a number of short and painful expirations, followed by deep and long inspirations, and these alternations are repeated for a greater or less period of time, until they conclude by



the expectoration of a small quantity of viscid mucus, and a relief of the suffering. In the ordinary and well-developed form of the disease, and when there are no complications, the complaint is purely a spasmodic one, and in the intervals, the patient suffers little or nothing, and, indeed, appears in its usual state of health.

There are, certainly, two stages of this disease, and some authors have added a third. In the *first* stage the symptoms resemble those of ordinary catarrh; there is a frequent hoarse and hacking cough, with running at the nose, and slight febrile action. These symptoms may continue about a week, and are followed by the fully developed form, or *second* stage of the disease, which is marked by the occurrence of the characteristic *hoop*, and puts the nature of the case beyond a doubt. It must not be forgotten, however, that the hooping noise is occasionally heard in children although they are not suffering from hooping cough, because in these patients the aperture of the glottis is often narrowed by local and constitutional causes, and the entrance of the air through this restricted passage may give rise to the sound in question. But where the disease has been gradually coming on for four or five days, and the paroxysms of cough are frequent, and persistent in their character, the existence of hooping cough may be considered as established. A *third* stage described by some authors is the period of decline, when the peculiar hooping noise is less distinct, or is totally



absent, and the cough resembles again that of a common catarrh, previously to its entire disappearance. In some children the cough continues for a very long period.

Hooping cough, when it occurs in children otherwise healthy, and is free from complications, is not a dangerous disease ; but when it follows measles or scarlatina, or when it occurs in weak and scrofulous children, it is often exceedingly dangerous, and lays the foundation for, or is associated with, fatal affections of the lungs and bronchial tubes, or even with diseases of the brain.

The patients usually attacked with this disease are children from the period of the first dentition to the age of twelve or fourteen ; but adults are occasionally subject to it ; mothers having caught the disease from their children. In adults, the hooping is not so well marked as in children, owing to the greater capacity of the *rima glottidis*, and the greater control over the nervous apparatus by which the calibre of that aperture is regulated. Old persons are not very liable to the disease, although it may occasionally attack them ; and as a general rule (which is, however, not without exceptions) it attacks persons only once in a lifetime.

With regard to the pathology of this disease, or the immediate causes which excite it, it cannot be said that we possess any certain knowledge. As hooping cough is not in itself a fatal disease, very few opportunities have presented themselves for examining the respiratory organs after death ; and in those cases which have been examined, no appearances have been found sufficient to



account for the symptoms during life. I cannot agree with those who regard whooping cough as in any respect an inflammatory affection; for although there may be slight fever at the commencement of the disease, yet during its whole course there is a general absence of acceleration of the pulse, heat of skin, thirst, difficulty of breathing, or any other sign of inflammatory action. I have lately paid very particular attention to this point during an epidemic of whooping cough which has visited several of the younger members of my own family. Indeed, although the paroxysms are most painful to witness, and are attended with distressing feelings of suffocation, yet as soon as the fit is over, the child entirely forgets its former sufferings, and plays and runs about as usual. The termination of the fit is marked by the expectoration of a small quantity of tough phlegm; and if the coughing is unusually violent, it may be tinged with blood, this circumstance having sometimes been regarded as indicating an inflammatory condition of the bronchial tubes: but to me the presence of this phlegm and its ejection appear to be only accidental concomitants, and not essential conditions of the disease. In fact, the collection and the expulsion of phlegm are rather *effects* of the cough than its *causes*, and the phlegm itself is little more than the mucus usually present in the bronchial tubes collected together by the violent action of the respiratory apparatus. In the intervals between the fits, there are no auscultatory murmurs indicating disease of the bronchial tubes.



During the fit itself there is an absence of common respiration; and what is a curious circumstance, the long, stridulous inspiration so characteristic of this disease, appears at first to draw the air into the windpipe, only as far as the bifurcation of the bronchial tubes, where it seems to meet some obstacle before it reaches the lungs. Sometimes, however, the disease is complicated with bronchitis, when the peculiar auscultatory signs of that inflammation will be detected, and the danger of the case is very materially increased.

I incline to agree with those who regard hooping cough as essentially a nervous affection, and therefore analogous to asthma and laryngismus stridulus. In describing the anatomy of the parts concerned in coughing, it was shown that the pneumogastric nerve supplies both the stomach and the lungs, and that some of its branches, particularly the superior and inferior laryngeal nerves, supply the apparatus which opens and shuts, or modifies the calibre of the *rima glottidis*. Now, a knowledge of the reflex function enables us to understand how the irritation of one part or organ may cause disturbance in another part or parts, and it is quite intelligible that irritation of the pneumogastric nerve may excite coughing by acting upon those portions of the nerve which are connected with respiration. It is also intelligible upon the same principles, how irritation of the pneumogastric nerve may induce corresponding irritation in other nerves, as for instance, the phrenic nerve, the intercostal nerves, and the lumbar



nerves, which are all more or less concerned in the violent efforts constituting coughing. I regard hooping cough therefore as essentially depending upon some irritation of the pneumogastric nerve; but it is difficult, and perhaps impossible to explain why this irritation should take place spasmodically, why it should be greater in some subjects than in others, and why, above all, it should present an infectious character. But the same difficulties beset us in studying almost all the diseases of the nervous system.

One circumstance which I have not yet mentioned in connexion with the pathology of hooping cough is, that the termination of the paroxysm is attended not only with some expectoration, but also very frequently with vomiting, so that the patient sometimes ejects its food as soon as it is swallowed. This may be accounted for, either by reference to the compound character of the pneumogastric nerve itself, which supplies both the organs of respiration and the stomach, or by supposing that the irritation of the respiratory organs is propagated by sympathy to those muscles which induce vomiting, namely, the abdominal muscles, which are also, it should be recollected, concerned in expiration.

*Treatment of Hooping cough.*—The pathology of this disease being enveloped in a certain degree of obscurity, it must be confessed that the treatment is, in some respects, unsatisfactory. It is more easy to prove what the disease is not, than what it really is; but even this nega-



tive knowledge is useful in guiding us to sound principles as to its management. In the first place, it should be remarked, that as hooping cough is not an inflammation, it is useless, or worse than useless, to employ active depletory measures, either by bloodletting or purging. But on the other hand, as inflammatory symptoms, although not an essential element of the disease, may supervene during its course, it is advisable not to adopt a stimulant plan of treatment. A middle course of general management must be adopted, and the diet, although not so low as to reduce the powers of the patient, must avoid the other extreme of being too stimulating. With regard to general hygienic arrangements, it may be stated that it is unnecessary to confine children to one room, as was once the case, during the course of the disease, and that the patients may be allowed to go from one room to another, and to pursue their usual pastimes if they please. If the weather should be favourable, even exercise in the open air should not be forbidden. In feeble and delicate children, however, and in those who have lately suffered from epidemic fevers or eruptions, greater precautions should be taken than in those cases where the children are otherwise healthy.

At the commencement of hooping cough, the case may be treated like a common cold, the symptoms of which are generally present; and when the disease has fully developed itself, mild antacid, tonic, and aperient medicines should be administered, the best being the *carbonate of magnesia*, and *carbonate of soda*, and pow-



dered *rhubarb*; of each of which from three to five grains, according to the age of the patient, may be given twice a-day. This treatment often produces a beneficial effect upon the cough, owing, no doubt, to the sympathy existing between the stomachal and the pulmonary branches of the pneumogastric nerve. Lozenges containing ipecacuanha, together with honey, barley-sugar, and syrup of squills, may also be given, although it cannot be said that they have much influence in mitigating the cough; they merely allay the irritation of, and promote secretion from, the respiratory passages. The administration of small doses of *ipecacuan*, either in the form of wine of ipecacuan, or of the powder, a tea-spoonful of the former or a grain of the latter, is generally of service in clearing the air-tubes and windpipe, and is a measure very generally adopted; but it is not advisable to continue this emetic too long, as it lowers the powers of the patient. The same remark is applicable in a stronger degree to *antimonial wine*, which may be given in the dose of ten or twelve drops at the commencement of the disease, but should not be persevered in for any lengthened period.

With regard to the specific treatment of whooping cough, a host of remedies has been recommended by different authorities, and in proportion as the disease has sometimes baffled the efforts of legitimate medicine, so has it called forth a multitude of quack preparations, each of which professes to be an infallible specific. The true remedy, if indeed there is one, ought probably



to be sought among the class of sedatives, the properties of which are to allay irritation, but it is too often found that the disease resists the power of all the sedatives at present known, and runs its course in spite of every remedy which is administered. *Prussic acid* was recommended by Dr. Elliotson, and may be given in the dose of one or two minimis of the pharmacopœial preparation two or three times a-day. *Belladonna* is strongly recommended by Dr. C. J. B. Williams, in the dose of a quarter of a grain three times a-day, to a child of two years old, half a grain to one of four, and a whole grain to one of eight years, the dose being increased if necessary; and he attributes the efficacy of this drug to its sedative effects upon the laryngeal and bronchial nerves and muscles. *Opium* has also been recommended in certain cases by the same authority; but the opiate preparations should be administered to children with very great caution, as these patients are peculiarly susceptible of their poisonous effects. Other remedies have been recommended, and much has been said and written in their favour; thus, *alum* has been frequently extolled by some practitioners, owing probably to its astringent properties. *Nitric acid* has been strongly recommended by Dr. Gibb, who has written a very excellent treatise on whooping cough, and who informs me that the acid in his hands, in combination with other treatment of a general nature, has been very successful. But it is needless to enumerate all the drugs which, with or without reason, have been



proposed for the cure of hooping cough. The popular remedy of cochineal and salt of tartar is not objectionable; the cochineal can do no harm, while the salt of tartar, by its alkaline properties, may be serviceable in removing acidity of the stomach and bowels. *Embrocations* to the region of the spine and chest have often been recommended, and are employed with considerable advantage; and a common preparation of this kind may be compounded of *oil of amber* and *olive oil*, together with some *opiate*. This compound, rubbed in externally in the regions indicated above, may and probably does act as a stimulant and sedative to the nerves supplying the muscles of respiration, and thus it allays the irritation of the cough, and obviates the debility which the cough induces.

After the second stage of hooping cough has been passed, and the spasmodic and convulsive character of the complaint has given place to a troublesome cough of an ordinary nature, the usual remedies of cough may be employed with advantage; but it frequently happens that, while the convulsive and spasmodic characters are still well marked, the powers of the patient begin to decline, emaciation begins, the appetite fails, and the expectoration may even become purulent. Under these circumstances, a tonic and stimulant plan of treatment must be adopted; wine must be given to the patient, and metallic tonics, especially those of *zinc* and *iron*, must be administered. The *citrate of iron*, in the dose of two or three grains, and the *sulphate of*



*zinc*, in the dose of half a grain to a grain, according to the age of the patient, will be found useful; and when there is any scrofulous tendency, the *cod-liver oil* ought to be administered in the dose of one to two teaspoonfuls in the day. When the cough has lasted for a long period, and the child is much exhausted, the paroxysms of cough are sometimes followed by convulsions; but these convulsions are usually of a reflex character, and are not dependent upon any organic affection of the brain; they therefore require the administration of wine and tonics, and will disappear as the patient improves in general health. I well recollect attending the delicate child of a professional friend, in which the paroxysms of coughing were almost always followed by well-marked convulsions passing into an apparently comatose condition; but I found that the best remedy was to open the mouth, and introduce some port wine. This child entirely recovered; an instance among many others, showing the tenacity of life in young subjects, and the necessity of never despairing of a fortunate issue in such cases, while the slightest spark of hope remains.

Among the best remedies for hooping cough, especially after it has lasted for a month or six weeks, and still persists, is *change of air*, which generally, as if by magic, puts an end to the disease. It is not of much consequence whether the change is from a low locality to a high one, or *vice versa*: any change is favourable, and in obstinate and prolonged cases, this remedial measure should never be neglected.



As I have now concluded the history of those coughs which are dependent upon some idiopathic or symptomatic affection of the throat, larynx, or windpipe, and am about to proceed to the consideration of the coughs which are more immediately connected with diseases of the lungs, it becomes necessary to say a few words upon a method of distinguishing pulmonary diseases, which is at present universal among medical men. I therefore now offer some remarks upon

#### THE STETHOSCOPE AS A MEANS OF DIAGNOSIS.

Before the time of Laennec, very little was known of the distinctions existing between the different forms of chest diseases; but since that distinguished author published his *Traité de l'Auscultation Médiate*, the morbid conditions of the heart and lungs are, perhaps, better understood, during life, than those of any other region of the body not exposed to view. But the professional public do not require to be informed that there is nothing magical in the construction or uses of the stethoscope, which has thus unlocked the mysteries of the living human chest; the real fact being, that Laennec taught medical men to make more diligent use of their ears than they had previously done, in the diagnosis of diseases. Laennec's first stethoscope was a roll formed of three quires of paper closely pressed together, but leaving a central channel; and the instrument has since been constructed of wood of various



kinds, sometimes of a massive cylindrical form, sometimes thin and tubular, but always leaving the central canal. The stethoscope which I use myself, and which I believe is employed by most physicians, is formed of ebony wood, of a thin tubular shape, enclosing the central channel, and expanded at one end into a flat disc, where it is applied to the ear of the auscultator, and at the other, into a trumpet-shaped extremity, which is applied to the body of the patient.

The value of the stethoscope was at first supposed to depend upon the acoustic principle, that bodies conducted sound in proportion to their density; but Laennec ascertained practically that bodies of a medium density, such as paper and the light kinds of wood, were the best adapted for the construction of the instrument, which is now almost universally fabricated from the latter material. It is difficult also, on acoustic principles, to understand the exact use of the central canal of the stethoscope, which is of course filled with air, a much less dense medium than the solid which encloses it; and yet common experience proves the value and importance of this kind of arrangement.

After all, the chief value of the stethoscope depends not so much upon the construction of the instrument itself, as upon the tact, skill, and learning of the person who uses it; and a good physician, with a bad stethoscope, or with none at all, will know much more of the existence and progress of thoracic diseases than an indifferent physician with the best instrument in



the world. Its invention has saved no labour to the medical practitioner, but has rather increased it, by widening his sphere of observation, and making him employ another sense in addition to those which he was in the habit of using. He will not be satisfied with the indications afforded by the instrument, but he will, if possible, examine the chest of his patient with his unassisted ear, and compare the results thus obtained with those derived from the use of the stethoscope; and he will seek, with greater diligence than ever, the traces of disease left in the bodies of the dead, as throwing light upon the vital phenomena presented in the thoracic and other organs of the living.

Premising that a very fair diagnosis of chest diseases may be made without the stethoscope at all, this instrument is really valuable on the following grounds. In the case of dirty persons, or those afflicted with contagious diseases, it is inexpedient to approach too closely to the bodies of the patients; and, again, in the case of females, the intervention of the stethoscope is convenient on the score of delicacy. Again, in very thin persons, and where the surface of the body is irregular, from bony prominences, the end of the stethoscope will be able to convey a definite impression of sound in spots where the ear cannot be applied; and in the neck and the cavity of the abdomen, where it is often necessary to localize some arterial and other sounds, it is indispensable. As far as the chest is concerned, the assistance of the stethoscope is very valuable



in pointing out the exact spot where disease is situated in those cases where the morbid action is circumscribed within a narrow space, as is often the case in the early state of tubercular deposition in the lungs, in the softening of tubercles, in circumscribed hæmorrhage, in pulmonary ulceration, and other similar cases.

But Laennec, although popularly known as the inventor of the stethoscope, was really the pioneer, who led the way to an accurate investigation of the diseases of the chest, and, indeed, of other regions of the body. The ancient physicians were too often satisfied with examining the tongues and feeling the pulses of their patients, and making general inquiries into the state of the different functions; but since the time of Laennec, the members of the medical profession have diligently interrogated nature in the most close and stringent manner, and in the exploration of hidden disease have made use of every faculty which they possess. With regard to the diseases of the chest, these labours have been attended with most accurate results; and, although it would be presumptuous and incorrect to affirm that difficulties and doubts are banished from the diagnosis of these affections, yet it may be stated with truth, that the contents of the chest are now made almost as palpable to the perceptions of the physician, by the help of his ear, as they would be if his eye could penetrate its solid walls. Not only may general disease be indicated, or its absence confidently announced, but the very tissue and the very spot affected may be pointed



out with certainty; the passage of the air may be traced to every part of the lungs, and the blood may be traced through all the cavities and valves of the heart. Incipient disease may often be detected when no general symptom exists of its presence, and its progress may be prevented; and even when the morbid action is confirmed, its exact limits may be defined, and remedial measures may be confidently applied.

Although the present section is devoted to the stethoscope as a means of diagnosis, it is necessary rather to consider the indications afforded by this instrument, than the peculiarities of the invention in question; and, actuated by this spirit, which influenced the mind of Laennec himself, modern physicians study the whole of the phenomena presented by the physical examination of the chest. This examination is made in two modes, namely, by striking the *walls* of the chest, and observing the sounds elicited by the *Percussion*; and by listening to the healthy or morbid sounds produced by nature *within* the chest, a method which is known under the name of *Auscultation*. When the naked ear is employed, the auscultation is called *immediate*, and when the stethoscope is interposed, it is called *mediate*. *Percussion* and *Auscultation*, therefore, are the two leading methods for ascertaining the condition of the lungs and heart, and other organs placed within the chest. Without these powerful aids to investigation, the existence of *cough* may denote something wrong within the chest, but it does little more; and it is only by a careful examination



of the chest by the fingers and the ear, aided by the stethoscope, that any definite opinion can be formed as to the source from which the cough proceeds.

The information derived from striking the walls of the chest, or *Percussion*, is founded altogether upon acoustic principles. When an empty cask, that is to say, one filled only with air, is struck on the outside, it gives a hollow sound; but when the same cask is filled with solid or liquid matter, the sound is dull. Thus, in the chest, when the lungs are filled with air, which is their natural condition, they give a hollow sound when the walls of the chest are struck; but, on the contrary, when the lungs, or any part of them, is choked up by solid matter, or pressed by fluid, a dull sound will be emitted, either generally over the whole lung, or over a particular portion of it, according to the nature and extent of the disease. In the healthy condition, percussion over the chest gives generally a clear and hollow sound, except over those parts which are occupied by solid organs. Thus, the sound is naturally dull over the sternum and a little to the left of that bone, because that position is occupied by the heart; and there is also natural dulness over the lower five or six ribs on the right side, where the liver is situated. But if dulness occurs anywhere else, there must be a suspicion of disease. In all doubtful or suspicious cases, the percussion sound should be examined *on both sides* of the chest, because, within the limits of health, there may be differences of percussion



sound observable in different chests, owing to fatness, leanness, muscular development, and other peculiarities. It is only, therefore, by examining the absolute and relative amount of dulness that any correct results can be attained.

For the purpose of examining the sounds produced by percussion, instruments called *Pleximeters* are employed by some physicians. They are made of wood or ivory, of a circular form, and are laid flat upon the chest, while their external surface is struck by the fingers of the observer. For my own part, I believe that such instruments are, generally, unnecessary, and that the best pleximeter is composed of the fore and middle fingers of the left hand of the physician, laid flat upon the chest of the patient, with their palmar surfaces next the skin, while their dorsal surfaces are struck by the fore and middle fingers of the right hand. This arrangement gives very satisfactory results ; and the fingers thus employed may be conveniently and readily applied to any part of the chest which it may be necessary to explore.

The patient who is being percussed, should be undressed, or at any rate should be covered only by some light silk, or cotton, or linen garment ; because a great quantity of clothing will materially modify the sounds produced by percussion, and might lead to erroneous results.

*Auscultation* is employed for the purpose of examining the passage of the air through the lungs, or the passage of the blood through the heart, or the presence of certain morbid secretions, or abnormal growths or conditions in either of those organs.



Before attempting to form any opinion as to the existence of disease of the heart or lungs, every medical man should thoroughly understand the healthy sounds and impulses presented by them to the ear. It should be known that, as far as the lungs are concerned, there are two sounds produced in breathing, namely — the sound of *inspiration*, when the air is drawn in, and that of *expiration*, when it is sent out. Now, the entrance of air into the bronchial tubes, and afterwards into the minute air tubes and cells (see p. 9), is accompanied, in the healthy state, with a gentle rustling sound, like the sighing of the breeze among the leaves of a tree, gradually dying away into silence. This is called the *inspiratory* or *vesicular murmur*, and it is caused by the impulse of the air gradually overcoming the resistance offered to its entrance by the elastic tissue of the lungs, and eventually finding its way through their soft and spongy texture, till it reaches the air-cells. This respiratory murmur is heard during inspiration, and at the termination of this sound, there is another sound somewhat similar, but much less distinct and much shorter, which is the *murmur of expiration*. This latter murmur, although very indistinct over the greater part of the pulmonary tissues, is very clearly heard over the region of the windpipe, and over the bifurcation of the two bronchi. The reason of the distinctness of the vesicular murmur in inspiration compared with its indistinctness during expiration is thus ably explained by Dr. C. J. B. Williams in his article



on the diseases of the organs of respiration in Dr. Tweedie's "Library of Medicine:"—"It is plain that there must be a difference between the sounds of inspiration and expiration. In inspiration air moving with some velocity meets with the resistance of the angles and sides of the tubes and cells which it has to dilate. Here must be sound in the whole passage of the air from the nostrils down to the pulmonary cells. In expiration the motion begins with the lungs; and the air passively yielding to it, there is not motion or resistance enough to produce sound, until by the converging together of the small tubes, the impelled air is gathered into a current in the larger tubes, where, impinging against their sides with its now acquired velocity, it at length produces sound." Hence, then, in examining a healthy chest by auscultation, only the respiratory murmur of inspiration should be generally heard, the murmur of expiration being so gentle as to be almost inaudible; except in the back between the scapulæ, where the large bronchi are situated, and where the expiration is heard to be almost as loud as the inspiration, for the reasons just explained, and where the respiration is therefore called *bronchial*. In placing the stethoscope over the region of the windpipe the expiration is heard as loudly as the inspiration, and this kind of respiration is called *tracheal*. It should be observed that no sound of respiration ought to be heard over the sternum, and a little to the left of it, because the heart occupies that position.



The auscultation of the healthy heart discovers two sounds produced by that organ. This first is a rather long sound, compared with the second, which immediately follows it, and between the second sound and the recurrence of the first, there is a brief interval of silence. It is impossible to describe these sounds in writing; they must be heard in order that their character may be appreciated. They are heard over the sternum, and a little to the left of that bone; but if they are heard more extensively over the chest, the circumstance often indicates disease either of the heart or lungs.

It has been already stated that the natural murmur of inspiration is heard over the greater part of the chest, the sound gradually dying away as the air penetrates into the minute tubes and air-cells, and the murmur of expiration is much less distinct, and often almost inaudible. But if the minute tubes and air-cells are obstructed by any deposit which prevents their permeability, then the air, instead of passing into the extreme tissues, enters only into the large tubes, and passes from them out again into the windpipe. Under these circumstances, the respiratory murmur of health is replaced by the sound which ought to be heard only over the bronchi, and which is therefore called *bronchial respiration*. Now, if this *bronchial respiration* is heard under the clavicles, it usually denotes the existence of tubercles at the apex of the lungs; and if heard at the lower part of the lungs, it may denote inflammation and solidification of those organs, or any pressure upon their



spongy texture, preventing their permeability to air. Hence the occurrence of bronchial respiration is of the highest importance as a diagnostic indication. Again, when a person speaks, and the ear is applied close to his chest, the voice is heard to be muffled, and somewhat indistinct in consequence of the sonorous vibrations being rendered dull by the spongy mass of the lungs ; but if the ear is applied over the windpipe or the large bronchi of a person speaking, then the voice, not being diffused over the lungs, but produced only in the large tubes, and coming directly to the ear, is clear and distinct to the auscultator. This kind of voice, then, is called bronchophony, from *βρόγχος*, the bronchus, and *φωνή*, voice ; and like bronchial respiration, if it is heard in any other part than over the large bronchi, it is usually an indication of disease.

Again, when a cavity exists in the lung communicating with a bronchial tube, the air is heard to enter and to quit the cavity with a loud blowing sound, somewhat analogous to that produced by blowing into an empty bottle. The conditions necessary to produce this sound are the presence of a cavity, and the existence of a portion of lung-tissue between it and the observer's ear. This kind of breathing is called *cavernous respiration*, and when it is distinctly heard, it indicates an excavation or ulcer of the lungs. I am inclined to believe that this kind of respiration is often confounded with bronchial respiration, which it very much resembles, but which indicates a very different patholo-



gical condition. When the stethoscope is placed over such an excavation, and the patient is made to speak, then the voice instead of being muffled, as is usually the case when the healthy lung-tissue intervenes, passes up clear and loud through the stethoscope to the ear, giving rise to the modification of the voice which is called *pectoriloquy*, from the two Latin words, *pectus*, the chest, and *loquor*, to speak.

These are the chief circumstances to be mentioned in connexion with the auscultation of the breath and the voice ; but there are other sounds produced in the chest, which are appreciable to the auscultator, and which denote certain morbid changes taking place within the chest. Some of these are called *râles*, in French, and *rhonchi*, in Greek, and *rattles*, in English, and four of these rattles are sufficiently distinct and well characterized to receive separate designations. It may be mentioned generally, that some of these sounds are caused by the passage of air through fluids of various density, and others by the passage of air through inflamed and narrowed air-tubes.

In the first place, there is a rhonchus which somewhat resembles the crackling of salt upon the fire, or the sound produced by rubbing the hair between the fingers ; this is called the *crepitant* or *crackling* rhonchus, and is most valuable as a means of diagnosis. It appears to be caused by the passage of the air through a viscid fluid in the extreme bronchi and air-cells ; and it denotes sometimes the first stage of pneumonia, and



sometimes the existence of effused blood in hæmoptysis; in all cases it is a most valuable and important sign. The next rhonchus to be described is the *mucous rhonchus*, which resembles the sound produced by blowing air through soapsuds. It is a kind of bubbling sound, and is caused by the passage of the air through a thick fluid contained in bronchial tubes of a larger calibre than those which produce the crepitant rhonchus. When there is a cavity in the lung, communicating with a bronchial tube and containing a portion of pus, or when this latter is contained in an enlarged bronchial tube itself, then the bubbling is of a very distinct and loud character, and is called *cavernous rhonchus*. The mucous rhonchus is heard in acute bronchitis, and the cavernous rhonchus is heard in the advanced stages of tubercular consumption, when there is an excavation in the lung, partially filled with pus, and partially with air. The *sibilant rhonchus*, as its name implies, is a *whistling* sound, and it is caused by the interruption of the passage of air through the bronchial tubes, in consequence of their obstruction by thick mucus. It is one of the indications of acute, and sometimes also of chronic bronchitis. The *sonorous rhonchus* is a snorting or snoring sound, and is caused by the passage of the air through a swelled and inflamed bronchial tube; it is also an indication of bronchitis, both acute and chronic.

The three latter sounds are all heard more distinctly, by causing the patient to *cough*, and except in the case



of the cavernous rhonchus, which is observed in tubercular phthisis, they are to be sought for chiefly at the lower and back part of the lungs, along the chief ramifications of the bronchial tubes.

Besides these sounds which are produced *within* the lungs and bronchial tubes, there are other sounds which, though originating *within* the chest, are *outside* the lungs. Thus, when the two surfaces of the pleura or membrane covering the lungs (see p. 11) are in a state of inflammation, some sounds are produced which are characteristic of that affection or its consequences. The space which is between the two surfaces of the pleura, is occupied only by a small quantity of serum in the healthy state, and, practically speaking, there is hardly any space at all, the two surfaces moving easily upon one another, and appearing to be in apposition. But when the pleura is inflamed, and its secretion is arrested, or when a morbid secretion is thrown out, then the two surfaces, instead of moving freely upon each other, cause during respiration a grating or rubbing sound, which may be distinctly heard by placing the ear or the stethoscope over the affected part. This rubbing or *friction* sound, as it is called, is therefore an indication of the existence of inflammation of the pleura. Now it often happens that during the early stage of inflammatory disease of the pleura, not long after the first invasion of the malady, a small but undue quantity of serous secretion is thrown out between the two surfaces, thus separating them from one another by an appreciable



interval. When this is the case, the rubbing sound is no longer heard, but on causing the patient to speak, the sound of the voice passing through the compressed lung-tissue, and afterwards through the thin stratum of fluid outside, is modified in a peculiar manner, so as to resemble somewhat the bleating of a goat, and hence called by Laennec *ægophony*, from *αἶξ*, *αἶγος*, a goat, and *φωνή*, a voice. By other writers the sound is said to resemble the noise made by the itinerant performers of *Punch*. The best mode of hearing this sign distinctly, is when the patient pronounces some nasal sounds, as in some words beginning with the letter *n*; and my much esteemed *quondam* teacher, Dr. Elliotson, was in the habit of causing the patients who presented the phenomena of *ægophony*, to pronounce several times in succession the words "nine hundred and ninety-nine," by which means the peculiar tremulous or bleating character of the voice was distinctly developed. *Ægophony* is a sign which does not last for a long period, for it is not developed until after the invasion of inflammation of the pleura, and if the disease proceeds either to recovery or to the effusion of more fluid, the sound disappears. The conditions which produce *ægophony* are, inflammation of the pleura and the effusion of a thin stratum of fluid between its opposed surfaces.

Although it does not fall within the scope of the present work to enter at large into the stethoscopic signs indicating disease of the heart, yet a few remarks may be made upon the subject. As I have before remarked,



the auscultation of the heart discovers two sounds of that organ, namely, the first and the second, which are little clicks very characteristic to the physician, though not readily to be described in words. But in certain morbid states of the heart, these healthy sounds are accompanied or replaced by other sounds of a totally different character, and which resemble *blowing*, or *sawing*, or *rasping sounds*, and which were accordingly called by the French, *bruit de soufflet*, *bruit de scie*, *bruit de râpe*, &c. It is now more usual to denominate these sounds, *murmurs*. The presence of these murmurs indicates, 1st, that there is some obstruction to the passage of the blood through valves, as happens when the valves are inflamed or ossified. 2nd, that the blood after passing through one or other of the valves is *poured back*, or *regurgitated*, as happens when the valves, from any cause, do not close sufficiently; and 3rd, from some unnatural condition of the blood, without any disease of the heart, as happens in the disease called anæmia, when the blood is deficient in red particles.

In treating of the pleura it was stated that when its surfaces were inflamed, the opposite sides produced a grating or rubbing noise, instead of moving freely and noiselessly over one another. Exactly the same phenomena are observable in the case of the *pericardium*, or membrane covering the heart. This membrane has within it two opposed serous surfaces which cause no sound in the healthy state; but when inflammation exists, then the motions of the heart cause a *friction* sound over



the pericardium, which denotes that the usually smooth and polished surface are now probably covered with flakes of lymph.

CHEST COUGHS.—THE COUGH OF INFLUENZA.

Influenza is the name given to a kind of epidemic catarrh which, at different periods and in different countries, has affected simultaneously great multitudes of the human race, and has swept off numerous victims; not, however, so much from the direct effects of the disease itself as from the other maladies which accompany or succeed it, or from the debility and exhaustion by which it is followed. The very young and the very old, especially the latter, fall easy victims to its consequences; and even those who are in the prime of life often become seriously damaged in health by a visitation of this complaint. It has been asserted that the disease attacks the inhabitants of the world in a certain succession of years, and it has been supposed that its visitations are in some manner dependent upon meteorological influences, but the evidence adduced in these respects is as yet too much scattered and too loose in its character to be admitted without reserve. It is, however, quite true that the great capitals of Europe, and of other parts of the globe have been periodically visited by this disorder, and that, although somewhat modified in its severity and its universality, it is still prevalent. Of late years, the most severe attack of epidemic influenza in my recollection visited London



in 1833, immediately after the disappearance of the cholera; and the same epidemic influenza reappeared, although in a somewhat milder form, in 1836. From the observations made by a variety of inquirers, it would appear that the epidemic influenza is not dependent upon season or locality, and is therefore due to some mysterious atmospheric condition, the nature of which can only be conjectured; but the common influenza, as now observed, seems to prevail mostly in damp, cold, and wet seasons, and to be immediately caused in great measure by exposure to the weather.

The *cough* in this disease is loud, violent, suffocating, and attended with great pain in the chest; it is accompanied with very little expectoration, and this is only mucous. The pain of this kind of cough is not confined to the interior of the chest, but the muscles of respiration are rendered acutely painful, by the mere violence of the efforts, and even laceration of the muscular fibres may result. There is at the same time running at the eyes and nose, sneezing, pain, heat, and irritation about the mucous passages of the eyes, nose, mouth, and throat; difficulty of breathing, pain and aching in the head and all the limbs, the pain being particularly severe across the forehead and over the chest; the taste and smell are impaired or absent; the skin is warm, but there is usually copious perspiration; the bowels are generally costive, the tongue covered with fur, but moist, and there is little or no thirst. The pulse is not increased in force or frequency.



At the invasion of this disease it may sometimes present to the casual observer the appearance of fever, but from this affection it is distinguished by the moist skin, the moist tongue, the moderate pulse, and the absence of thirst; from bronchitis, which it also resembles in some respects, and with which indeed it is often associated, it is distinguished by the absence of inflammatory symptoms, and of the auscultatory sounds indicative of inflammation of the bronchial tubes. In a simple case of influenza, notwithstanding the cough and difficulty of breathing, and the violent pain in the chest, the respiratory murmur may be natural, and there are few morbid sounds in the bronchial tubes, or in any other part of the lungs. During the course of influenza, however, the chest should be frequently and carefully examined, because inflammation of the pulmonary organs is very apt to supervene. In an uncomplicated case of influenza, the severe symptoms do not continue long, and in a few days the patient is convalescent, although great debility generally follows the attack.

Among the remote causes of influenza, besides the meteorological or electrical phenomena of the operation of which as yet we know very little, may be enumerated varying conditions of the weather, especially the sudden breaking up of a fine season, and the accession of cold and wet; the spring and winter months are those in which this disease most prevails. It appears to be epidemic, but not contagious; although the fact that many members of the same family are often attacked



by it might lead to the suspicion of its contagious character. But it will generally be found that it attacks a family all at once, and not in succession, as is usually the case with contagious maladies. The immediate cause of influenza, or in other words, its actual nature, cannot be determined with much precision ; but the disease is probably produced by some influence acting upon the nervous system, manifesting itself particularly about the mucous surfaces of the mouth, throat, nose, and lungs. As a very small number of persons die immediately of influenza, few opportunities have been afforded for the examination of the bodies of those who have suffered from it ; and in the cases where examinations have been made, nothing satisfactory has been found to account for the symptoms during life.

*Treatment of Influenza.*—The treatment of influenza in its milder forms is quite analogous to that adapted to a common cold, which it very much resembles. The patient should remain indoors, should keep himself warm, take a little mild aperient medicine, and promote perspiration by warm drinks. Some years since, Dr. C. J. B. Williams recommended abstinence from all fluids as the best remedy for colds, as being likely to stop the excessive running at the nose and the undue secretion from other parts of the mucous membrane ; and I believe that there are some who still adopt this method of medication. But I think that the treatment in this case is worse than the disease ; and that as a cold will get well as soon under the usual and more agreeable



method, the old plan ought to be preferred. Even in the more violent forms of influenza, the medical practitioner ought not to interfere too much, because the period of invasion is soon followed by depression, and this result is favoured by lowering treatment. Bleeding is hardly ever necessary in this disease, and would be likely to prove injurious, for the reason just indicated; but the administration of a single dose of an active purgative, consisting of five grains of *calomel* and five of *colocynth*, is very beneficial, by clearing out the bowels, and obviating any tendency to the development of feverish or inflammatory symptoms. The other treatment may consist of giving repeated doses of some mild diaphoretic and cooling mixture, composed of *spirits of nitric ether*, solution of *acetate of ammonia* and *camphor mixture*, holding in solution either the sulphate of magnesia or the tartrate of potash. If the cough should continue violent, *ipecacuan wine* may be administered in mild doses, or a linctus may be given occasionally, consisting of *syrup of poppies* and *syrup of squills*, in the dose of a teaspoonful of each, when the cough is particularly distressing. If great restlessness and want of sleep should continue, the preparations of *henbane* or *hemlock* may be used with advantage: and if the cough should present a convulsive character, *hydrocyanic acid* may be given in the dose of five minims of the pharmacopœial preparation. Medicines containing opium should not, as a general rule, be employed in influenza; but when the acute symptoms have passed



away, and cough and restlessness remain, the *paregoric elixir*, or compound tincture of camphor, may be ordered with any of the preceding.

The *diet* in influenza should not be too scanty, because this is a disease followed universally by depression, and it is necessary to support the strength; nor should it be too stimulating, because there is danger of inflammation during the progress or after the attack of the disease. A middle course is therefore to be adopted: beef-tea, veal-broth, mutton-broth, milk, eggs, tea, may be given freely, and when the first acute symptoms are subdued, wine and water may be taken. When the disease has passed away, great debility is often left, quite disproportionate to the violence or the duration of the symptoms, and proving the epidemic and nervous character of the malady. It then becomes necessary to support the strength with wine, meat, and beer; and to give *quinine* with or without *iron*, according to circumstances, until the health is quite re-established.

#### THE COUGH OF HAY-ASTHMA.

Hay-asthma is very similar in many of its characters to epidemic influenza; but it does not attack whole communities and families, selecting rather certain individuals who are predisposed to its visitations, and whom it affects on repeated occasions. Unlike influenza, which is sometimes epidemic in all or any seasons, or which, in its ordinary form, is most prevalent in winter and spring, Hay-asthma prevails during the period when the grass



has grown, and while it is being converted into hay. The disease is supposed, and not without reason, to be caused by the irritation of the particles of the pollen of the *anthoxanthum odoratum*, the grass which gives its odour to new made hay, upon the mucous surfaces of the nose, mouth, and lungs; for if persons predisposed to this disease avoid the grass-growing part of the country and resort to the sea-side, they may and generally do escape the attack.

The disease is marked by great irritation and itching of the nose and eyes, with immoderate sneezing, and a violent *cough*, attended with little expectoration. The pulse is not accelerated; there are no morbid sounds in the chest; and the general functions of the body are not impaired.

*Treatment of Hay-asthma.*—As this is a nervous disease, accompanied and followed by general debility, and generally attacking delicate subjects, it is clear that a lowering plan of treatment is out of the question. The *cough* should be allayed by some of the stimulant expectorants, as *squills*, *ammoniacum*, the *balsams of Tolu and Peru*; *quinine* should be administered in considerable doses; and *arsenic* may also be employed in aggravated cases. But the best remedy for the inordinate sneezing, one which was suggested to me by my friend Dr. Parkes, and which I have often found very efficacious, is the *oil of cubebs*, of which ten drops may be taken two or three times a-day on a lump of sugar. The general strength must be supported by bottled porter, port-wine, and meat diet.



## ASTHMA

is a disease of the lungs of which I shall write very little; because, however interesting it may be in its anatomical and pathological relations, it is not attended with *cough*, and, therefore, does not fall within the scope of the present work. Asthma is a disease which depends upon a sudden and spasmodic contraction of the muscles surrounding the bronchial tubes (see p. 7), and is a nervous complaint, like whooping cough and laryngismus stridulus: it is attended with violent difficulty of breathing, but not with cough. The paroxysms of asthma usually come on in the night; the patient starts out of bed, with a sensation of great difficulty of breathing and of impending suffocation; he perhaps runs to the open window to obtain more air; he rests his hands upon some solid body to assist the muscles of respiration; and after a period of suffering, more or less prolonged, he is able to breathe, and becomes perfectly well. The disease depending upon a constriction of the muscular fibres of the bronchial tubes, as soon as these fibres are relaxed, the disease ceases.

In its pure form, it is not marked by any connexion with organic disease of the heart or lungs; but this complication is so frequent, that cases of pure asthma are comparatively very rare. The term *asthma*, as used in common language, implies almost any disease attended with cough and difficulty of breathing, and



many of the diseases of the lungs assume an asthmatic character, especially bronchitis; and this character is so well marked that Asthmatic Bronchitis is one of the most common forms of the latter disease, especially in old persons. In phthisis also, the asthmatic character is often exceedingly well marked, and persons in early and middle life, who are subject to asthmatic paroxysms, will often be found to be the subjects of chronic tubercular disease of the lungs. But disease of the heart and its valves is also a very common cause of asthma, and the condition of these parts should always be carefully examined in persons liable to asthmatic paroxysms; still, in the language of science, asthma is a nervous affection, unattended with organic disease or inflammation, transient in its character, but likely to return by exposure to the exciting causes. These causes are sometimes apparently trifling, such as the presence of particular odours; and often the disease is induced by peculiar states of the general health, and is removable by the withdrawal of the morbid conditions which gave rise to it.

#### THE COUGH OF BRONCHITIS.

Bronchitis is a disease which attacks the young, the old and the middle-aged, and varies in severity, from a rather trifling complaint, hardly more important than, and not very distinguishable from, a common cold, to a fatal and devastating scourge. This disease is clearly divisible into two varieties, the *acute* and the *chronic*, the



first of which was formerly confounded with pneumonia and pleurisy, and indeed with all other inflammatory affections of the chest; and the second was called generally by the popular name of *Asthma*, which comprehended nearly all chronic chest diseases. Bronchitis, as the name implies, is an inflammation of the mucous membrane of the bronchial tubes. The condition of these tubes in inflammation, may be explained by reference to the visible appearance presented by the inside of the nose and back of the mouth in a severe cold: the mucous membrane is red and swollen, and throws out an undue secretion of mucus, and this is precisely the case with the mucous membrane of the bronchial tubes in bronchitis.

*Acute Bronchitis* is marked by violent *cough* on the slightest exertion; the cough is hard, tearing, and painful, and attended with a copious expectoration of frothy mucus. There are also present all the symptoms of inflammatory fever; the patient has shivering, followed by heat, and when the disease is fully developed, there is a quick and full pulse, thirst, heat of skin, want of appetite, furred tongue, tightness across the chest, and great difficulty of breathing. The cough is almost always worse in the evenings, when the expectoration is also more abundant. In addition to these general symptoms, the physical examination of the chest indicates the exact nature of the disease. The percussion on the walls of the chest does not elicit any particular or obvious dulness, because all parts are affected alike,



and because the air-cells are not obliterated. But on auscultation, it is found that the respiratory murmur is deficient, and there are sibilant and sonorous rhonchi in all parts of the chest, owing to the thickening of the air-tubes from the inflammation, and the consequent narrowing of the passage for the air. Subsequently, in addition to these *rhonchi*, or *rattles*, or *râles*, as they are called, there is mucous rhonchus, owing to the passage of the air through the mucus, and the sound of which, as before observed, resembles the noise caused by blowing air into soap and water. The nature of the general symptoms, the loud cough, the difficulty of breathing, the copious mucous expectoration, and, above all, the presence of sonorous, sibilant, and mucous rhonchi in the chest, prove, beyond a doubt, the existence of bronchitis.

The causes of bronchitis are those which produce common colds, or influenza; namely, variable conditions of the weather, and especially wet and cold seasons; and exposure to these vicissitudes in persons who are otherwise predisposed, will give rise to the disease. Young children are very liable to acute bronchitis, which carries off a great number of the infant population; but adult persons, who are much exposed to the weather, also suffer frequently from the disease. Old persons are also very subject to bronchitis, but in them it usually assumes the asthenic and chronic form.

The pathology of acute bronchitis is perfectly well understood. Examinations of the body, made after



death, in fatal cases, show that the mucous membrane of the bronchial tubes is red and swollen, although, in consequence of the emptying of the arterial system just before death, the redness is by no means so remarkable as might be expected. The lungs occupy a very great bulk, owing to their being congested with blood and serum, and the bronchial tubes are filled with frothy mucus, which runs out freely when an incision is made into them.

*Treatment of Acute Bronchitis.*—The treatment of the *cough* of acute bronchitis does not consist in any remedial measures directed to allay this symptom by itself, but in the vigorous application of means to subdue the inflammation on which the cough depends. Therefore, if the patient is of a moderately vigorous constitution, and the pulse is full and strong, blood should be drawn from the arm, to a considerable amount ; or if this measure should not be advisable, leeches should be freely applied over the chest, or blood should be withdrawn by cupping. By such means, the vascular congestion will be much relieved, and the general inflammatory symptoms will be reduced. After the bleeding, and in certain cases, instead of it, the *potassio-tartrate of antimony*, or tartar emetic, may be given in repeated doses of one or two grains, in some diaphoretic mixture. This salt possesses an extraordinary power of reducing the action of the heart and arteries in general, and of relieving inflammatory conditions of the pulmonary mucous membrane in particular, and when the



symptoms are not very severe, or the patient very plethoric, its administration may supersede the necessity of bloodletting. In young children, who are very subject to acute bronchitis, two or three leeches should be applied to the chest, and applied again if the symptoms should not subside; and the *tartar emetic* should be administered to them in small but repeated doses. In all cases, whether of adults or children, the employment of *calomel*, in repeated doses, should accompany the other measures. In children, one to two grains, according to the age, and in adults, three to four grains, should be given every three or four hours. Children bear the administration of calomel exceedingly well, but in adults its effects require to be watched, and when symptoms of salivation begin to manifest themselves, the calomel should be discontinued. The appearance of salivation, provided it is not carried too far, I regard as a most favourable indication in the treatment of acute diseases of the respiratory organs, and, indeed, in most forms of acute inflammation; for this manifestation proves that the calomel is acting upon the system, and with the appearance of salivation, which, although troublesome, is not dangerous, the acute disease, which is dangerous, and often fatal, generally disappears.

I firmly adhere to this view, notwithstanding the opposition which the practice has encountered of late years by some able professional disputants, not, of course, including the homœopathic and other quacks, who defend their practice by no arguments at all, except those



based upon the lowest empiricism. I have had occasion to observe several fatal cases which I feel convinced might have been saved by judicious treatment; but I have never seen one where the timely and proper adoption of antiphlogistic remedies, including calomel, in acute diseases, has done any harm.

With regard to the diet in acute bronchitis, it must, of course, be very light. Water only, or toast and water, or weak tea, or barley water, can be allowed as drink; and food must be withheld. As the disease begins to subside, weak beef tea, or veal broth may be given; but it is not until the inflammatory symptoms have entirely passed away that the patient can be permitted to resume his ordinary diet.

If the cough should continue after the progress of the disease has been checked, it should be treated in the manner already indicated as applicable to cases of simple cough, or the cough of influenza; but, if the case should merge into chronic bronchitis, it must be treated on the principles hereafter laid down.

*Chronic Bronchitis*, although essentially the same disease as acute bronchitis, inasmuch as they both depend upon an inflammatory condition of the bronchial tubes, yet presents such a marked difference in its general aspects as to require a separate explanation. Acute bronchitis attacks the very young and the middle aged; chronic bronchitis attacks the middle aged, but most especially the old. I believe that whereas acute bronchitis destroys a great number of young children, chro-



nic bronchitis is the most fatal disease of the aged. Chronic bronchitis is marked by a teasing, noisy *cough*, most prevalent in the winter, and attended with copious expectoration, which is sometimes frothy, but is also very frequently of a semi-purulent appearance and of considerable tenacity. The symptoms of inflammatory fever are usually wanting, but in their place there is often dyspepsia, marked by flatulence, pain at the epigastrium after meals, and irregularity of the bowels. The *cough* is often of a spasmodic or asthmatic character, very much aggravated by certain conditions of the weather, as by fogs, cold, and rain, and accompanied by disordered states of the stomach and bowels, and it is more severe by night than by day. The pulse is generally moderate in force and frequency, and the tongue may be clean; there is no thirst, and the appetite may not be much impaired, although, as has just been stated, digestion may be difficult. The physical examination of the chest develops the same signs as those described in the case of acute bronchitis; and as the thickening of the bronchial tubes, and the narrowing of their calibre, together with the presence in them of mucus, or pus, are now confirmed and long continued, the physical sounds endure much longer, and return much more frequently than in the acute disease.

The examination of cases where death has occurred from chronic bronchitis, exhibits the morbid conditions of the bronchial tubes in a more marked degree than is observed in the acute disease; because, in



chronic bronchitis, from the frequency and the length of the attacks, the textures of the bronchial tubes are permanently altered. The lungs, therefore, are voluminous, and the bronchial tubes are visibly thickened, and the mucous membrane is of a dark red colour and congested appearance, and there are long red lines or streaks along the course of the tubes. Frothy mucus or pus, or both, are found everywhere in greater or less quantity, and the tissue of the lungs is infiltrated with serum and blood, and presents a dark purple appearance.

Chronic bronchitis may last for a very long period, and is very common in the aged, who perhaps eventually sink under it; indeed, there are but few old persons who have not, at some period or another, suffered from this disease. When, therefore, it is not complicated with any other affection, and if it has not induced any organic alteration of the heart, (which, however, is often the case,) it can hardly be said to be a dangerous disease, although the older the patient is the more serious will the disease become, because the term of human life is itself nearer to its completion. It is, however, a very troublesome and distressing complaint, is often, and indeed generally, associated with congestion of the abdominal organs, especially the liver, spleen, and kidneys, and is frequently followed by alteration in the dimensions of the bronchial tubes, with rupture of the air-cells, and with organic diseases of the heart. The convulsive and spasmodic character which chronic



bronchitis often assumes, causes it then to resemble asthma in some particulars (see p. 106); and the common name asthma, indeed, is popularly applied to chronic bronchitis. But asthma differs from chronic bronchitis in the fact, that there is no cough in the former disease, and there is an absence of inflammation of the bronchial tubes; pure asthma, which however is rare, being entirely a nervous affection.

The worst cases of chronic bronchitis are those where the pulse is feeble, the difficulty of breathing great, the respiration hurried, the countenance bloated, the eyes bloodshot, the lips, tongue, and fingers blue and livid; a state, in fact, resembling *asphyxia*, where the blood, in consequence of obstruction to its passage through the lungs, is not oxygenated, and becomes a poison, instead of a source of life, to the whole system. In such cases, too, it is probable that the expectoration may be very scanty, although the quantity of mucus in the bronchial tubes is very great, another serious circumstance, because it indicates want of power on the part of the patient to throw off the superabundant secretion. In other cases, again, when the attacks have been severe, frequent, and protracted, where the patient is very old, or otherwise very feeble, the powers of life may begin suddenly to fail; the pulse may become intermittent, or very feeble, and the expectoration scanty, although auscultation discovers abundant rhonchi in the lungs; the appetite may entirely fail, and the brain may begin to be affected, and the mind to wander. All these are very dangerous



symptoms, and usually indicate a fatal termination of the disease.

*Treatment of Chronic Bronchitis.*—The treatment of chronic bronchitis is often very satisfactory, and even when the age of the patient is much advanced, and the attacks have been very frequent, a perfect cure may sometimes be effected, as all medical men have occasion to observe. In the first place, if the patient presents a bloated appearance, with purple colouration of the face and lips, and much shortness and difficulty of breathing, I administer an emetic of *ippecacuanha* in the dose of twelve to fifteen grains in some gruel, and I direct this to be repeated in a day or two. Copious vomiting generally ensues, with great relief to the lungs, diminution of the bloated appearance of the face, and general alleviation of the symptoms. The relief thus afforded by an emetic, in chronic bronchitis, is an instance of the sympathy existing between the stomachal and pulmonary branches of the pneumogastric nerve. If the disease is rather of an asthenic character, however, as indicated by a pale appearance, and the patient is otherwise weak and exhausted, the emetic plan is not to be adopted, but mild stimulating expectorants and tonics should be preferred. In certain cases of chronic bronchitis, the powers of the patient are so much reduced, either by the disease itself, or by concomitant or previous derangements of the system, that powerful stimulants are necessary to support the strength, and enable the lungs to throw off the disease. In such cases the



*carbonate of ammonia* should be administered in five-grain doses, repeated at intervals, with perhaps some wine and water, or even brandy and water. This plan rouses generally the powers of the system, stimulates the bronchial tubes to contract, helps to promote expectoration, and thus to restore the healthy functions of the lungs. In many cases of asthenic bronchitis, the *decoction of senega* is an excellent stimulating expectorant.

In all cases, the state of the liver, stomach, and bowels should be carefully regulated, and as these parts are generally more or less affected, a mild aperient should always be prescribed. Where the liver is torpid, and the digestion impaired, a few grains of *blue pill*, with the same quantity of the *compound rhubarb pill*, should be administered to stimulate the biliary secretion, and unload the bowels; and in all cases, some of the mild aperients, such as *castor oil*, or the saline laxatives, should be recommended. The specific treatment applied to the lungs should consist in the administration of sedatives and expectorants, and in the use of counter-irritation. Among the sedatives, one of the best is *hyoscyamus*, which may be administered either in the dose of twenty minims of the tincture, or of five grains of the extract; *conium* is also a remedy of the same class, and may be given in the dose of three or four grains, especially with the addition of small doses of *ippecacuanha*. *Opium* is generally to be avoided in the treatment of chronic bronchitis, because it increases the congestion,



and while it allays the symptoms, it really aggravates the disease; but where the congestion has been removed, and the disease presents an asthenic character, with a harassing cough and great restlessness, the *tinctura camphoræ composita*, or Paregoric elixir, may be given with great advantage, in the dose of half a drachm to a drachm. The opium in this preparation being combined with camphor and benzoic acid, exercises a soothing effect upon the system, while, at the same time, the compound acts as a gentle stimulant to the bronchial tubes. *The ethereal tincture of lobelia inflata* is a sedative which is much esteemed in the treatment of chronic bronchitis, but it should be employed with caution, owing to the uncertainty of its operation. The best expectorants are *ipecacuanha*, *squills*, *ammoniacum*, and *the balsams of Peru and Tolu*; to which may, perhaps, be added some of the foetid gum-resins, as *assafœtida* and *galbanum*. An excellent preparation in the treatment of the cough of chronic bronchitis, is the *compound squill pill*, which contains squills and ammoniacum; and *ipecacuanha* in small doses, especially combined with conium, as I before mentioned, is of great service. The use of counter-irritants is also of great importance; mustard poultices may be applied to any part of the chest to allay urgent local distress, and, in the course of the complaint, after the congestion has been relieved, a blister may be applied to the chest with advantage, and repeated if it should be necessary. Stimulating liniments also to the chest afford great relief, and may be



composed of various ingredients; one of the best preparations of the kind is one much recommended by Dr. Copland, consisting of *compound camphor liniment*, *oil of turpentine*, and *olive oil*; this is either rubbed into the chest and back, or it is spread upon flannel, and laid over the whole of the front of the chest. When the cough presents a spasmodic character, with general depression of the vital powers, I have found great benefit from the employment of Hoffman's anodyne, the *spiritus ætheris compositus*, which may be administered at intervals, in the dose of half a drachm.

The diet in chronic bronchitis must be carefully regulated, for although entire abstinence is not to be enjoined, as in the acute disease, yet much discrimination will be required as to the quantity and quality of the food allowed, and the period of taking it. Generally speaking, the food should be light and nourishing, consisting of beef-tea, chicken broth, veal broth, white fish, rabbits, and chickens; and if any meat is allowed, it should be well-boiled mutton. When the disease has lasted a long time, and if the powers of the patient are becoming exhausted, even stimulants must be employed; and white wine and water, or weak brandy and water may become necessary. If there should be any diminution of the urinary secretion, or any difficulty in passing it, or any symptoms of passive dropsy should make their appearance, then gin and water may be administered, in combination with such medicines as are known to act most readily upon the kidneys.



The patient who is subject to attacks of chronic bronchitis should avoid, as much as possible, cold and wet and foggy weather; during the winter, he should keep the house, and preserve an equal temperature; he should be very careful of his diet, because errors in this respect may bring on or aggravate an attack of his complaint, and he should take care that the stomach and bowels are kept in proper order, and that the biliary secretion is sufficient.

#### THE COUGH OF PNEUMONIA.

Pneumonia is an inflammation of the *substance of the lung*, that is to say, of the structures lying *between* the air tubes and cells, while bronchitis is an inflammation of the air tubes. Pneumonia frequently attacks the young and the middle-aged, and is with them as prevalent as bronchitis, with which it is often associated; it also occurs in advanced life, but is by no means so common in old persons as bronchitis, particularly its chronic form. Pneumonia is characterized by *cough* of a painful character, but not so loud and tearing as in influenza and bronchitis, and not so agonizing as in pleurisy; indeed, in some few cases of pneumonia the cough may be very slight, or, from the supervention of cerebral symptoms, may be unnoticed. There are besides, the usual symptoms of inflammatory fever, shivering, heat of skin, head-ache, foul tongue, thirst, nausea, and loss of appetite. The pulse is full and rapid,



the secretions scanty, the urine high-coloured. The special symptoms connected with the chest consist, first, of *cough*, accompanied by expectoration of a peculiar appearance, for it is thick, tenacious, rust-coloured, and voided in rounded masses, which adhere to the sides of the vessel into which it is discharged. There are also difficulty and pain in breathing, with acceleration of that function, and there is local pain in some part of the chest, but not of so acute a nature as in pleurisy, having rather a dull, heavy character; and, what ought not to be forgotten, the pain may in some cases be absent altogether. Pneumonia consists in the first place of great congestion of the capillary vessels which supply the minute structures forming the substance of the lung; and as the inflammation increases, albumino-fibrine, or plastic lymph, is thrown out into the pulmonary tissue, giving to the organ, or to a part of it, a solid character instead of its usual light and spongy consistence. This solidification of the tissues either diminishes and gives place to a healthy state, as in cases of recovery, or it is followed by an effusion of purulent matter, or the formation of abscess, or even the occurrence of gangrene.

Pneumonia is, therefore, divided into three stages: 1st, *The stage of congestion*, when the lung is infiltrated with blood and serum, increasing its bulk and weight. 2nd. *The stage of consolidation*, called *Hepatization*, from *ἥπαρ*, the liver, because the lung then presents an appearance resembling liver; and 3rd, *The stage of purulent*



*infiltration*, when the lung-tissue is permeated by pus. Now, as the general symptoms of these different stages are not at all to be relied upon as diagnostic indications, it becomes necessary to examine the auscultatory phenomena which they respectively present, and these are found to be very characteristic of the nature and progress of the disease. In the first, or congestive stage, the chief indication is the *crepitant rattle*, or noise like the crackling of salt upon the fire, and which is heard over the affected part. In the second stage, when the lung is solidified, there is dulness on percussion over the solidified portion, and, on applying the ear or the stethoscope, neither respiratory murmur nor crepitant rattle is heard; but, in their place, the breath is heard in the large bronchial tubes only, causing *bronchial respiration*, a phenomenon produced by the obstruction of the smaller tubes and the cells, and the transmission of the respiratory sound through the now solid lung-tissue. In the third stage, when the lung begins to break up, and pus begins to form a number of little abscesses, or passes into the bronchial tubes, there is a mucous gurgling sound, caused by the passage of the air through the purulent infiltration.

Pneumonia is often complicated with bronchitis, with pleurisy, and with pulmonary consumption, and the symptoms will be modified by the addition of those which are characteristic of the other diseases.

A very insidious and fatal form of pneumonia is that which has been called *typhoid*, and which attacks old



persons, and others suffering from depressing influences, such as fever, privation, miasmatic exhalations, and other similar causes. In this form of disease the general symptoms of pneumonia may be very obscure or absent; the cough is, perhaps, slight, and may be wholly unnoticed by the patient, and there may be no pain in the chest. An inattentive observer may, therefore, overlook the existence of pulmonary disease, but a close examination will detect acceleration of the breathing, and a rapid state of the pulse; while by listening to the chest there will be found dulness over a great part of one of the lungs, or, perhaps, of both, and bronchial respiration and bronchophony over the same parts. In this form of pneumonia, the tongue is foul, there is thirst and loss of appetite, and there is usually delirium; and the fact that the brain is functionally involved explains the inattention of the patient to the serious disease which exists in his chest. It is generally found that the feeling of pain is diminished, or even obliterated by the existence of typhous disease, which is accompanied by delirium. I have many times known patients suffering from solidification of the whole of one lung, to be totally unconscious of the existence of any serious disease, but the post-mortem examination has shown the correctness of the diagnosis.

Pneumonia is distinguished from bronchitis by the peculiar symptoms and auscultatory signs just described, by the rusty expectoration, and by the absence of sonorous, mucous, and sibilant rattles in the chest; the pain



also is not so violent as in bronchitis, and the cough is not so loud. From pleurisy, pneumonia is distinguished by the cough in the latter being attended with rusty expectoration, while in pleurisy, the cough is dry; by the pain being more acute in pleurisy, and by the auscultatory signs, which will hereafter be described when treating of the latter disease.

*Treatment of Pneumonia.*—The treatment of pneumonia has undergone a great number of changes during late years; it was treated by Laennec with great success, by the administration of large doses of tartar emetic; some twenty years ago it was the custom to bleed largely in all the cases which would bear it; but in the present day bleeding is not so often practised, and some are even disposed to think that antiphlogistic treatment is unavailing or injurious. My own opinion is, that the type of pneumonia, like that of many other diseases, has changed of late years, and that patients will not bear bleeding so well as they did at former periods. During my pupilage I bled a great number of persons, under the direction of my medical instructors, and I afterwards did so upon my own responsibility in a large public practice, and I cannot call to mind any cases where the results were not satisfactory. Of course, it may be said that the patients recovered in spite of the treatment, and not in consequence of it; but I cannot come to that conclusion when I recollect the immediate and marked benefit which resulted from the adoption of this measure, and the perfect recoveries which gene-



rally ensued. If the same mode of treatment is not so successful at the present day, I believe the cause to be, that disease has now a tendency to run rather into the low and depressing forms, than into what may be called the high or sthenic forms; and that therefore the treatment, generally speaking, ought, in the present day, to be rather of an alterative or supporting character. I never was more struck with the difference existing in the treatment of disease, and, as I believe, in its type, than when I had occasion for some months to attend the practice of the London Fever Hospital. In that institution, which was at first (I speak of some twenty or thirty years ago) situated in a low, crowded, and unhealthy neighbourhood, the patients were generally bled largely, and were otherwise subjected to lowering treatment, and the results were quite satisfactory, as was proved by the frequent recoveries which took place; but at the present period, when the patients are situated in an almost palatial residence, isolated, clean, lofty, and well-ventilated, they will not bear depletion, and they are actually never bled at all, and even a leech is hardly ever used in the institution. The present accomplished and experienced physicians of the establishment, Dr. Tweedie, and Dr. Southwood Smith, have been in the habit of treating fever and its complications for a great number of years, both in the old and the new buildings, and I do not believe that their former plan of bleeding, and otherwise lowering the patients, is in any way inconsistent with their pre-



often fatal, and its treatment requires the greatest discrimination.

Pneumonia, if complicated with bronchitis, or with pleurisy (pleuro-pneumonia) requires exactly the same treatment as in the uncomplicated variety; but when associated with tubercular phthisis, which is often the case, the aspect of the disease is most alarming. In such cases, only a few leeches can be applied over the affected part, and small doses of the tartar emetic may be prescribed; but mercury must be forbidden, as it is highly improper in the treatment of tubercles, and may accelerate the progress of the disease. The regulation of the diet is also most difficult, and requires the utmost caution, for if too depressing a system is adopted, the increase of tubercles is promoted, whereas if stimulants are too freely allowed, the inflammation is increased.

Thus it will be seen that the treatment of pneumonia is very different according to its nature, the subjects whom it attacks, and its complications with other diseases; and this diversity of treatment may be explained upon rational principles. Those who contend dogmatically that pneumonia should be treated always with depletion, and those who maintain that it should be combated by stimulants, are both right and both wrong; the true method of medication consists in a careful study of all the features of the case, and the adoption of measures which are calculated to be serviceable in the peculiar conditions which the malady may happen to present.



## THE COUGH OF PLEURISY.

Pleurisy is an inflammation of the membrane which covers the outside of the lungs, and is reflected over the inside of the walls of the chest. It is characterized by a *cough* which is hard and dry, being unattended with expectoration, but accompanied by great and often excruciating pain. It must not, however, be forgotten that since the discoveries of Laennec have made us acquainted with the auscultation of the chest, the fact has been ascertained that pleurisy, like pneumonia, may sometimes run its course without the ordinary symptoms of pain and cough. These, however, are exceptional cases, and, as a general rule, dry, painful cough, acute pain in the side, much increased by respiration, and shortness of breath, are among the most common symptoms of pleurisy. There are also the ordinary signs of inflammatory fever, and the pulse is full, strong, and *hard*, the latter being an important character denoting inflammation of a serous membrane. There is no expectoration in the pure form of the disease, but if it is associated with a little bronchitis, as it frequently is, there is a scanty discharge of white frothy mucus with the cough.

The exact nature and seat of pleurisy are well understood; the disease consists of an inflammation of the pleura, the natural and ordinary serous secretion of which is at first dried up, causing the two surfaces to lose their smooth character, and to rub upon each other with a



grating sound. But as the disease proceeds, the secretion, which at first is arrested, is afterwards increased in amount and altered in character, and, instead of being a clear transparent fluid, it is thick and glutinous, composed of albumen and fibrine, and being in fact the product of inflammation. A very favourable case of pleurisy may, it is true, run its course without any subsequent ill effect, and the inflammation in which the disease consists may be subdued by treatment; but far more commonly, pleurisy is attended by the secretion of albumino-fibrine between the opposed layers of the membrane, or by the secretion of an abundant quantity of serous fluid in the same position, or by the exudation of purulent matter. Hence the consequences of pleurisy are quite as dangerous, and often more fatal and intractable than the disease itself. If the case does not terminate by a rapid and complete cure, or *resolution* as it is called, the next most favourable termination is by the organization of the coagulable lymph, or albumino-fibrine, and the formation of adhesions between the opposed surfaces of the pleura. This coagulable lymph, which at first is of the consistence of a thin paste, gradually becomes more and more dense, it then becomes organized by the development within it of vessels and nerves, and the conclusion is that the two layers of the pleura are agglutinated together, as if they were composed of a single membrane. This appearance is very frequently seen in the bodies of those who are examined after death, and often in those in whom the existence of previous pleurisy



had not been suspected; a circumstance which proves two things, first, that pleurisy may occasionally occur in a latent form; and, secondly, that the adhesions in question are not incompatible with life and health. Indeed, on reflection, it is easy to understand why adhesions of the pleural surfaces are not necessarily attended with pain, and may be unaccompanied with any unpleasant symptoms or any characteristic physical signs. For the two surfaces of the pleura in the healthy state are in close apposition, being separated only by a very thin layer of serous fluid, which permits them to move freely and easily upon one another: they therefore follow in every respect the movements of the lungs and of the walls of the chest. Now, when the two surfaces are glued together by coagulable lymph, the intervening space is, it is true, obliterated, but as the interval was originally almost inappreciable, the filling in of the cavity is not felt as a material source of discomfort to the patient, and does not give rise to any morbid sound which can be perceived by the auscultator.

But a far more serious result of pleurisy is the effusion of a large quantity of serous fluid or of purulent matter between the pleural surfaces; for this deposition is a source of continual discomfort and suffering, and often leads to the loss of life. Now as the pleuræ of the two sides do not communicate together, it may happen that a very large accumulation of fluid may take place on one side, leaving the other side entirely unaffected; and, although the lung of the diseased side may be so com-



pressed as to be rendered quite useless, yet the lung on the other side may continue to perform its functions sufficiently well for the preservation of life.

When the fluid poured out into the sac of the pleura is in small quantity, or even sometimes when the effusion is considerable, it may be reabsorbed, and a cure may result; but in other cases the quantity of fluid goes on increasing, pressing upon the lung, squeezing that organ into a very small compass, and abolishing its functions; causing the spaces between the ribs to bulge out from the pressure of the fluid; and when the effusion exists on the left side, even turning away the heart, and pushing it over to the right side. When the effusion takes place in such quantity, it constitutes a disease which has received the name of *Hydrothorax*, or *water in the chest*; and when the fluid, instead of being thin and watery, is thick and of a yellow colour, or in other words, consists of pus, the disease is called *Empyema*. These affections are very formidable, and although they often admit of a cure, they more frequently destroy life, sooner or later, either by the discomfort and exhaustion which they themselves produce, or by the supervention of other diseases.

The auscultatory phenomena of pleurisy, under which disease must of course be included hydrothorax and empyema, are very characteristic, and, indeed, they often point out the disease and its exact seat with great accuracy, in cases where the general symptoms are very obscure and unsatisfactory. But, nevertheless, reliance



ought not to be exclusively placed upon the results of auscultation in pleurisy, because the peculiar sounds may not be heard, and yet pleurisy may undoubtedly exist. On the other hand, however, when the sounds about to be described are heard, there can be no doubt of the presence of pleurisy.

When the pleurisy is recent, the opposed surfaces of the pleura are dry, and instead of gliding noiselessly over one another, their movement by respiration is attended with a harsh, grating, or creaking sound, and the same result ensues when a small portion of lymph is thrown out upon the surface of the membrane, so as to cause a rough and uneven deposit, and interfere with that easy motion which exists in the natural state. Therefore, when the ear or the stethoscope is applied over the affected part of the chest, a rough, grating sound is heard at each movement of respiration, resembling, in some degree, the creaking of new leather. To this sound various names have from time to time been applied, but the more general designation at present is that of *friction murmur* or *rubbing sound*, a term which involves no theory, and simply expresses what is heard. Now if this murmur should exist, it is sufficiently indicative of inflammation of the pleura; but if it should not be heard, it does not prove the absence of the disease, because, if the examination is made very early, the dryness, or roughening of the pleura, may not yet have taken place; or if the chest is examined at a time when the disease is confirmed, the rough exuda-



tion may have given place to adhesions, or to the deposit of abundant fluid. In order, therefore, that this friction sound may be heard, the chest of the patient should be carefully examined at frequent intervals at the commencement of the affection, for the sound is transient, and it disappears both when the patient recovers, and when he passes to a more chronic state of disease.

If a small effusion of fluid results from the inflammation, the lung is partially compressed, and the voice, heard through the compressed lung, and then through the thin layer of fluid, and thus conveyed from the chest through the stethoscope to the ear, presents that peculiar tremulous or bleating sound, previously described (see p. 97), to which Laennec applied the term *ægophony*. This sound is also transient, because in an early state of the disease the conditions necessary to produce it have not yet come into existence, and in a somewhat later stage the effusion has either become absorbed, or has become more abundant, in both which cases *ægophony* can no longer be heard, for this sound depends upon the presence of a *thin* stratum of fluid in the pleural cavity.

When the effusion has become considerable, the fluid lies in great quantity between the lung and the walls of the chest, and in this case, when the latter are struck by the fingers, the percussion elicits a dull sound, instead of the clear sound which is produced by striking over the healthy lung; and on listening to the voice, sup-



posing the function of the lung not to be yet very much impaired, the sound is heard with greater clearness than in the natural state, being conducted through the compressed lung-tissue and the superjacent fluid. When the lung is altogether compressed and rendered useless, of course no voice sound can be heard at all, and in any case the respiratory murmur is inaudible. In partial effusion into the pleural cavity, there will be dulness on percussion over the extent of space occupied by the effused fluid; and the situation of the dulness will be varied by altering the position of the patient, as the fluid will, of course, gravitate to the lowest part of the chest; but when the effusion is very considerable indeed, the dulness will be universal over the affected side, and there will be a total absence of both the voice and the breath sounds.

Under these very formidable circumstances, the sufferings of the patient are very great; the cough is most distressing, and the difficulty of breathing is so urgent as to threaten impending suffocation. The abundance of the effusion causes a visible prominence or bulging between the ribs of the affected side, and by comparing one side of the chest with the other by accurate measurement, the diseased side is found to be actually the larger. If the effusion happens to be on the left side, the heart is dislocated from its position, and is turned over to the right side, and its apex is felt to be beating in its new locality.

Pleurisy is distinguished from pneumonia by the



acute pain, the hard dry cough, and the hard pulse ; by the presence of the friction-sound, when this can be heard, and by the absence of the crepitant rhonchus, and the other characteristic sounds of pneumonia ; from bronchitis it is distinguished by the absence of the mucous, sonorous, and sibilant rhonchi, and by the dry cough, and the friction sound ; but it must not be forgotten that pleurisy is often associated both with pneumonia and bronchitis, and the symptoms will then partake of the mixed character which denotes the combined diseases.

It is often exceedingly difficult, especially for the medical tyro, to distinguish pleurisy from some hysterical, neuralgic, and rheumatic affections of the side, which are very common, especially the hysterical pains experienced by young women. Patients of this class continually present themselves, both at hospitals and in private practice, complaining of acute pain in the side, with dry cough, and difficulty of breathing, and, indeed, offering many of the general indications of pleurisy. But upon examination it will be found that the breathing is not accelerated, and that the pulse is neither hard nor full ; there is, of course, a total absence of any friction sound, but there is acute sensibility of the surface of the body, a circumstance not generally observed in pleurisy. It is of great importance not to mistake pleurisy for hysteria, because the active treatment necessary for the first disease would be wholly improper in the second. It is more than probable, that the pretended cures of pleurisy by the Homœopathists



are nothing more than the successful effects produced upon hysterical females by an affectation of the marvellous; and as in these cases the diseases themselves are fictitious, the cures may be so likewise, and the infinitesimal globules can, at any rate, do no harm. Pleurisy is distinguished from neuralgia by the presence of the physical signs of the former disease, and by the intermittent, and often periodical character of the latter. From muscular rheumatism, pleurisy is distinguished by the physical signs, and by the absence of the lithic acid diathesis. A good practical distinction may be drawn between pleurisy and muscular rheumatism of the chest, by causing the patient to move his arms or his trunk, such movements causing acute pain in rheumatism, but not in pleurisy.

*Treatment of Pleurisy.*—This disease being in its nature inflammatory, requires to be treated by antiphlogistic remedies; and although, after the remarks which have been made upon the treatment of pneumonia, I do not insist upon the necessity of indiscriminate blood-letting and salivation, I nevertheless adhere to the opinion, that these remedies may safely be resorted to in many cases. If a case of pleurisy, therefore, should present itself in a subject otherwise healthy and plethoric, I should have no hesitation in directing blood, in considerable quantity, to be drawn from the arm, and leeches to be applied over the affected part of the chest; or if, from any peculiarity of constitution, bleeding should be inadmissible, cupping-glasses ought to be



applied, and blood drawn from the outside of the chest, or leeches applied in large numbers. This treatment should be followed up by the administration of *calomel* and *tartar emetic*, in the manner and in the doses described in the treatment of pneumonia; and when the inflammatory symptoms are subdued, then a blister, or a succession of blisters should be applied over the chest. All these measures tend to lower the action of the heart, and thus to subdue the inflammatory tendency of the whole system; and some of them tend, moreover, to check the effusion of the albumino-fibrine, which is the result of the disease, or to absorb it if it has been effused; blisters are of use in producing counter-irritation of the surface, and thus drawing away the morbid action from the interior.

When patients are labouring under fever, or the pleurisy is complicated with tubercular phthisis, both which cases often occur in practice, the treatment must be modified, with a strict regard to the depressing nature of the concomitant affections. When complicated with fever, it will be sufficient to administer small doses of *hydrargyrum c. cretâ* and small doses of a solution containing *potassio-tartrate of antimony*, and to blister the affected side. At the London Fever Hospital, where pleurisy often occurs as a concomitant of fever, I was in the habit of prescribing the above medicines, and applying at rather frequent intervals a strong *vinegar of cantharides* over the whole of the affected side. This application acts very rapidly, and is very efficacious; and



although it has been mentioned to me that its use is sometimes attended with dangerous after-consequences, I cannot say that I have ever noticed them, although I have used this blistering fluid very extensively, both in private and public practice. When pleurisy occurs in the course of tubercular phthisis, which it often does, to the great increase of the sufferings of the patient, it will usually be sufficient to apply a strong mustard poultice over the seat of pain, or if this is inadequate, to apply a blister, or some of the blistering fluid mentioned above.

Such is the treatment of the acute form of pleurisy, but it has been already mentioned that, whether from neglect in the first instance, or from the insidious progress of the disease, or the unsuccessful application of remedies, the malady sometimes assumes a chronic form, and gives rise to copious effusion of serum, or pus, into the pleural sac, constituting the affections called *hydrothorax* and *empyema*. Whether the fluid is serum or pus cannot be determined until an opening is made for its escape, and the treatment of both cases is the same.

When it is ascertained by the means above indicated, (see p. 136,) that an accumulation of fluid exists in the sac of the pleura, all possible means should be adopted to cause the absorption of the effusion. For this purpose, a mild mercurial course should be prescribed, the *pilula hydrargyri*, or the *hydrargyrum c. cretâ*, being administered two or three times a day in doses of five grains. At the same time, blisters of considerable size



should be repeatedly applied to the affected side of the chest. Together with these measures for reducing the quantity of effused fluid, those medicines should be administered which act as diuretics and hydragogues, and the effect of which is to carry off a large quantity of fluid from the kidneys and intestines. One of the most powerful medicines of the diuretic kind is *digitalis*, which is especiaibly serviceable in discharging the fluid of pleuritic effusions; it may be given either in the form of powder, tincture, or infusion; but the infusion is, perhaps, the best preparation, given in the dose of half an ounce once or twice a day. Care should be taken that the *digitalis* is fresh and of good quality, because its properties are much affected by its mode of growth, and its powers are impaired by long keeping; and, on the other hand, the effects of the medicine should be watched, because when given for a considerable period it is apt to lower unduly the action of the heart, and to induce disagreeable, or even fatal consequences. Another medicine of great value and potency is *elaterium*, which may be given, when the strength of the patient will permit its use, in the dose of  $\frac{1}{4}$  to  $\frac{1}{3}$  of a grain in a pill twice a day, until full purging is accomplished; but, as in the case of *digitalis*, the effects of this medicine should be carefully watched, lest undue prostration of the powers of life should follow its use. As an alterative and diuretic, the *iodide of potassium* may be highly recommended, in the dose of four or five grains in solution, two or three times a day; and other salts of potash



may also be administered, especially the *nitrate*, the *acetate*, the *bicarbonate*, and the *supertartrate*, (cream of tartar.) The diet, in this stage of the disease, should not be too low, but should be of a nature to sustain the patient, and to assist him in getting rid of the effusion. Light and nourishing food should, therefore, be allowed in moderation, and wine and water, or weak gin and water (from its diuretic action) may be administered.

Sometimes, notwithstanding all remedial measures, the fluid continues to accumulate in such quantities as to threaten the patient with suffocation, and it becomes necessary to discharge the effusion by artificial means. The operation performed with this object is called *paracentesis thoracis*, and it consists in making a puncture with a trocar and canula between the ribs, at a point where the fluid has been ascertained to exist. It is beyond the scope of this work to point out the method of performing this operation, or the dangers which are to be avoided; but it ought to be mentioned that, simple as it may appear, it is a proceeding followed by great danger in many cases, although it may be attended with occasional success. Before performing the operation, it is always advisable to introduce into the diseased side a grooved needle, which by allowing a small quantity of fluid to pass out, will reveal the nature and the existence of the effusion, while, if no effusion exists, no harm will be done, and the dangers of the proposed operation will be avoided. In a very obscure and difficult case which I attended a year or two since in consultation



with Sir John Forbes and Dr. Peacock, there was a dullness and swelling in the right side of the chest, which we thought *might* be due to pleuritic effusion, but on introducing a grooved needle into the seat of the dullness, no fluid escaped ; and after death, the examination of the body showed the presence of an enormous mass of medullary sarcoma in the liver and right lung. In another case where the effusion was well ascertained, and where the cough and difficulty of breathing were so great as to threaten speedy death, I was on the point of tapping the chest, but determined to give a final trial of other methods of treatment ; I accordingly applied a very large blister on the affected side, extending from the spine to the front of the chest, and it was astonishing to observe the diminution of the effusion and the relief of the symptoms obtained by this measure ; but eventually the effusion returned, and the patient died of exhaustion. It was ascertained after death that there was copious effusion of fluid on one side, and advanced tuberculous disease on the other ; so that if the operation had been performed, the beneficial results could have been only temporary. In another case I attended, the son of a professional friend, one side of the chest was completely filled by fluid effusion, but owing to his exhausted state an operation was not even proposed, and its inutility was manifested by the post-mortem examination, for the lung of the side containing the effusion was almost obliterated by the pressure, while the lung of the other side was filled with tubercles. It should



never be forgotten that hydrothorax on one side is often attended with tuberculous disease in the opposite lung, a circumstance which should make the practitioner doubly cautious in recommending or performing paracentesis of the chest.

#### THE COUGH OF TUBERCULAR PHTHISIS.

*Cough* is one of the earliest and most constant symptoms of that peculiar disease of the lungs, to which the terms Phthisis, and Consumption, and Pulmonary Tubercle have been applied; and, indeed, it is sometimes the only symptom which gives warning of the impending danger. A slight hacking cough, giving at first perhaps very little alarm to the patient or his friends, may indicate the existence of wasting disease, while all other circumstances may be quite consistent with health. Yet it cannot be denied that a deposition of tubercles may take place to a great extent in the lungs without any cough at all, and, on the other hand, the cough may depend upon a variety of other local and general circumstances. Still, as a general rule, a persistent hacking cough, attended with gradual emaciation, and not yielding to ordinary remedies, is a very suspicious circumstance, which demands the closest attention on the part of the practitioner. If the lungs, upon examination, should prove to be entirely free from disease, an important fact is ascertained in favour of the patient;



while, on the contrary, if traces of early disease should be detected, the discovery is of equal importance, because it is at the early period that the malady may be most successfully combated. To no other disease is the maxim "*Principiis obsta*" more applicable than to tubercular consumption; for if it can be detected early it may, as it were, be nipped in the bud; but when it has advanced to any great extent, the difficulty of the cure becomes greater in proportion to the duration of the malady and the amount of the lung-tissue which is invaded.

It is trite to remark upon the awful mortality of this disease, as there is scarcely a family which has not suffered from its visitation; and the young, the beautiful, and the intellectual too often fall the victims to its ravages. To counteract the evils inflicted by this scourge of mankind, the unremitting energies of the medical profession have long been directed; and whether we regard the knowledge which has been gained as to its seat and progress, or the means which have been placed at our disposal for controlling its course, the efforts of science must be regarded as being eminently successful. The practice of auscultation and percussion enables us, at an early period, to detect the first traces of tubercular deposition in the lungs, while the hygienic and special treatment, directed by sound judgment and skill, have often checked the downward tendency to premature decay; and if they have not always eradicated the sources of disease, have prolonged life or alleviated suffering.



The essential feature of tubercular consumption consists in the deposition, within the lungs, of a multitude of bodies, exhibiting a low form of organization, to which the name *tubercle* has been applied. In the earliest condition of the disease, these tubercles are scattered in great numbers in the upper part of the lung, presenting the appearance to the eye of small points of about the size of pins' heads, and having a somewhat hard and cartilaginous feel. These are called *miliary or grey tubercles*; chemically they consist principally of albumen of a low form of vitality, and when examined by the microscope, they exhibit a faint cellular organization. These minute bodies are replaced, in process of time, by other and larger masses, of about the size of a pea or a small bean, and of a yellow colour; these are called *yellow or crude tubercles*, and when examined under the microscope they are found to present a homogeneous and cheesy consistence, being quite destitute of any vessels or cells. Chemically they are composed of albumen, with some carbonate and phosphate of lime. As the disease advances, these yellow tubercles begin to soften, and aggregating together into masses, they at length break down and form cavities of greater or less size, surrounded by hardened and tuberculated lung tissue. Sometimes these cavities exist in great numbers, and the lung appears riddled with them; at other times, and, indeed most frequently in the fatal cases, one large cavity is found in one or in each lung, formed from the coalescence of a number of smaller cavities. Even



when one large cavity is found, others of smaller dimensions are found in its vicinity, which would, no doubt, if life had continued, have been gradually merged into the greater excavation. Around these cavities masses of tuberculated lung tissue are aggregated together, forming a dense solid structure, and next to these are observed isolated patches of crude tubercle, till scattered granules of grey tubercle mark the transition to the portion of healthy lung, if any of it should be left in a sound state. Although both lungs are not generally attacked simultaneously, yet it rarely happens in fatal cases that one lung is attacked with the disease while the other remains sound; both are commonly affected, although usually in different stages. It has been shown by repeated observations that the right and left lung are attacked, on the average, with about equal frequency, the differences observed by various authors not being of much pathological importance.

From having attended a great number of phthisical patients, having studied their symptoms, and the physical signs of the disease during life, and having made a great number of post-mortem examinations, I can fully confirm the general opinion that phthisis is most prevalent in youth and middle life, and decreases in proportion as age advances; and although it is true that no age is absolutely spared from its ravages, yet the old may solace themselves with the reflexion that amidst the manifold sufferings of increasing years, tubercular consumption need not practically be included in the cata-



logue. Dr. Cotton, in his work on consumption, shows by statistics that the most fatal age for the disease is between twenty and thirty, next, from thirty to forty, and next, from ten to twenty; but that, after the age of forty, its frequency gradually diminishes.

Tubercular consumption may be divided into three stages, namely—1st, that of tubercular infiltration, when the grey tubercles are scattered through the substance of the lungs; 2nd, that of softening of the tubercles and the incipient formation of cavities; and 3rd, the complete excavation of the lung by destructive ulceration. To these stages, a fourth has sometimes been added; and Dr. Edward Smith has gone so far as not only to give to this stage a peculiar name, the Pretubercular Stage, but he has even attempted to establish its diagnosis by the description of its physical signs. Admitting as I do, the probable existence of this stage, and that some general indications may lead us to suspect its presence, I cannot agree with Dr. E. Smith that he has succeeded in completely establishing its diagnosis, however desirable such a discovery may be. I think, therefore, that we must still endeavour to foresee the threatened advent of tubercles by general constitutional signs, which are, in many cases, rather manifest. In other instances, however, it must be admitted that the approach of tubercular deposition is remarkably insidious, and that this cruel disease has too often established itself in the system by clear indications before any advice is sought by the patient.



The first stage of consumption is characterized by a short hacking *cough*, which does not at first excite much notice, and is often mistaken for a common cold ; there may be also pain in some part of the chest, but this is by no means a constant symptom ; the patient often, and indeed generally, begins to waste, which is a very important indication, and one which ought to excite the most serious attention ; there is at first but very slight expectoration, and this is chiefly of mucus. Another formidable symptom, when it occurs, is spitting of blood, which sometimes happens in the early stage, and sometimes is developed at a later period. Very frequently the spitting of blood is the earliest intimation that there is any affection of the lungs at all. This symptom is of far less consequence in women than in men, because the former, from menstrual irregularities, often spit blood as a kind of natural evacuation.

In the second stage the symptoms are much more distinctly marked ; the *cough* is more violent, and is accompanied by a more abundant expectoration of mucus, often mixed with pus ; the emaciation is more decided, the pulse is rapid and weak, there are copious perspirations at night, and hectic flushes appear occasionally on the cheeks.

In the third stage, when the lungs have become ulcerated, all the symptoms are aggravated to the highest degree ; the *cough* is most violent and uncontrollable, the expectoration is abundant, consisting of pus and often of blood, the emaciation is extreme, the pulse is very



rapid and weak, the breathing hurried and laborious, the bowels either constipated, or what is more usual, very much relaxed, and the windpipe and the larynx are attacked with low inflammation. The hectic fever and the perspirations are constant symptoms, and depress more and more the powers of the patient, till at last he sinks from utter exhaustion, or from the supervention of some of those secondary maladies which follow in the train of the consumptive seizure. Very frequently, as is well known, this last stage, although characterized by so many formidable and fatal indications of approaching dissolution, is not one of much suffering to the patient, whose intellect may not only be unclouded, but his prospects may be cheerful;—a merciful provision of the Almighty to soothe the bed of suffering, and to illuminate with hope the passage to the grave. But the last days of the phthisical patient are not always so tranquil and painless, for the secondary disorders are sometimes so irritating that they entail constant distress, though they generally impress the mind of the sufferer with the conviction that they are the principal and not the subordinate maladies under which he labours. Patients under these circumstances imagine that their heart, or their stomach, or their bowels, are at fault, and that if the state of these organs could be rectified they would soon recover.

The physical signs of the different stages of tubercular consumption, by which I mean the evidence obtained from the auscultation, percussion, and inspection of the



chest, are of the very highest importance ; and, indeed, without a careful examination and correct appreciation of these signs no trustworthy conclusions can be drawn as to the existence or progress of the disease.

In the early stage of phthisis, the physical signs are often obscure, for the scattered infiltration of tubercles may not at first cause much appreciable change, either in the percussion or in the breath-sounds. But as the tubercles begin to aggregate themselves into distinct masses, the tissue of the lung becomes proportionally obstructed, and the breath-sounds modified. As the solidification generally exists in one lung before it attacks the other, there is almost always a difference in the percussion on examining the two sides, and it is only by carefully comparing the opposite lungs that any information can be obtained. The patient should be stripped in all cases where it is necessary to make an accurate investigation, and the spaces below the clavicles, and the clavicles themselves should be percussed in various modes, care being always taken that percussion is performed *at the same spot* on both sides, otherwise the comparison would be insufficient. If by this examination, it should be ascertained that one side is duller than the other, there is strong evidence that tubercles are developed in some spot, more especially if there are no signs indicating any other disease. The auscultatory signs in this stage are sometimes rather obscure, but are highly significant when they are discovered. In the very early condition, when the tubercles are only scattered through



the lungs, it is possible that there may be but little deviation from the healthy condition, and at most a slight whiff or breeze in the inspiration may dubiously denote the incipient tubercular deposition. In a person whom I lately examined for Life Assurance, I could detect no physical or general sign whatever of disease of the lungs, or any other part of the body, except a wavy inspiration at the very apex of the right lung; but my friend, Dr. Theophilus Thompson, whom I requested to see the case with me, considered this indication, in a male subject, to characterize the existence of miliary tubercles, although they might be very few in number, and not in an active state. As the tubercles begin to collect together, however, and the percussion note is distinctly dull over some part of the apex of the lung, the breath and voice-sounds are very perceptibly modified. The respiration instead of consisting only of a long sighing vesicular inspiratory murmur (see p. 90), consists of an inspiration and expiration of almost equal length, the expiration being thus heard in consequence of the passage of the air being arrested in its course to the extreme tissues of the lung, and the expiratory sound being conveyed to the ear by the now solidified textures. The voice-sounds are also modified by the same causes, and the voice, instead of being muffled and obscure by passing into the spongy lung-tissues, is now loud and distinct by being conveyed through a solidified medium.

In the next stage of consumption, the physical signs



are much more obvious, and as the lung-tissue ceases to expand by the healthy admission of air into its cells, the infra-clavicular space on the affected side will be seen to be sunk in comparison with the corresponding part on the other side. There will now be very distinct dulness over the affected region, and on applying the stethoscope, the expiratory murmur will be heard as loud as that of inspiration, and the voice, when the patient speaks, will also be preternaturally distinct. When the tubercles begin to soften, there will be heard very distinctly over some spot (usually near the apex), a short and sharp click, a modification of the mucocrepitant rhonchus, which is produced by the passage of air through the newly developed thick fluid. When this sound is heard, it is but too certain that the tubercles have ceased to maintain a quiescent state, and that the process of ulceration is now commencing.

In the third stage of the disease, the physical phenomena are sometimes entirely altered, although they merely indicate the advanced conditions of the preliminary lesions. Percussion beneath the clavicles may, perhaps, still give a dull sound, but this is not essential, for when the excavation in the lung is very great, is near the surface, and is filled with air, the percussion note may be clear, or even clearer than in the ordinary state. Under these circumstances, when the chest is struck with the fingers, and the patient opens his mouth, a sound is produced like that caused by striking a cracked pot, *the bruit de pôt fêlé*, of Laennec and the



French pathologists, and this sound was long supposed to be characteristic of the existence of pulmonary ulceration to a great extent; but Dr. Bennet, of Edinburgh, has lately shown that this sound can be produced even in healthy lungs, under certain conditions, and that, therefore, it is not diagnostic of tubercular excavation. When the cavity is large, is filled only with air, and communicates with a bronchial tube, the breathing is cavernous, and resembles the sound produced by blowing into an empty bottle, and it is then called *cavernous*, or sometime *amphoric respiration*, from *amphora*, a bottle or pitcher. When the patient is caused to speak, and the stethoscope is applied over the affected part of the chest, the voice is heard to come loud, direct, and clear to the ear of the auscultator, being transmitted from the cavity, through the intervening condensed lung-tissue, or the walls of the chest, then through the stethoscope. This very distinct phenomenon is called *pectoriloquy*, and is very characteristic of the existence of a cavity in the lung; but it should not be confounded with bronchophony, as, I fear, is sometimes the case, even with some good stethoscopists. Pectoriloquy is quite circumscribed, and the parts surrounding the cavity do not produce the sound, whereas bronchophony is more diffused, not terminating suddenly, but melting away, as it were, into the healthy lung-tissue. When I hear of marvellous cases, where extensive excavations of the lungs have been healed, I cannot help suspecting that bronchophony has been sometimes heard instead of pectoriloquy,



although I by no means assert that such cavities are *never* healed. When the cavity, instead of being empty, is filled with pus, neither cavernous respiration nor pectoriloquy will be heard, and it is, therefore, necessary that the patient should be examined on several occasions, in cases where it is desirable to make an accurate diagnosis. When the cavity is partly filled with air, and partly with pus, then the air will be heard bubbling through the fluid, and producing the large mucous or gurgling rhonchus. Sometimes, again, a tubercular excavation will communicate, by ulceration, with the sac of the pleura, and then both pus and air will escape into that cavity, giving rise to the production of what is called *hydro-pneumo-thorax*, the fluid occupying of course, the lower part, and the air the upper portion of the pleural cavity.

But I feel that I have entered at sufficient length into the description of the physical signs of this fatal disease; and I would observe that the diagnosis of its early stage is the most important as far as the treatment is concerned.

*Treatment of Tubercular Consumption.*—In the treatment of this dreadful malady, there are so many points to be considered, both curative and prophylactic, and involving both theory and practice, that it is difficult for an author to combine brevity with distinctness. Believing that much has already been done, and that much more remains to be accomplished in divesting this monster of its terrors, I would willingly enter at length into the nume-



rous theories of the disease, and the plans of treatment which have been recommended by competent authorities ; but, feeling that such a disquisition would lead me beyond the limits of the present treatise, I must content myself with briefly indicating my own views upon the subject, in preference to examining in detail the opinions of the host of writers who have, from time to time, laid their experience before the public.

In the first stage of consumption, which is by far the most amenable to treatment, our efforts should be directed to cause the absorption of the tubercles, or at any rate, to endeavour to arrest their progress. It has been shown that when they are unchecked in their career, they pass from the grey to the yellow tubercles, that the latter afterwards soften and form cavities, and that these cavities again finally unite into larger excavations, until the patient dies of general exhaustion and wasting discharges. But it would appear from the results of numerous post-mortem examinations, as well as from what may be surmised as occurring in the living body, that the miliary tubercles often become stationary, assume a horny consistence, and are then incapable of doing any further mischief. Whether the tubercles ever disappear altogether and are absorbed, is a question which, of course, cannot be determined with certainty, because they are never *seen* during life, and their disappearance after death can afford only negative evidence at the best. Although, too, I do not deny that even tubercular cavities may be healed, and that the puckerings and



depressions which are sometimes found, in post-mortem examinations, in the apices of the lungs, may be the scars of those ulcerations, yet there is a deficiency of positive evidence upon this point likewise. Nevertheless, I believe, from witnessing the progress of cases, and from carefully watching the stethoscopic signs, that the advance of tuberculization has been arrested, even if the deposition has not been altogether removed, and that the tubercles may remain in a dormant state for a great number of years, and even for the usual term of life, without, in many cases, causing much serious inconvenience. I believe also that while imprudence and the absence of medical treatment will accelerate the progress of destructive disease, on the other hand due care and judicious medication will retard it, and that, on the whole, a more favourable prognosis may be given in consumptive cases than could formerly be justified.

I think it should be distinctly understood that consumption is not an inflammatory disease, notwithstanding the opinion to the contrary, which is held by some French writers, and by a few in our own country. This point is not one of mere theoretical importance, but has a most important bearing upon treatment. That tubercular infiltration will *cause* inflammation, especially in such a delicate and highly vascular structure as the lungs, is quite true; but there is no more evidence of the inflammatory nature of the disease itself than in the case of cancer, or granular degeneration of the kidneys. If, therefore, there is no inflammatory



complication in the first stage, and there is no hæmorrhage, or none to any important extent, I commence at once with an alterative and tonic plan of treatment generally, with sedatives to relieve the cough, and counter-irritation over the seat of disease. The *cough* may be relieved by the remedies indicated in the section on the treatment of simple cough (see p. 33,) and irritation should be caused under the clavicles by some stimulating application. For this purpose I am in the habit of using an embrocation composed of equal parts of the *strongest acetic acid*, *oil of turpentine* and *olive oil*, to be rubbed in by means of a piece of rag, twice a day, for about five or ten minutes. Sometimes I employ the *tartar emetic ointment*, which produces a crop of pustules, with great relief to the symptoms, and occasionally I direct the *croton oil* to be rubbed in. In other cases again a *blister* applied beneath one or both clavicles, according to the seat and extent of the disease, has been productive of great benefit, as well as the application of strong *vinegar of cantharides*, which has already been alluded to in describing the treatment of hydrothorax. Together with or alternating with this active counter-irritation, I recommend the skin over the chest to be washed with water every morning, and rubbed dry with a coarse towel.

The medicines to be administered internally, in addition to those which may be prescribed to allay cough, are tonics and alteratives, and among the best tonics is I believe the *sulphate of zinc*. The use of this



medicine in phthisis was first strongly suggested to me by Dr. Owen Rees some time since, and I have constantly used it of late years with the best results. It is administered in doses of one or two grains twice a-day, in some tonic infusion, such as the compound infusion of *gentian*, the *infusion of calumba*, or the *infusion of cascarilla*. The preparations of *iron* are also efficacious, especially the *sulphate*, which may be administered in doses of one or two grains in a pill. The *iodide of potassium* is also a valuable remedy, administered in a bitter infusion, in the dose of four or five grains twice a-day; but the use of this salt should not be continued too long, as the action of iodine is somewhat depressing. The mineral acids, especially the *diluted sulphuric* and the *diluted nitric* are very valuable tonics given in a glass of water, in the dose of twenty minims every morning. The *sulphuric acid* is especially suitable when there is a tendency to hæmorrhage, and where there is much perspiration; but the best remedy for the latter symptom is the *oxide of zinc*, which is very much employed, and with great success, at the Consumption Hospital at Brompton, in the dose of five grains in a pill, and from which, in my own practice, I have witnessed the best results.

The employment of *Cod liver oil* in consumption marks a new era in the treatment of the disease. This agent has now been used in many thousand cases, and the majority of medical practitioners entertain a high opinion of its efficacy. Dr. C. J. B. Williams



in a celebrated paper, published in 1849, expresses his opinion that, "the pure fresh oil from the liver of the cod, is more beneficial in the treatment of pulmonary consumption than any agent, medicinal, dietetic, or regiminal, that has yet been employed." His observations were founded upon the results of 234 cases treated by cod-liver oil, in different stages of the malady; and he states that, of that number, 206 exhibited marked and unequivocal improvement,—“this improvement varying in degree in different cases, from a temporary retardation of the progress of the disease, and a mitigation of distressing symptoms, up to a more or less complete restoration to apparent health.” Since the publication of that paper, abundant opportunities have been afforded, in all parts of the world, for the investigation of the effects of this oil; and while it must in fairness be admitted that the results have not been altogether so gratifying as might have been wished, yet it is quite true that a most useful medicine has been added to the catalogue of our *Materia Medica*, for the treatment of tubercular diseases in general.

Viewing Pulmonary Consumption as a variety of scrofulous disease, and observing the very marked influence exerted over such affections by cod-liver oil, it can hardly be doubted by any practitioner that there is some solid advantage in using this agent. Whether it has really the power of arresting the progress of pulmonary tubercle, or causing its absorption, can never be determined with certainty, because we have no



means, except by the ear, of ascertaining the condition of the lungs in the living state ; but, that it does possess such a power is extremely probable, from the results of observation in phthisis and in allied diseases. I have been very much struck by witnessing its efficacy in the scrofulous diseases of children, in whom its operation appears almost marvellous, and in whom, under its use, the most decided symptoms of scrofulous disease unquestionably disappear. Those who admit the latter class of facts, attribute its efficacy to its employment as a dietetic agent, but surely this is begging the question, for if a remedy proves beneficial, of what importance is it whether it is regarded as a medicine or an article of diet ? But if it is meant that other articles of diet are equally efficacious, and that if the children of the poorer classes were better fed they would not require cod-liver oil, I think that the reasoning is not consistent with the facts ; for it must be remembered that scrofulous disease is not confined to the poor, but that it attacks the children of the wealthier and better classes, who have abundance of food and good nursing ; yet in such cases the effects of the oil are quite as striking as among dispensary and pauper patients.

My own opinion of cod-liver oil therefore is, that it is a most valuable agent in correcting that peculiarity of constitution on which scrofula depends, and in causing the absorption, or neutralization, and disappearance of scrofulous tubercle after it has been deposited. Believing also that pulmonary consumption is a variety of scro-



fulous tubercle, I regard the oil as possessing a very high degree of efficacy, and I have no doubt whatever that, especially in the early stage of phthisis, the operation of the oil is most beneficial. With regard to the administration of cod-liver oil, the best vehicle in which it can be given is, perhaps, orange wine, or infusion of orange peel, as recommended originally, I believe, by Dr. C. J. B. Williams. Children take this oil exceedingly well, and it appears rather agreeable to them than otherwise; but adults often have a repugnance to it. It should be administered only in small doses at first, a teaspoonful for instance, once a-day, and the dose should be gradually augmented to a table spoonful.

All these remedial measures should be adopted, if possible, in the first stage of tubercular consumption, and it is, unquestionably, in this stage that they will be attended with the most beneficial results. There are, I have not the least doubt, many persons now living who have one lung, if not both, in a partially tuberculized state, but in whom the disease is stationary and not likely to do any future mischief; and I have little doubt also, that many persons who have formerly suffered from the deposition of tubercle in its early stage, have entirely recovered, and now exhibit no trace of the malady.

But even in the second stage, when the tubercles begin to soften, we must not despair. Indeed, Dr. C. J. B. Williams, in the paper already referred to, expresses his opinion that even when ulceration is



commencing, the administration of the oil will check its progress. Although I cannot confirm this opinion by positive personal experience, I believe it to be well founded, and that the oil at this time ought to be administered in full hope of a beneficial result. At the same time, the *cough* should be allayed by sedative medicines, particularly by *hyoscyamus* and *conium*, and even small doses of *opium* may be used with advantage. *Prussic acid*, in doses of five minims of the pharmacopœial preparation, is very useful in allaying the irritation of the cough, and in quieting the whole system; and *dilute sulphuric acid* and the *oxide of zinc*, especially the latter, may be employed to control the copious perspirations which generally occur in this stage.

In the third stage, when extensive ulceration exists in one or both lungs, and the tuberculization is still advancing through the rest of the lung-tissue, the case is very serious, and not much remains to be done in the way of medical treatment. It may occasionally happen that the excavations are healed, or that they cease to extend or increase; but without denying that this is sometimes the case, I should receive accounts of such cures with some caution. Still, if a cure cannot be effected, much may be done to alleviate the sufferings of the patient; the cough is to be relieved by the remedies which have already been indicated; the perspiration is to be controlled by the *oxide of zinc*; hæmoptysis is to be arrested by the *mineral acids*, by the *acetate of lead*, by



*oil of turpentine*, in small doses, or (what I believe to be the best remedy) by the *gallic acid*, in doses of five grains every four or six hours. Constipation may be obviated by mild laxatives, as *castor oil*, *confection of senna*, or *Seidlitz powders*; and if diarrhœa should supervene, which is a most dangerous and often fatal symptom, it must be combated by *opium*, *chalk*, *catechu*, *kino*, *infusion of logwood*, *acetate of lead*, and other astringents.

The diet and regimen to be adopted in phthisis are matters of the greatest importance. As the disease is not an inflammatory one, but dependent upon a defective nutrition of the body, leading to the deposition of a substance of low vitality in the lungs, I think that nothing is more certain than that a nutritious and strengthening diet should be maintained from the commencement. The patient should, therefore, be allowed meat once every day at least; he should also take milk, and eggs, and should drink beer, especially bitter ale or bottled stout. Wine should be allowed only in moderation, and spirits of all kinds are better avoided altogether. The only circumstance contra-indicating this kind of diet, is the supervention of hæmoptysis, or of some inflammatory disease of the lungs or the pleura, as bronchitis, pneumonia, or pleurisy, in any of which cases the diet must be diminished in quantity, although even then care must be taken not to lower the patient too much.

As to regimen, much must depend upon the features of the individual case, and upon season, climate, and



locality. As a general rule, however, when the weather allows, moderate exercise should be taken in the open air, riding being better than walking, and conveyance on the water, if the patient does not suffer from sea-sickness, being better than either. Fatigue should certainly be avoided, and passive should be preferred to active locomotion. Sea-bathing should be recommended if the patient has been accustomed to it, and the weather is warm ; but in other circumstances, the use of the warm salt-water bath should be substituted, and in all cases, where it is practicable, sponging with salt-water, or water and bay-salt, should be practised over the whole body, especially over the chest.

I cannot refrain from expressing an opinion upon a point on which much discussion has taken place—namely, the propriety of sending away a consumptive patient to a distant land, in the hope of curing the disease in his lungs. I must own my conviction that not only very little good, but very much harm is generally done by such a proceeding. A patient is too often torn away from his home and his relatives, to perish in a foreign soil ; or after a brief sojourn in the land of his banishment, to return in a worse condition than when he went away. When the patients are fond of travelling, are able to bear the expense of it, and can carry their relatives and their household with them, there may be an advantage in a trip to the Mediterranean, or a residence in the South of France, or a tour in Egypt ; but in the great majority of cases, our own country



affords as much physical benefit to the sufferer, and is perhaps far more congenial to his sentiments and his affections, not to mention pecuniary and other domestic considerations. Many parts of our own coast are eminently well suited to the invalid afflicted with pulmonary tubercles; and among these places may be particularly mentioned the Undercliffe in the Isle of Wight, many parts of the coast of Devonshire, and Hastings. With regard to the metropolis and its suburbs, all the northern and north-eastern parts are of course objectionable as residences for the consumptive patient; but the southern and south-western parts are free from cold winds, and should therefore be preferred, if a choice is practicable.

#### COUGH FROM DISEASE OF THE HEART.

Diseases of the heart, in themselves, do not generally produce cough; but from the close association of this important organ with the lungs, pulmonary irritation is a frequent result of its functional or structural derangements. When any obstruction exists in the valvular apparatus of the heart, the current of the blood is arrested in its progress, and this fluid is then thrown back upon the lungs, causing engorgement, or inflammation, or hæmorrhage in their tissue. Hence bronchitis, and pneumonia, and pulmonary apoplexy may and do result from obstruction or insufficient closure of the mitral valves of the heart, and the cure of these diseases will be more difficult in proportion to the extent



of the cardiac lesion on which they are dependent. Again, when the heart is enlarged, and its action is too violent, the blood may be thrown into the lungs with too great force, and pulmonary irritation may be produced ; or when the heart is too feeble to receive and propel the blood which it receives from the lungs, there will be accumulations of the circulating fluid in the latter, giving rise to cough and difficulty of breathing. Even the nervous affections of the heart may, by sympathy, excite cough, owing to the close relation existing between the heart and lungs, by means of the nervous interlacements, which have been described in treating of the nerves of the thoracic region. As the diseases of the heart may produce diseases of the lungs, so do the morbid conditions of the lungs often occasion diseases of the heart ; and, indeed, one of these organs is seldom seriously or chronically diseased without injuriously affecting the other. But there is no special *cough* produced by the diseases of the heart, and when it occurs in connexion with its derangements, the peculiarities of each case must be carefully studied, and the treatment must be conducted on the principles already laid down. The best sedative for an over-excited condition of the heart is *digitalis*, given in the dose of a grain of the powder, fifteen minims of the tincture, or half an ounce of the infusion ; and as a very valuable local application, a *belladonna plaster* may be laid over the region of the heart, and left there as long as it will adhere.



## COUGH FROM ORGANIC DISEASES WITHIN THE CHEST.

There are many organic diseases in the chest, which by pressure upon the respiratory apparatus may induce violent *cough*; thus, for instance, cancerous tumours in the lungs, the pressure of an aneurism, and other serious maladies, will induce cough, the nature of which is often rendered obscure by the difficulty of discovering the exciting cause. The late Mr. Liston suffered from cough, difficulty of breathing, and spitting of blood, for some time before his death, and it was discovered only on the post-mortem examination that the source of his suffering was a large aneurismal tumour pressing upon the windpipe, and which caused his premature decease. Unfortunately, the maladies of this class are usually beyond the reach of art.

## COUGH FROM ACCIDENTS AND INJURIES TO THE CHEST.

A person may meet with an accident, and break one or more of his ribs; or a soldier may receive a bullet in his chest, or be pierced through the lung by a sword or bayonet wound; and in any case, *cough* and difficulty of breathing will be among the principal diagnostic symptoms, attended, especially in the case of the bullet wounds and the stabs, with spitting of blood. In the case of fractured ribs, the treatment consists in bleeding the patient, and promoting the union of the fractured portions, by keeping the ends in an immovable state.



This object is accomplished by binding a tight bandage around the chest, thereby preventing the intercostal muscles from dragging asunder the broken ends of the bones. The patient is compelled to breathe by the diaphragm alone, and as this is the essential muscle of respiration, he can, for a period, dispense with the use of any other. The rest of the treatment is directed to the cure of inflammation of the lungs, which generally supervenes, or at least, would do so, unless remedial measures were promptly adopted. In the case of a bullet wound, the bullet should be extracted if possible, and in all cases, the treatment should be the same as that described for inflammation of the lungs. In a sword or bayonet wound, or any other punctured wound, the orifice should be closed, and the case treated as one of inflammation. When a portion of lung protrudes from the wound, it is sometimes necessary to cut it off.

#### STOMACH COUGH.

I am rather sceptical in general as to the existence of what is called *stomach cough*, and am inclined to suspect, in many cases, an error in diagnosis, when such a complaint is announced. Yet, it is no doubt true, that some coughs do arise from disorder of the stomach, and when the distribution of the pneumogastric nerve is recollected (see p. 16), this sympathetic derangement may be readily explained. Many cases of mere dyspepsia will give rise to troublesome cough, in consequence of



the nervous sympathy just alluded to. This kind of cough may be distinguished by being unattended with expectoration, by not being marked by the auscultatory signs denoting thoracic disease, and by the dyspeptic symptoms presented by the patient.

*Treatment of Stomach Cough.*—The treatment should consist of those remedies which are adapted to improve the secretions of the body generally, and to correct the morbid conditions of the stomach. A few grains of *calomel* or *blue pill*, followed by a common aperient draught, will often be of great service, and a course of bitters and tonics with antacids, will generally effect a cure. The disappearance of the dyspeptic symptoms will be followed by the relief of the cough, which, however, will probably return with the recurrence of the stomach symptoms, which gave rise to it in the first instance.

#### COUGH FROM DISEASE OF THE LIVER.

As the liver is separated from the right lung only by the intervention of the diaphragm, it may be easily understood how by mere mechanical pressure, enlargement of the one will be followed by disturbance of the other, and experience teaches us that inflammation of one organ may by contiguity invade its neighbour. In fact, it is sometimes exceedingly difficult to determine whether the lower portion of the right lung is affected, or the upper surface of the liver; and I believe that both are often affected at the same time.



*Treatment of Liver Cough.*—In case of an enlarged or congested liver pressing upon the lung, and thereby producing cough, the treatment should consist in a mild mercurial course, with alteratives and aperients; and as soon as the healthy functions of the liver are restored, the cough will cease. In cases where the upper surface of the liver is inflamed, and the function of the lung is impaired, it will be necessary to treat the disease in the same manner as if the lung were in a state of inflammation; and the abstraction of blood and the administration of calomel, in doses to affect the system, will usually be successful.

#### NERVOUS AND HYSTERICAL COUGH.

The *coughs* arising from nervous and hysterical conditions of the system are among the most difficult which the medical practitioner is called upon to treat, and they often simulate serious derangements of the respiratory organs. Sometimes there is loss of voice, cough and difficulty of breathing, simulating laryngitis; sometimes there is a hoarse barking cough and pain in the throat, resembling the symptoms of some forms of tracheitis; sometimes there is long-continued hacking cough, with perhaps emaciation and loss of appetite, alarming the relatives with fears of tubercular consumption; and often, as I have before noticed, (see p. 138,) there is acute pain in the side, cough and difficulty of breathing, simulating pleurisy.



*Treatment of Nervous and Hysterical Cough.*—These forms of cough usually occur in hysterical young women, and whether they arise from nervous irritation, or from imitation, or from a wish to excite interest, or from a desire to deceive, the medical practitioner should be thoroughly on his guard in the management of such cases, for his own reputation and the recovery of his patients will greatly depend upon his own tact and discernment. A careful examination of the lungs and heart will enable him to determine whether those organs are diseased or not; and if he finds that they are healthy, and that the patient in other respects exhibits the hysterical temperament, he should adopt the remedies appropriate to hysteria. It will usually be found that patients of this kind are labouring under some derangement of the uterine organs, which will then require especial attention; and the general health should be promoted by exercise in the open air, wholesome food, and the absence of undue excitement. The bowels should be kept open by aloetic purgatives, if the general symptoms permit their use, and *valerian*, *assa-fœtida* or *castoreum* may be administered at frequent intervals. The ordinary remedies for cough are entirely ineffectual in these nervous coughs; and the whole series of sedatives and narcotics may be employed without any benefit. On the other hand, change of air, sea-bathing, horse riding, walking in the open air, early rising, and the shower-bath, will generally effect a cure after all other means have failed. It must never



be forgotten that hysteria, although not associated with important morbid lesions, entails great suffering upon the patient, and the practitioner, while he guards against confounding its manifestations with the symptoms of fatal and dangerous maladies, must not ridicule or underrate the pains which are described to him, or imagine that they are not as agonizing as those which threaten the destruction of life.























