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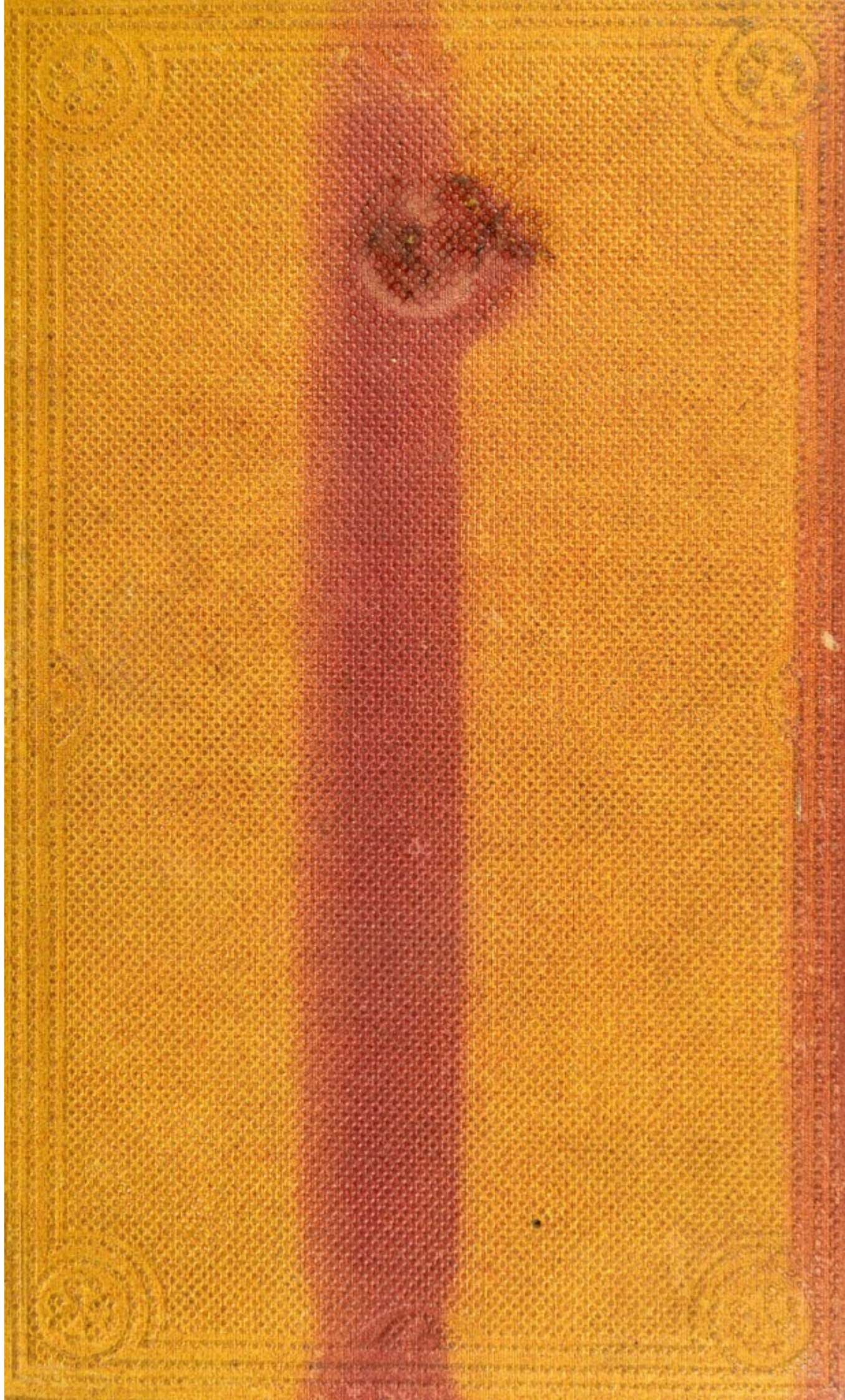
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ON
CONSUMPTION AND BRONCHITIS
COMPRISING
SCROFULA

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THE FORMS, COMPLICATIONS, CAUSES,
PREVENTION AND TREATMENT
OF
CONSUMPTION AND BRONCHITIS

COMPRISING ALSO

THE CAUSES AND PREVENTION OF

SCROFULA

BY

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PREFACE.

OUR knowledge of the pathology of pulmonary diseases, and of their seats and progress, has not hitherto tended greatly to promote the success of medical treatment. Indeed the only recent advancement in this direction has been the introduction of cod-liver oil and other fish oils. With this single exception the treatment of Pulmonary Consumption at the present day is nearly the same as that advised by the best medical writers of the seventeenth and eighteenth centuries, and more particularly by BENNET and RUSH. This inference is manifest from the sketch I have exhibited of the treatment recommended in these centuries. Although the means of cure have been enriched by very few additions, pathological and diagnostic progress has furnished more precise information, whereby the physician is enabled to employ his remedies more appropriately, and hence with more frequent success. Equal advantages, however, to those were formerly obtained from close observation of the history and the existing state of individual cases, and from a due recognition of the effects of medicines — from a rational and an enlightened experience.

The treatise on Pulmonary Consumption, being the *First Part* of this work, appeared in the third volume of my

“Dictionary of Practical Medicine.” I have revised it, and made very considerable additions to it in this edition, as well as rendered it of more easy reference and consultation by means of a copious Index and Table of Contents.

The remarks on Laryngeal Consumption, forming the *Second Part*, are partly those which also appeared in the second volume of the work just referred to. I have made considerable additions to them, but with a due regard to conciseness.

The treatise on Bronchitis, being the *Third Part* of this work, may be viewed as nearly original: although an article on Bronchitis was written by me in 1831, and formed a part of the first volume of my “Dictionary,” yet this had been so long before the profession and public, no other treatise on this disease having appeared since that period, as to induce me to write it anew, and to state the results of a longer and more extensive experience.

In the accounts of the pathology and treatment of these diseases, not only have the primary, simple and unassociated states been described, but also those complications which they most frequently present in practice. The complications which are seldom met with have either not been noticed, or only mentioned. For the observing physician, who recognises and treats the more frequent complications correctly and appropriately, will not fail to notice with sufficient precision those of rarer occurrence. Thus bronchitis may affect a paralysed person—the form of paralysis being different in different cases; and in some of these the bronchitic disease may be rendered most severe, or asthenic, or dangerous, and require expectorant and restorative or tonic

remedies; whilst in others it may not be materially influenced by the paralytic malady. Other associations very rarely observed are also passed over, but those which more frequently occur are fully noticed. If the information respecting them, in the opinion of some, be insufficient and unsatisfactory, it may at least be admitted to be suggestive, and hence all that the well-educated physician or the scientific reader may require.

In the treatises on the above important diseases I have endeavoured to assign with precision the several forms and states they present, and with due reference to the conditions of vital force—(of vital energy, power, or endowment). This force, in its various and ever-varying manifestations, throughout the general systems and special organs, animal and organic, of the body, has been made, in connection with the states of vascular action, the basis of therapeutical indications for the diseases comprised in this work, conformably with the principles of pathology and medical practice adopted and developed in my “Dictionary of Practical Medicine.” While discussing the pathology and treatment of Consumption and Bronchitis in the present publication, not only the conditions of vascular action and of the circulating fluids, but also the manifestations of vital force or power by which these conditions are influenced, developed, and controlled, are considered as fully as the difficulty of these subjects permit: for, in actual practice, the successful treatment of these diseases chiefly depends upon a correct estimate of these most important pathological conditions. During the last half century physicians have had their minds pre-occupied, and their attention carried away, by the recognition of changes

of structure and of palpable organic alterations, from a due estimation of those conditions of vital force, of vascular action, and of the circulating fluids, which constitute the essential principles of disease, which chiefly engaged the deepest consideration of their predecessors, and which guided them to the adoption of appropriate indications and means of cure, and to practical results at least as successful as those achieved by the modern pathologist.

5, Old Burlington Street, W.

January, 1861.

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CONSUMPTION AND BRONCHITIS:

THEIR PATHOLOGY AND TREATMENT

PART I.

THE FORMS, COMPLICATIONS, CAUSES, PREVENTION, AND TREATMENT OF CONSUMPTION.

THE usual forms of Consumption, or those seated in the lungs, may be *characterised* as follows: other forms, or those seated in the respiratory passages, will be considered hereafter: —

CHARACTERISTIC SYMPTOMS OF PULMONARY CONSUMPTION*:—*Unusually quick respiration on slight exertion, short cough, hectic fever, and emaciation: expectoration at first wanting or scanty, afterwards varying with the progress of disease, sometimes streaked with blood, or attended by more marked hæmoptysis: colliquative perspirations and diarrhœa, or both alternately, generally supervening and hastening dissolution: usually occurring in the scrofulous diathesis.*

* SYNONYMES, &c.—*Phthisis* (φθίσις, from φθίω I waste or decay), Hippocrates, Cullen, &c.;—*Tabes*, Celsus;—*Phthisis pulmonaris*, *Phthisis pulmonalis*, *P. scrofulosa*, Frank, Pinel, &c.;—*Ph. pulmonalis tuberculosa*, *P. scrofulosa*, Auct.;—*Affectio Phthisica*, Hoffmann—*Hectica Phthisis*, Young;—*Marasmus Phthisis*, Good;—*Exulceratio pulmonum*, *Consumptio pulmonum*, *Cachexia tuberculosa*, *Cachexia scrofulosa*;—*Lungensucht*, *Schwindsucht*, *Lungenkrankheit*, Germ.—*Phthisie pulmonaire*, Fr.;—*Tisi pulmonare*, Ital.;—*Tisica*, Sp.;—*A Phthisic*, *Consumption*, *Decline*, *pulmonary Consumption*, *Tuberculous Phthisis*, *Tubercular Consumption*, *Consumption*, *Tuberculosis of the Lungs*, *Tubercular Disease of the Lungs*, *Scrofulous Cachexy*, *Tubercular Cachexy*, &c. &c.

PATHOLOGICAL DEFINITION. — *The infiltration of tubercular matter in parts of the lungs; the morbid deposit undergoing metamorphosis, most commonly softening and more complete solution, followed by erosion of the containing tissues, by ulcerating cavities, by successive changes in adjoining parts, especially by vascular congestion, sanguineous exudation or extravasation, or inflammatory action, generally limited to the adjoining structure and to the bronchial canals communicating with the tubercular formations.*

In addition to the above *symptoms* and *lesions* characterising tubercular consumption, there are many others less commonly present, that can be comprised only in a more detailed description of the several forms and stages of the disease. Of these sufficient notice will be taken in the sequel. Some of the topics more intimately connected with *scrofula*, will here receive a passing notice, in as far as they are more especially related to pulmonary phthisis. The intimate connection of *scrofula* and tubercular formations, in all cases, and their actual identity as respects especially their causes and constitutional relations, have been fully discussed in another work, and this connection is now generally admitted (*see the Author's Dict. of Practical Medicine*, vol. iii. pp. 9, 731, *et seq.*) It is therefore unnecessary to advert to these topics in connection with tubercular phthisis, especially as they will be made apparent during the description of the causes and organic changes of this malady.

I have frequently been convinced, during an experience of many years, of the presence of tubercles on the lungs, before the physical signs of their existence could be detected: and very often have I inferred their presence even at a very early stage, before either percussion or auscultation was resorted to. I can fully corroborate the inference drawn by my friend DR. McCORMAC of Belfast, in his unpretending but very able and learned treatise on consumption, that the “existence of tubercles may be inferred from the general aspect and condition of the patient,” before any physical examination is instituted — “before the patient has spoken a word or emitted a sound.” The earlier, and many of the more recent cultivators of auscultation overlooked the fact, that solitary or scattered tubercles in the lungs do not necessarily affect the sounds in the lungs — that tubercles do not always furnish a physical sign — in many even when the constitutional and physiological symptoms evinced the early stage of phthisis — the stage in which the recognition of the malady is most important, and in which a true estimate of these symptoms should be made and

chiefly confided in: they relied too confidently on the physical signs, and neglected the physiological and rational symptoms.

The *forms* and *states* of pulmonary consumption—of tubercular disease, affecting chiefly the lungs—and the numerous complications or morbid associations, either developed in the course of this malady, as contingent and intercurrent affections, or existing in the frame as latent or as manifest disorders from the commencement, severally require due recognition and diagnosis, and claim the especial investigation and study of the physician. The early aberrations from health which indicate the commencement of tubercular phthisis have been, during the greater part of the period of which my experience is cognisant, either imperfectly estimated or overlooked; whilst attention has been, and still is, directed alone, to that which, although fully deserving a due portion of attention, should not receive an undivided investigation—to *physical diagnosis* in the several forms and methods, in which it has recently been paraded, over-estimated, and lauded. Owing to this one-sided study, to the fallacies inseparable from its nature and to those which arise from varying conditions of vital influence and action, from different states of secretion and excretion, from numerous disturbing causes appearing contingently, and from habits of dogmatising with the view of exhibiting a precision of acquirement and knowledge beyond what has been previously reached, the cultivation, if not the advancement of physical diagnosis, to the neglect of the intimate observation of constitutional and physiological changes, has been generally attempted. Manipulations which strike the senses of the attendants, and more than one sense of the patient,—examinations which may be seen, felt, and talked about, have a much more impressive and lasting influence upon both patient and spectators, than the close observation of symptoms and the pertinent inquiries of the profound and comprehensive thinker. The former are lights which the possessor places upon an eminence for his own advantages; the latter are intended entirely to benefit the person for whose safety they are employed. The one method strikes and impresses the patient and those around him, the other is at best but imperfectly estimated, or even altogether unheeded.

Auscultation, which is of great service in the progress of phthisis, is much less advantageously employed at the commencement and even during the early stage of the malady. Too great dependence upon, and a too *ad captandum* parade of, this mode of diagnosis, sometimes even with the fussiness and the flourishes of vulgar

craft, have tended to the neglect of those states of vital manifestation, of disordered functions, and of vascular action, which, whilst they indicate incipient or early pulmonary disease, also characterise its forms, and point to the changes in which these forms originate, and on which they continue more or less to depend. The presence or absence of certain sounds on percussion and auscultation, the states of development and of mobility of the several regions of the thorax, both individually and in relation to each other, are all of great importance in themselves, but this importance is heightened when they are viewed in connection with their causes and with existing conditions of vital manifestation, of morbid function and of vascular action.

CHAPTER I.

GENERAL REMARKS AS TO THE ORIGIN OF TUBERCULAR CONSUMPTION.

MUCH has been written upon this topic, yet it remains at the present day a *quæstio vexata*. At an early period of pathological speculation the formation of tubercles, whether occurring in the lungs or elsewhere, was imputed to impaired vital influence, and afterwards to depressed nervous energy. At a more recent period a morbid nutrition obtained credit for the mischief, although it might have been difficult to show how nutrition, however morbid, could have formed what was admitted to be neither organised nor organisable. Then it was attempted by ROKITANSKI and his followers to describe tubercles as transitions from organised to non-organised formations. Still more recently the origin of this formidable malady was laid in the blood; and if the actual existence of the tubercular matter could not be detected in the circulation by the microscope, after the most minute search, the elements of this matter doubtless existed. Indeed, this conclusion could hardly be denied; for, where vascular assimilation is deficient, the materials for morbid formations must necessarily abound; and the development of tubercular formations will necessarily most readily take place in situations and structures most favourable to this morbid process, and most exposed to the influence of the causes which predispose to, or produce it. When organic nervous power is impaired, vascular assimilation and healthy nutrition

must necessarily suffer; and those tissues and organs, which are the most disposed by function and organisation, and as respects their capillary circulation and their secretions, to experience the early effects of these changes, will be the first to manifest disease, and the most likely to experience disorganisation.

2. The morbid formations found so frequently in cellular and serous tissues, and in glandular structures, and so generally resulting from the pre-existing disorders just stated, § 1, viz. from impaired nervous or vital force, and its attendant weakened digestive, assimilative, and nutritive manifestations, and which have been so often described as tubercular, obviously change remarkably in the course of their development, growth, and decay. They may also vary at the same stage of their growth in different persons, and even in consequence of the states of vascular action in the tissues in which they are seated. Hence may arise the differences in the results of researches into their *chemical constitution* by eminent observers. It appears, however, that tubercular deposits consist:—1st. Of animal matter and certain earthy salts in varying proportions.—2nd. That animal matter is most abundant in early and in rapidly formed tubercles, and the earthy salts in the chronic states of these productions.—3rd. That the animal matter consists of a large proportion of albumen, with small and variable quantities of casein, fibrine and fat.—4th. That the earthy salts of tubercles are chiefly the insoluble phosphate and carbonate of lime with a small proportion of the soluble salts of soda. Very little difference has been detected between recent tubercles and other so-called compounds of protein, as respects their ultimate composition. VOGEL contends that all that is known of tubercle in its early stage is, that it is a protein compound. On the other hand SCHERER and others infer that it is not always identical with protein, but differs in composition more or less in different cases as well as in different stages of growth. It may therefore be stated that, in addition to protein, it contains the salts just mentioned, fat, or a suetty matter, extractive, phosphorus sulphur, and pyin. During softening, tubercles present certain chemical changes, the phosphorus and sulphur diminishing and ultimately disappearing altogether. As they change into concretions in their chronic or prolonged states of existence, the calcareous salts greatly predominate, a small percentage of animal matter remaining.

3. Dismissing the chemical constitution of tubercular forma-

tions in which *pulmonary consumption* or *phthisis* originate, I shall now briefly advert to the constitutional states in which these formations in the lungs generally take place, and with which they are more or less intimately allied during the greater part or the whole of their progress. These states have been very imperfectly described and distinguished from each other, both in health and in disease; the great difficulty of assigning distinctions, arising from their mixed characters, the manner in which they pass into one another, and the association of temperament, diathesis, and habit of body being often such as to obscure the subject, and to render precise and accurate observation almost impossible. Nevertheless, these states have a more or less intimate relation to the forms or varieties of tubercular consumption, and should hardly be separated from a due consideration of the influence and *modus operandi* of the predisposing and exciting causes. Certain of these, especially the *scrofulous diathesis*, and very probably this only, have a most intimate connection with the pulmonary disease, whilst others are much more doubtfully, or even are in no ways, related to it. They should, notwithstanding, be viewed in connection with the causes, the courses, the morbid associations, and the inter-current affections of tubercular phthisis. The imperfect attention which has hitherto been directed to this part of the subject must be my apology for the insufficient discussion of it at this place; my object being rather to indicate, than to supply, the deficiency: to this latter end precise observation and patient research are altogether wanting.

4. i. *The Scrofulous Diathesis or Taint* is the most common constitutional condition in which phthisis occurs. It is that intimate organisation of frame which results from those predisposing causes, referable to the parent and to the infancy of the offspring, and which, with these causes, I have described when treating of SCROFULA and TUBERCLES* (see § 3, *et seq.*). But although it is most frequently the basis of the tubercular formations in the lungs, whether latent or developed—the soil in which they grow—yet these formations may appear in other conditions of the frame than this, when the predisposing and exciting causes are in energetic or concurrent operation. In this condition, however, the tubercular formations in the lungs are most prone to pursue their more usual chronic course, especially after the age of puberty, and before the period of middle age. They may also assume the acute

* See *Dictionary of Practical Medicine*, &c., vol. iii. pp. 731, *et seq.*

form, especially in the plethoric, and when their causes are more than usually active.*

* "A careful distinction should be made between the scrofulous diathesis, taint, or predisposing constitution, and the actual manifestations of scrofulous disease,—between the *Ens in potentia* and the *Ens in actu*. The scrofulous diathesis may, by the debility or the susceptibility accompanying it, predispose to other diseases besides those which are more strictly strumous or tuberculous; and a distinction should therefore be drawn between the latent or inactive scrofulous taint, the diseases which are not strictly attributable to this taint, and those maladies which are actually the structural manifestations of it. But is this distinction readily drawn? I believe not; and that the descriptions and distinctions adduced by HUFELAND, LLOYD, LUGOL, and many others, are so loose, and present so numerous exceptions, that they deserve, in many particulars, but little credence, and certainly some of them at least require a more particular investigation.

"The chief characters of the scrofulous taint or *cachexy* enumerated by writers are the following:—(a.) A want of due bodily symmetry; small, weak, or crooked limbs; a gibbous or pigeon breast and flattened ribs; hare lip; hypertrophy of the pubis, the sacrum and the ischia:—(b.) A certain character of the head and face: the jaws are said to be broad, the forehead low and angular, and the neck long and rounded; a head larger than natural, especially posteriorly; a puffed up rounded visage; great transparency or whiteness of the skin, often with a rosy-tint of the cheeks; a pale, inflated countenance; the chief colour of the dark complexion is dull or dirty, of the fair an unnatural whiteness, frequently with an agreeable redness of the cheeks; in others a waxy yellowness, with a dirty pallor round the mouth. Bluish rings round the eyes; the eyes most frequently large, oftener blue than dark; the pupils are commonly large; the tunica albuginea of a pearly whiteness, traversed by injected blood vessels, especially if the mesenteric glands are affected, or of a bluish whiteness, and the pupils large when the lungs are diseased. The eyelids are often œdematous, the eyelashes are long, the Meibomian secretion is increased. The nose is wide or swollen, or red or shining; the upper lip is thick and projecting, and the furrow between it and the nose is deep. The general expression of the countenance indicates indolence and want of energy. The first teeth are small and subject to caries. The second are broad, often covered by a glairy secretion, are very white, readily split, and often become carious.

(c.) "The appetite is irregular—sometimes impaired, at other times voracious; occasionally there is nausea; the tongue is often foul, the breath fetid or sour; the bowels are irregular; flatulent eructations are frequent and acid; and the excretions are also acid. The abdomen is large, tumid and flatulent on percussion. Discharges from the nose are common, and from the vagina not unfrequent. The soft solids are flabby; the adipose and cellular tissues abundant but soft, giving the surface of the body a full and rounded contour; the limbs are deficient in rigidity and firmness. The tendons are small and yielding; the capsules of the joints are weak; and the heads of the long bones are large. Hence a disposition to lateral curvatures of the spine, thick ancles and joints, large ill-formed hands and feet, and falling of the arches of the latter. The shoulders are high.

(d.) "The blood, whose condition is yet but little known, appears to be, from the commencement, poor in globulin and hæmatin, rich in albumen, which, at a later period only, diminishes also. There are abundance of lymph, extension of the lymphatic vessels, marked development of the lymphatic glands, and predominance of the cellular system, not only under the skin, but in all the organs, where it commences to replace the specific tissues, which is especially apparent in the muscles, the bones, &c. All the mucous secretions are augmented, and they often become albuminous.

5. ii. *The Lymphatic Temperament* has been supposed, especially by French pathologists, to predispose to phthisis more frequently

(e.) "General lassitude, languor, and debility are commonly experienced, with an inability to sustain prolonged physical and intellectual exertion. The powers of the mind, although generally feeble, are often precocious. DR. GLOVER remarks that, in very few of the subjects which he had examined, has he found the bodily or intellectual powers fairly developed in a degree proportionate to the age and circumstances of the patient; and that a general retardation of development seems one of the most constant features of this peculiarity of constitution. According to HUFELAND and FISCHER the generative functions are early and powerfully manifested. They may be early and frequently, but certainly not powerfully exerted. LUGOL maintains that these functions in scrofulous subjects are below the average.

(f.) "The *Urine* is usually very pale, unless vascular excitement be present. Its specific gravity is low, and in children it is more acid than usual. There are differences of opinion as to the nature of the free acid; some consider it phosphoric acid, others hydrochloric acid, and others, again, lactic acid. The urea and uric acid are often diminished, whilst the salts, especially the phosphates, are increased; and even oxalic acid—an acid foreign to normal urine—has been found in the urine of strumous children. According to SCHÖNLEIN the chief alterations observable in the urine of scrofulous persons consist in the diminution of nitrogenous constituents—the urea and uric acid; and in the appearance of the non-nitrogenous oxalic acid, and more rarely of Benzoic acid. The acids are frequently so abundant that the urine, upon cooling, deposits copious sediments of the oxalates, and these sediments sometimes form renal and vesical calculi. The frequent occurrence of oxalate of lime or mulberry calculus in scrofulous children is well known.

(g.) "In many instances, most of the alleged characteristics of the scrofulous constitution may distinctly exist, whilst no morbid deposit takes place, and in others, diseases ascribed to this construction may take place in persons in whom the marks alluded to cannot be recognised. In addition, however, to most of the indications which have been enumerated, others which characterise also this diathesis, may be enumerated, namely, a want of muscular development; an hypertrophied or infiltrated condition of the cellular tissue, which rapidly disappears under privation or disease; a pallor and coldness of the surface, owing to a feeble circulation; a marked disposition to disorders of the respiratory and digestive mucous surfaces; frequent soreness of, or discharges from, the nose, the eyes, and the ears; enlargement of the tonsils; the frequent dryness of the skin, or a greasy, sour, or fœtid exhalation from the skin; and more or less disorder of nearly all the abdominal secretions and excretions.

(h.) "The colour of the hair is very variable; but for the most part it inclines, according to MR. PHILLIPS, to a dark tint. Of nearly 9000 scrofulous children he found a little over 32 per cent. had light hair and eyes. BARTHEZ and RILLIET state that, of 314 tuberculous children, the hair was fair in 150, red in 4, chesnut in 71, black or dark in 40, and not observed in 49. DR. GLOVER remarked that, in 126 cases, 86 had fair hair and eyes, and 40 were of a dark complexion; and that in some workhouses, 97 cases had a light, and 47 a decidedly dark complexion. MR. PHILLIPS remarks, that 'the *alæ nasi* may be broad, but for the most part they are not so. The upper lip or even both may be tumid, but in the majority of cases they are not so. There is not, as some have supposed, anything constant in the shape of the lower jaw, or in the appearance of the teeth.' He observes that the scalp and other parts of the integuments are often the seat of eruptive affections.

(i.) "It is obvious from the above, that the strumous diathesis may be viewed as

than any other temperament or diathesis, excepting scrofulous. This may be the case, for I am not prepared to dispute it; but, if the question be put as to what constitutes the lymphatic temperament, and as to what signs this temperament may be recognised? but few will agree in the answer, or be prepared to answer it at all. This much may be said respecting it, that it is very closely allied to the scrofulous taint or diathesis, that the lymphatic system is prominently developed in persons possessing it, and that the lymphatic glands and serous membranes in those persons are very prone to become the seats of tubercular deposits, whatever may be their complexions or races.

6. iii. *The melancholic, phlegmatic, and bilious temperaments* do not predispose to phthisis. When this malady occurs in either of these constitutional conditions, it is generally caused by several concurrent influences, and it frequently assumes a very protracted form, or it remains long latent before it is openly and fully manifested. It may then be far advanced, and either assume in this state a chronic form, or proceed rapidly to the usual termination. It is often, however, very difficult to determine the diathesis and temperament of persons labouring under phthisis, especially in its advanced stage; and the comparative tendencies of either temperaments, diathesis, or habits of body, to this disease, have not been ascertained with a sufficient precision to enable me to state anything with confidence on this topic.

7. iv. *The nervous, the irritable, and choleric temperaments* present no very marked predisposition to phthisis, although this malady may appear in either of these temperaments when the causes are energetic. In these the disease is prone to assume an acute, rapid, and febrile character, or to be associated with bronchitis or laryngitis; and in the nervous temperament especially, it may, in its early course, present many of the characters of nervous fever,

an original or an acquired deterioration of the constitution from the natural healthy pitch or condition,—and that, before any actual manifestation of disease takes place, there may long exist such a state of organic nervous power, of circulation, of function, and of nutrition,—of general asthenia, and of deficient structural development, as to constitute an obvious and wide divergence from health, before the scrofulous formation or tuberculous deposit takes place,—and, moreover, that the characters now described, as constituting the scrofulous taint, cachexy, or divergence from the actual healthy condition, may exist for many years, or throughout a long life, without being followed by any of the marked structural manifestations of scrofulous disease or tuberculous deposit, although many determining or concurring causes very easily develop these diseases, in very active and manifest forms."—*Dict. of Pract. Med.*, vol. iii. p. 731, by J. COPLAND, &c.

or, in children, of remittent fever. In either of these constitutional states various complications may occur in the progress of the disease, affecting either the lungs or other organs. Although hæmoptysis may take place in either of these, it is not so frequent in them as it is in the sanguineous temperament, or in the scrofulous diathesis.

8. v. *The sanguineous temperament* is probably more disposed to phthisis than those last noticed (§§ 6, 7.); but it is more especially so disposed when it is associated with the scrofulous diathesis. It is then apt to favour the occurrence of an acute or febrile form of the malady, which frequently becomes, at some period or stage of its course, complicated with hæmoptysis, with pneumonia, and various other lesions of the lungs and pleura. Hæmorrhage, inflammatory hæmorrhage, inflammation of the substance or of the bronchial surface of the lungs, partial or more or less extended, chronic or acute pleurisy, congestion, &c., may, however, severally occur as intercurrent affections, or consequences of tubercular formations in the lungs, but seldom as causes of these formations. When either of these affections are occasioned by the tubercular deposition the development and progress of this disease may be, but not necessarily, developed by it. It may be concluded that neither tubercular consumption, nor tuberculosis in general, is often a consequence of inflammation of any one of the constituent tissues of the lungs. On the contrary, a multitude of facts prove that the deposition of tubercles is chiefly the result of a general state of the frame; that it generally takes place without pre-existing inflammation, and that, when inflammation, or either of the affections just mentioned coincides with the tuberculous malady, it is posterior in its origin. The chief exception which may be taken to this inference, in which LAENNEC confided, is the occurrence of chronic or sub-acute inflammation of the lungs in scrofulous persons, the exudation taking place in the inflamed organ becoming the blastema of the tubercular formation.

CHAP. II.

DESCRIPTION OF PULMONARY CONSUMPTION.

9. IN describing tubercular consumption, or phthisis pulmonalis, I confine myself to the phenomena produced by the formation of tubercles in the lungs, although I do not overlook the fact that tubercles often exist in other organs when they are formed in the lungs, especially in children and young subjects. Of this circumstance notice will be taken in the sequel. Pulmonary phthisis may be viewed as a vital blight, which in the animal kingdom as in the vegetable, affects the circulating fluids by attacking the organs of assimilation and respiration. Numerous vital and physical causes, severally or concurrently, produce this result; whilst many influences, occasioning either excessive waste or imperfect supply of assimilating or nutritious elements, exert a similar effect.

10. *Phthisis* may represent numerous variations in its course. M. LOUIS states that he has seen it prove fatal within a period varying from three months to twenty years; and the tendency of the disease to cause a simultaneous or successive formation of tubercular in different parts of the system is one of the chief reasons of these variations. I have met with cases, the duration of which has been very much longer than that just now mentioned, and I will make a more particular reference to them in the sequel. The very different or varied occurrences and lesions, which may take place in the early course or advanced progress of phthisis, independently of the influence of *diathesis* and *temperament*, are such as to vary most remarkably the character of this disease. The development of tubercles in different tissues and organs; the progress of tubercular deposit, and the form of tubercles; their softening, and the excretion or absorption of the tubercular and morbid matters; intercurrent inflammations, bronchial irritations, or pleuritic attacks; the occurrence of hæmoptysis, its frequency or amount; attacks of laryngitis, tracheitis, or ulceration either in those situations, or in the bowels, with many other contingencies, either severally or in combination, impart a marked diversity in the characters, course, and duration of this malady. In order, therefore, that these variations, with their most frequent sources and contingencies, may receive sufficient attention, I shall notice — 1st. *The more usual form of tubercular phthisis*, — 2nd. *The*

latent form of phthisis, — 3rd. The primarily acute form of phthisis, — 4th. The consecutively acute form, — 5th. The protracted form of phthisis, — 6th. Of phthisis in infancy and childhood, and 7th. Of phthisis in the dark races.

11. Having considered the *forms or variations* of the disease I shall afterwards take a brief view of the *complications and intercurrent lesions* which may appear in the course of these forms, more especially of — 1st. *Bronchial irritation and inflammation; — 2nd. Hæmoptysis in its several states; — 3rd. Inflammation, ulceration, œdema, &c. of the larynx, trachea, &c.; — 4th. Inflammations or congestion of the lungs, or of the parts surrounding tubercular deposits, &c. — 5th. Inflammations of, effusion from, and adhesions of the pleura; — 6th. Perforation of the pleura, pneumathorax, and hydro-pneumathorax; — 7th. Diseases, especially ulceration of the intestines; — 8th. Fistula in ano; — 9th. Disorders of the uterine functions and organs; — 10th. Diseases of the kidneys and urinary organs generally, and their consequences; — 11th. Diseases of the heart and pericardium; — 12th. Abnormal states of the blood and blood-vessels, at the commencement and at the successive stages of phthisis.*

i. OF THE MORE USUAL FORM OF TUBERCULAR OR PULMONARY CONSUMPTION.

12. At its commencement phthisis may be manifest to the close observer, or it may be inferred with uncertainty, or detected with the greatest difficulty. But, as it advances, it generally becomes evident to the most careless observer. The diagnosis, however, should have reference not merely to the existence of this disease, but also to the progress it has made, as shown by the nature and combination of the symptoms and signs during its course. The division of its course, therefore, into *periods or stages*, according to the inferred progress and extent of the pulmonary and associated lesions and to the nature of the symptoms, is of much importance, not only as imparting a greater precision of description, but as suggesting more appropriate indications and means of treatment.

13. A. FIRST STAGE. — *a.* In some cases before the respiratory functions indicate any disorder, but in others either contemporaneously with, or soon after, such disorder, the habit and appearance of the body evince more or less of falling off from the healthy condition. Cough and shortness of breathing, slight at first, and hardly

observed, are early experienced. The cough is at first short, slight, occurring only in the morning when leaving the bed, consisting only of a slight hack, and afterwards recurring only occasionally or more and more frequently in the course of the day, or upon exertion. It is at first dry, or attended by a slight ropy or saliva-like fluid. The respiration, either previously, subsequently, or about the same time, is quick or hurried on the slightest exertion; and becomes more remarkably short, as the cough continues or becomes frequent. At this period, or even previously to either cough or shortness of breathing being experienced, the patient's spirits, in some cases, are much depressed, and the pulse is weak and slow. This is more particularly remarked when the disease is produced or determined by exhausting or depressing causes, as masturbation or depressing mental emotions. In many cases, the pupil of the eye is much dilated, and the conjunctiva pale or pearl-like. Pallor of the countenance and a deficiency of the healthy carnation tint of the general surface are also often observed, whilst the flesh is softer than natural, and somewhat emaciated. There are a general indication of languor, and a want of the elasticity of mental and bodily health—an impairment of vital force, and of digestive and nutritive energy.

14. These symptoms may continue for some time, without making much progress, or they may become more marked, but they are, after a longer or shorter time, according to the states of season, weather, climate, and numerous other influences, followed by greater and more general disturbance. The pulse becomes quicker than usual, especially towards evening or after meals. A chilliness, or sense of coldness, going down the spine, is experienced early in the day and again towards evening, followed by an increased heat of skin, the evening chill and heat being most complained of. The febrile paroxysm at noon may be slight, and thus overlooked, but that in the evening is attended by greater heat of skin, particularly of the palms of the hands and soles of the feet, which continues during the night, perspiration occurring towards morning. Owing to this febrile condition the patient is restless, and sleep is less sound and refreshing; cough often occurring during the night, when turning in bed, and as the disease advances. The patient readily flushes on any excitement, or after a full meal; and a tightness or oppression of the chest, or transitory pains, especially near the collar bones, are often experienced. The bowels are not much disordered, or are somewhat confined; the urine is not materially affected. The female discharges are at this stage

not necessarily deranged; but they may be either excessive in quantity or frequency, or they may be scanty, difficult, or suppressed, or replaced by leucorrhœa; these disorders often accelerating, the last affection sometimes delaying, the progress of the malady.

15. Climate and weather, aided by various circumstances, very remarkably influence the progress of this stage, especially when aided by judicious treatment. With the advance of spring and summer, in this and temperate countries, the malady often appears arrested, and the general health improved. The patient sometimes gains flesh and strength; but cough and shortness of breathing seldom entirely disappear; and as autumn advances and winter returns, they become exasperated upon the slightest exposure, or even without any known exposure, and the other symptoms also are aggravated, periods of exacerbation and of relief sometimes taking place irregularly, and tending to retard the progress of this stage, or even to carry it on to the following spring and summer, if the second stage have not previously supervened.

16. *b. This first stage* of pulmonary consumption corresponds with the first stage of tubercular development. The lungs at this period contain a greater or less amount of tubercular deposit in what has commonly been denominated a state of crudity. The tubercles are generally of two kinds*, the one more or less firm, *greyish*, and somewhat transparent; the other of a pale *yellowish* colour and opaque. At this stage, the adjoining pulmonary tissue and bronchial membrane may not have undergone any perceptible alteration, or these structures may present more or less redness or vascular congestion. If *hæmoptysis* have occurred in this stage, which is very frequently the case, and which I shall notice particularly hereafter, these changes are generally present in a more or less marked degree. The symptoms thus indicating the first stage of tuberculous phthisis chiefly are, diminished vital force, slight cough, shortness of breathing, languor, loss of the healthy colour of the surface, commencing emaciation and flabbiness of the flesh, slight hectic fever, and the state of the eyes already mentioned.

17. *c. The physical signs* in this stage are very often obscure. This, however, depends much upon the form in which the tubercular deposit exists in the lungs,—whether or no in that of isolated granules or as a continuous mass infiltrated through the structure

* See *Article on Scrofula and Tubercles*, in Dict. of Pract. Med., vol. iii. §§ 71, *et seq.*, pp. 774.

of the organ. Isolated tubercles may be so minute as almost to escape observation; or they may render portions of the lung impermeable to air, either by enlarging and approaching each other, or by the formation of more recent tubercles between them. While the solitary tubercles are separated from each other by healthy tissue, physical signs may be absent or obscure; but when portions of the lung are impermeable to air by infiltration of tubercular matter, or by the development of solitary tubercles, these signs are rendered more or less manifest, especially in proportion to the greater or less extent and rapidity of the respiratory movements. The quantity and quality of the secretions formed in the bronchial tubes have, however, great influence on the character of the physical phenomena.

18. *d. Solitary tubercles* do not, of themselves, produce the slightest change in the *percussion sound* of the lungs, even although they be scattered throughout the organ in considerable number. Any change of this sound depends upon an altered state of the portions of lung between these tubercles: the sound is tympanitic when the intervening tissue has not lost its contractility; but the infiltration of blood, serum, &c. into the tissue, whereby the air is expelled from it, renders the sound dull. As long as the intervening tissue continues normal the sound continues normal; but it is less sonorous, if the tissue be more dense and hypertrophied than natural. SKODA disputes the statement of DR. STOKES that solitary tubercles, when very abundant, produce a somewhat dull percussion sound. When they do so, the intervening tissue is then most probably congested, or infiltrated.

19. *e. On Auscultation* the signs of *solitary tubercles* are often indefinite, owing to their number, development, and the state of the bronchial mucous membrane. The inspiratory murmur may be distinctly or loudly vesicular, or it may be indistinct or altogether inaudible, though unaccompanied by râles, or sounds, or whistling, or sonorous sounds. Râles or sounds of every kind, as well as whistling and sonorous, may be mixed with the vesicular or indeterminate inspiratory murmur, or râles or whistling sounds alone be heard. The expiratory murmur may be altogether inaudible, or as loud and strong as that of inspiration, and like this, be associated with râles, and whistling, and sonorous sounds, or it may be undulatory, or interrupted, or tremulous.

20. As the deposit of tubercular matter increases, "and in many cases even at its first deposition, swelling of the bronchial mucous membrane, accompanied or not by secretion, takes place, and then

the same auscultatory signs appear as those described under the head of catarrh. The slow development of tubercles almost invariably takes place in the upper parts of the lungs, and hence, in such cases, we frequently find the auscultatory signs of catarrh permanent there, the respiratory murmur being elsewhere healthy. Rapidly developed tubercles, however, do not manifest themselves in the first instance at the apices of the lungs, but are frequently scattered equally throughout the whole of a lung, or of one lobe.* I agree with SKODA in believing that there are no distinct signs by which the existence of acute miliary tubercles can be inferred. Dr. STOKES states that "if in a case presenting the signs and symptoms of severe bronchitis, or in which we observe a crepitating râle continuing without intermission, we find incomplete dulness over a considerable extent of the surface of the thorax, unaccompanied with bronchial respiration; and if the stethoscope shows that the lung is almost everywhere permeable to air, and obstructed only at certain places, or if the crepitation be too feeble to account for the dull percussion sound, we may diagnose the acute inflammatory development of tubercle." According, however, to my experience, most cases of acute tuberculosis are unaccompanied by any of those signs, and every one of them may be present without the disease being tubercular.

21. *f. Tubercles in Masses and Tubercular Infiltration.*—*a.* In by far the greater number of cases of tubercular disease of the lungs, of some duration, the *percussion sound*, under one or both clavicles is duller than natural, or is completely dull, whilst over the other parts of the thorax the sound is normal, or louder, or duller than ordinary. This is owing to the conglomeration of tubercles in the upper parts of the lungs, where they are slowly developed, increase in size, and, coming in contact with each other, form considerable masses. Generally, when the sound under the clavicles is duller than natural, it is abnormally loud in the natural regions of the thorax, the lower part of the lung being more than usually distended, owing to respiration being impeded above. Acute tubercular infiltration takes place most frequently in the upper lobes of the lungs. It produces the same percussion sound as hepatisation.

b. Chronic tubercular infiltration may, however, take place in other and lower parts of the lungs, but most frequently in the upper parts of one or both lungs, or it may commence in the

* *A Treatise on Auscultation and Percussion by Dr. Joseph Skoda; translated from the fourth Edition, by W. O. Markham, M.D., p. 300.*

latter, and extend to the former portions and proceed latently, producing neither cough nor shortness of breathing, until, owing to exposure to cold or to some other cause, or to the great extent of tubercular formations, the pleura is implicated, when the pain thereby caused occasions alarm, and the nature of the malady then is manifested by percussion and auscultation. These cases are most frequently met with in the scrofulous diathesis, and in some, the progressive emaciation is the only indication of mischief, neither the pulse nor the existence of any of the symptoms mentioned above (§§ 17 *et seq.*), evincing disorder.

In some of the more chronic cases, especially in the scrofulous, and even though the tubercular infiltration be seated somewhat low in one lung, the morbid formation may proceed to a very great extent before pain, fever, cough, or shortness of breathing is complained of; the functions of the skin, stomach, and bowels, being natural, and continuing so until consecutive partial pleuritis or hæmoptysis supervenes, or until the second stage, depending upon softening of the tubercles and absorption of their elements, takes place. In certain of these cases, however, the commencing emaciation, the appearance of the eyes, particularly of the conjunctiva and pupils, the occasional flushings or chills, alarm the close observer, and a careful physical examination detects the mischief.

22. *g. Auscultatory Signs.*—As long as the tubercular mass, or the tubercular infiltration, is of such limited extent as not to contain within it at least one large bronchial tube, it will not give rise either to bronchophony, or to bronchial breathing, or to any consonating sound. “Vesicular respiration may continue audible beneath the clavicles even when tolerably large masses of tubercles are present in the upper lobes of the lungs, provided there be sufficient healthy tissue to produce it, and the bronchial mucous membrane be not swollen nor covered by secretion. But this is not generally the case, for we almost invariably hear an indeterminate inspiratory murmur, of different degrees of strength, often, indeed, very strong, and in most cases attended by moist râles, or by hissing, whistling, and sonorous sounds; the expiratory murmur is nearly as loud, or even louder, than the inspiratory, and is likewise combined with different kinds of râles, and whistling and hissing sounds.” (*Op. cit.* p. 302.)

23. If the tubercular masses or infiltration be of such extent as to embrace bronchial tubes, in which the voice or the respiratory murmur can consonate, bronchophony and bronchial breathing will be heard beneath the clavicles, provided the tubes are not filled

by fluid or solid exudations; and should there be any râles, or whistling or sonorous sounds in the trachea, or in a large bronchial tube, consonating râles, or whistling or sonorous sounds, will also be heard. But if the bronchial tubes in question be obliterated, neither bronchophony, nor bronchial breathing, nor any consonating râles, will be audible, these being replaced either by indeterminate respiratory murmurs, with or without dull râles, or no murmur whatever. It is often observed, owing to the bronchial tubes being at one time filled or obstructed by mucus, and at another freed from it by coughing or expectoration, that in the course of a few minutes bronchophony is heard alternating with a dull resonance of the voice, bronchial respiration with indistinct breathing, and a clear acute with a deep dull r  le, &c. Consonating and non-consonating sounds may be also heard at the same time.

24. Should the tubercular masses or infiltration not be developed in the upper lobes, the respiration beneath the clavicles may be quite natural; auscultatory signs being presented over those parts of the chest which correspond with the affected portions of lung. The parts which are healthy, or which contain only solitary tubercles, yield either a weak or loud vesicular indeterminate respiratory murmur; or every variety of r  le and whistling and sonorous sounds may be audible, according as the bronchial tubes are or are not free from catarrhal affection. In *this stage of the disease* it may be stated that there are no auscultatory signs truly indicating, or pathognomonic of, tubercular disease of the lungs; and there are none which will enable us to determine that no tubercle is present in a lung, or in any part of it.

25. *h.* Of the *physical signs* in this stage, it may be said that, unless there is an obvious difference between the sounds emitted in the relative situations on opposite sides, these signs are not much to be depended on; and in very many cases an opinion as to the disease has to be formed chiefly from the local and constitutional symptoms. In other cases, with the same symptoms, the physical signs afford unequivocal indications of the existence of tubercular disease. The sound elicited by percussion is evidently less clear under one clavicle; the respiration less soft and easy, and the voice decidedly more resonant, than under the opposite clavicle. And, even at this early period, the motions of the upper parts of the chest during respiration may often be seen to be unequal; one side of the thorax being more fully expanded during inspiration than the other, the side least elevated being generally that which furnishes the most evident signs of the presence of tubercles.

When tubercles are diffused over a large portion of the lungs, a degree of puerile respiration occasionally indicates their presence. A marked inequality in the sound of the respiration in different parts of the chest also affords strong suspicion of tubercular disease, when such inequality cannot otherwise be accounted for.

B. SECOND STAGE.

26. *a.* The transition from the first to the second stage may be gradual and hardly manifest, or it may be rapid and evident. It is indicated chiefly by a change in the expectoration. The expectorated matter, instead of being colourless, slightly greyish and frothy, either becomes muco-puriform and contains specks or streaks of blood, or presents minute specks of opaque matter, of a pale yellow or whitish colour. These specks gradually increase in number and in size, until they form curdly patches, surrounded by the transparent portion of the expectoration. The increased sputum is accompanied with more frequent, often more severe cough; the chills or sense of cold running down the spine, the evening heat of skin, the restlessness in the early part of the night, and the morning perspiration, although more severe on some days than on others, or on alternate days, become more remarkable; and hectic fever is unmistakably established. The pulse is always accelerated, more especially in the evening; the respiration quick, although the patient be at rest; and the emaciation and flabbiness of the flesh increase. Languor, debility, and an inability of bodily and mental exertion, are experienced. The face is generally pale in the morning, but it becomes flushed after a meal, and in the evening, when the fever and heat of skin are present, the flush in the cheeks being more and more circumscribed as the disease advances. The pains sometimes complained of in the first stage are more frequently felt in this; and are referred most commonly to the vicinity of the collar-bones, or to one or both shoulders, occasionally to either side, and not infrequently to the back, or to one side of the upper half of the sternum. The pain is generally dull or aching, resembling chronic rheumatism; but it is sometimes acute, especially when it is referred to either side, and is then owing to the extension of inflammatory action, of a sub-acute or chronic form to the pleura. Before, in some cases, and more frequently after, this stage is formed, slight or more decided hæmoptysis occurs. In many instances the expectoration is merely streaked with blood, in others the blood is discharged in considerable or large quantity, and unmixed with the sputum.

27. *b.* These *constitutional symptoms* are occasioned by the *softening* of the tubercular matter, and by the changes in the parenchyma of the lungs, and in the bronchi which attend it. The softened and diffuent matter, forming the expectoration, proceeds from the dissolution of the tubercles, from the tissues surrounding them, and from the bronchi, into which the softened tubercles open, and along which the softened matter passes, in the course of its excretion. The bronchi and tissues surrounding the tubercles, irritated by the morbid matter, furnish an increased and altered secretion, which, with the softened tubercular matter, constitute the sputum; and this varies in character with the extent and intensity of the inflammatory irritation induced by this matter in the adjoining tissues and in the bronchi. The cough depends upon, and is modified by, the amount and properties of the matters proceeding from these sources, and the degree of irritation thereby produced in the trachea and larynx. While these changes are proceeding in the earlier tubercular deposits, and in the adjoining structures, the inflammatory irritation thus induced extends to the pleura covering the portion of lung chiefly affected, and lymph is effused from it. The exuded lymph, coming in contact with, and irritating, the surface of the costal pleura opposite, gives rise to adhesions, which become cellular, and vary in firmness and extent with the duration and severity of the disease. These pleuritic adhesions are generally greatest over, or are confined to, the parts where the tubercular deposits are greatest; and, especially owing to the inflammatory action producing them, account in great measure for the pains experienced in the upper and lateral regions of the chest. The consequences of the softening and breaking down of the tubercles are the formation of *cavities* and various *changes* in the adjoining tissues and in the bronchial tubes. These cavities are first formed in the superior lobes, whilst the lower portions of the lungs are gradually becoming tubercular, the disease generally advancing downwards.

At the commencement, or even through a great part of the course, of this stage, the softened or diffuent tubercular matter may not find an exit by the bronchi, but become partially absorbed into the circulation, or form small vomicae in the substance of the lungs. In these cases there will be but little cough and less expectoration; but the febrile symptoms will be more marked or severe, and the progress of the malady more rapid, the absorption of the morbid matters into the blood increasing the severity of the constitutional symptoms, which vary with the peculiarities and circumstances of

individual cases. Ultimately cavities are formed; the softened tubercular matter generally finds its way into the bronchi, and is partially or more completely expectorated with the secretion furnished by the irritated bronchial surface, and the disease passes into the next stage. In some cases, during the second stage the absorption of the softened tubercular matter develops tubercles in the intestinal surfaces, glands, and membranes, and occasions irregularity of the bowels, diarrhoea, and colicky pains, rapid emaciation, &c.

28. *c.* The *cavities* may be formed by the dissolution of either solitary tubercles, or of conglomerated tubercles, or of tubercular infiltration. They are of all sizes, from the size of a pin's head to that of a large orange, or even larger. Their walls consist either of the lung-tissue infiltrated with tubercular matter, forming a more or less dense layer, and being in some cases of such firmness as to prevent any dilatation or contraction of the cavity, or merely of a membrane, or membrane-like sac, attached to the surrounding tissue of lung. In very old cavities the internal cavities often present a more or less dense, polished or smooth, and serous or sero-fibrous surface, whilst in others recently formed the surface varies, in firmness or softness, presenting neither of the appearances just stated, in any marked form. Between these the changes of the surface are very diverse, according to the size and duration of the cavity. The cavities generally communicate with one or more of the bronchial tubes; and are rarely free from puriform mucus, or from pus, or an ichorous pus, or from blood. Owing to these differences in the size, in the walls and contents of the cavities, as well as in the surrounding structures, and to other circumstances, the physical signs which cavities present are very different and varied.

29. The extent to which the lungs have become tuberculous varies, in this stage of phthisis, very remarkably in different cases, without a corresponding difference in the severity or duration of the symptoms. Two patients having symptoms exactly similar, may be the subjects of a very different extent of pulmonary disease. In some cases a few weeks may suffice to develop cavities of greater or less extent, while in others many months, or even years, may pass without any remarkable increase or diminution of the symptoms, or even of the pulmonary lesions. In a small proportion of cases a curative process is established, as will be noticed in the sequel, by which the tuberculous changes are arrested or partially obliterated; and if the patients' general health be maintained, the indications of tubercular deposit may gradually disappear, or at least advance no further. But by trusting to symptoms

alone, the state and progress of the tubercular lesions, without having due reference to physical signs, cannot be ascertained with any degree of precision. It must be evident, however, that a degree of importance beyond that which these signs possess should not be accorded to them, and that the fallacies to which they are liable should be duly estimated.

30. *d. Physical Signs.*—The upper parts of the chest are at this period less freely raised during inspiration than in the healthy state, and this is often more evident on one side than the other.—

a. The sound on percussion is dull under one or both clavicles. When the cavity is formed within a portion of air-containing or healthy tissue, the percussion sound remains but little or not at all changed; and this is true not only of a small, but even of a tolerably large cavity. The only sound which cavities situated within a healthy structure yield is the cracked-pot sound, but this only in rare cases, where the cavity approaches the walls of the thorax, contains air, and is not smaller than a pleximeter. The sound in these cases is more tympanitic over the situation of the cavity than at other parts of the chest. Cavities containing air, even when deeply seated within a portion of lung infiltrated with tubercular matter, will emit a tympanitic sound if their size be not less than a walnut. Several small cavities, seated close together, will produce the same sound. The more flexible and moveable the walls of the thorax, the more readily is the tympanitic sound emitted. The sound is clearer the nearer the cavity is seated to the surface of the lung, and fuller the larger the cavity. The cracked-pot is most readily heard when cavities are large and superficial. "A cavity will not yield a metallic ringing sound unless it be the size of a fist, but it does not necessarily emit such a sound, though it be of that size."

31. *e. On Auscultation*, a dry or large-bubbling crepitant râle is heard over large cavities, when their walls are yielding, and dilate and contract during respiration, the lung being attached to the costal pleura. This râle is most readily heard when there are several or many cavities, of the size of a pea or bean, scattered through the lobe; it is never heard alone, but in combination with other râles or whistling or sonorous sounds, owing to the presence of muco-puriform or other morbid exudations in the affected portion of lung, or its vicinity. If these latter be very loud the crepitation may not be heard. SKODA observes that when a few deep-seated cavities are present in a lung which is otherwise healthy, the vesicular breathing, interrupted by a few bubbles of a muffled râle,

may be heard over them; generally, however, the murmur in such cases is not vesicular, but indeterminate. "Cavities with membranous walls, situated in the midst of air-containing tissue, even though of large size, never give rise to bronchophony, bronchial breathing, or consonating râles." These râles and whistling and sonorous sounds may take place in cavities, the walls of which have a thickness of at least several lines; and if their thickness be considerable, the breathing and the voice may be accompanied by metallic tinkling and amphoric resonance. When the walls are thick and unyielding, there is neither increase nor diminution of the size of the cavity during inspiration and expiration, the air neither entering into nor passing out of the cavity, and consequently no murmurs are emitted from the cavity; those which appear to proceed from it are *consonating murmurs*. But murmurs may be produced within the cavity, if its walls are flexible, and permit the entrance and exit of air during respiration, especially if adhesions of the pulmonary with the costal pleura exist over or near to the cavity. Râles and whistling sounds can be produced in a cavity only when the current of air is interrupted by the morbid secretion contained in it, or in the bronchial tubes communicating with it. The movement which this secretion undergoes during inspiration, and especially during coughing, is attended by râles, or by whistling sounds, when air as well as fluid is present in the cavity.

32. From the above, and owing to the varying sizes, to the situations, to the walls, to the contents, and to other circumstances, of cavities, it must be manifest that *percussion* and *auscultation* afford but few certain signs of the existence of cavities. In this opinion, I am fortified by that of SKODA—the most experienced observer of physical signs in Europe. I may remark, however, that tubercular masses and tubercular infiltrations do not exist for any considerable time without producing cavities. Cavities may, therefore, be safely inferred to be present whenever the tubercular disease is of considerable standing, and when the constitutional symptoms mentioned above have existed for some time. SKODA justly remarks that "loud bronchial breathing, loud large-bubbling râles and bronchophony are often heard over cavities; but we as often, and oftener indeed, meet with cavities which do not reveal themselves to us by auscultatory signs." The difficulty of ascertaining the existence or non-existence of ulcerated cavities in the lungs in the advanced course of this stage, as well as in the last stage, depends not only on the circumstances connected with these cavities, their size, seat, &c., but also upon the amount of

softened tubercular matter, or of morbid secretion or exudation which they may contain at the time of the physical examination. If the cavities be small and more or less full of the morbid formation or secretion, the signs of their existence may be absent, although they may furnish more or less indications of their presence when the examination is made when their contents are less, or have been evacuated into the bronchi, or have been absorbed into the circulation.

C. THIRD STAGE.

33. This period of the disease is merely the former gradually increased in severity—the second gradually lapsing into this. But during its progress various complications, and additional phenomena, present themselves, caused by the extent of lesions in the lungs—the increase of cavities, formation of additional ones, and more extensive tubercular deposits; by the contamination of the circulating fluids, and by disease of related or remote organs. —*a.* The thorax at this stage is generally flat instead of round or prominent; the clavicles appear remarkably prominent, owing to the depression of the ribs, to a hollow space existing between them and the upper ribs, and to the shoulders being raised and brought forwards. The sub-clavicular regions are nearly devoid of motion during respiration; and during a *full* inspiration, the upper regions of the chest seem to be raised forcibly instead of expanding with the elasticity and ease of health.

34. *b.* The *constitutional symptoms* are still more severe than in the former stage. The pulse becomes quicker and weaker; the hectic symptoms more pronounced; the flush in the cheeks more marked and circumscribed, particularly in the evening; the emaciation and debility greater; the cough and expectoration more frequent, especially at night and during the morning, and the breathing shorter and more oppressed. During this stage, the patient is exhausted by copious perspirations and attacks of diarrhoea, the one sometimes alternating with the other. These assume a colliquative character, and their accession at the commencement of, and continuance during, this stage, have led to the denomination of *Colliquative stage*, which has usually been applied to it. In addition to these, the feet and ancles often become oedematous; the nails of the fingers, if not before, are now incurvated; the cough and restlessness during night increase; copious perspirations break out as soon as the patient falls asleep; pains in

the chest, collar-bones, and shoulders, or in the sides, are much complained of. The sweats and colliquative diarrhœa rapidly increase the emaciation, the integuments covering the more prominent parts of the back becoming inflamed, sore, and liable to ulceration from the pressure to which they are subjected. Nevertheless, the patient's appetite is often not materially diminished, and hopes of recovery are generally entertained nearly unto the last. With the emaciation and exhaustion, the mind becomes enfeebled, although the imagination is often active. During the last few days or weeks of existence, the mouth, tongue, or throat, or all these, become aphthous; the features sunk, collapsed, and sharp; and, in some cases, mild delirium, very rarely violent delirium, followed by sinking or coma, closes the scene.

35. The severity and rapidity of the symptoms and progress of the malady vary remarkably in different cases. In some a progressive wasting, with little pain, without much cough, but with diarrhœa and perspiration, in the last stage is chiefly observed; sanguine hopes of recovery being entertained. In others, and these the majority, the chills and sinkings following the perspirations during the night and mornings; the exhaustion and distress produced by the diarrhœa, the harassing cough and difficulty of expectoration; the dyspnœa and sense of suffocation; the pains in the chest, and sometimes in the bowels; the mental struggle between hope and fear, especially in the latter part of this stage, mark not only the severity of the disease, but also the distress experienced by the patient. The termination of the malady is thus characterised by a state of tranquillity, ease and gradual sinking, in some cases, and by a painful and distressing struggle in others.

36. *c. The Physical Signs* are generally the same as, or more fully pronounced than, in the second stage. *Percussion* generally emits a dull sound over the superior parts of the chest, although the excavations which partially occupy the upper lobes, and the emaciated state of the parietes, may render the sound less dull than in the preceding stage. On *auscultation*, the respiration is obscure in places, or even inaudible, whilst in others it is particularly clear, bronchial, or tracheal, or the cavernous of LAENNEC. There is a mucous râle, produced by the morbid secretion in the bronchi; and a gurgling sound on coughing; pectoriloquy is frequently distinct, although as often absent, in one or both sides, or present at one time and not at another.

37. *Pectoriloquy*, or the resonance of the voice in a cavity existing in the chest, is one of the most uncertain signs in this

and the second stage, for the reasons stated above (§§ 26 — 36). Various indeterminate sounds are also heard in different parts of the chest, often with the signs of pleuritic, pulmonary, or bronchial inflammation.

CHAP. III.

OF CERTAIN SYMPTOMS AND SIGNS DIAGNOSTIC OF PULMONARY CONSUMPTION.

THE diagnosis of pulmonary phthisis is usually easy in the second and third stages, but often difficult in the first; for in this the physical signs furnish no more certain aid than the constitutional symptoms. Various aids, however, to the diagnosis have been recently recommended.

A. THE RESPIRATORY FUNCTIONS may be expected to furnish early indications of the existence of tubercular formations in the lungs; and they do furnish these in most cases, if duly observed, although not uniformly.

38. *a. Quickness of Respiration* is one of the earliest indications of phthisis, especially when occurring in connection with a hacking or short cough, (§§ 13 *et seq.*). It has generally a marked relation to the quickness of pulse, and the severity of the febrile symptoms; in the more latent and chronic states of the disease it is not experienced unless more or less physical exertion be used; but on ascending a height, or on other occasions of exertion, the breathing is not only quick, but is also attended by more or less dyspnoea and sense of oppression in the chest. As the malady advances, especially in its more febrile forms, and when cough and expectoration are considerable, respiration is very quick, the acceleration being much greater in proportion to that of the pulse than in health or at an early stage; and the sense of oppression and dyspnoea are also greater. These symptoms are evidently caused by the extent to which the lungs are rendered incapable of their functions — to which the capacity of the organ to receive and hold air is impaired by tubercular deposits, by condensation of portions of the pulmonary structure, and by sanguineous congestion of other parts; the occurrence of hæmoptysis, by removing the latter morbid states, often relieving the cough and the breathing for a time. The state of the heart's action, an impaired contraction of its parietes, distension of its cavities owing to impeded circulation through the lungs, may severally also increase the pulmonary con-

gestion, and the oppression and quickness of respiration, and favour or even occasion an attack of hæmoptysis. In many cases, quick or difficult breathing is not experienced until after an attack of hæmoptysis. In these it may be inferred that the hæmorrhage either increases the weakness of the heart's action, and favours congestion of its cavities, or infiltrates the bronchi and air cells, or structure of the lungs, so as to impair the capacity of the organ for the reception of air; an increased frequency of respiration being consequently required to make amends for the diminution of capacity. In all cases, therefore, the state of the respiration should receive attention, and the cause of its increased frequency or its difficulty ascertained, particularly as respects the existence of lesions within or without the lungs—in the bronchi, air-cells, and pulmonary tissue, or in the cavity of the pleura, or in the heart.

39. *Observations of the time during which the breath may be retained after a full inspiration* have been recommended, (the patient being sometimes desired to count as far as he can), in the first stage of phthisis, in order to assist the diagnosis, and are of some use when carefully made; but the results vary so much in different persons in health, and still more so in other diseases of the chest, which are not strictly consumptive, as emphysema, chronic bronchitis, chronic pleurisy, and pleuritic effusions, diseases of the heart, &c., that little dependence can be placed upon them, unless when viewed in connection with the existing phenomena and with the absence or presence of the symptoms and signs of these diseases.

40. *b. Observations by the Spirometer* are in some degree liable to the same objections as those just now stated. This instrument, invented by Dr. HUTCHINSON for ascertaining the capacity of the lungs for air in diseases, may however be used in incipient phthisis with some advantage, but it can be employed only in public institutions. The indications of the extent to which the lungs are obstructed by tubercular deposits, must necessarily have reference to the average capacity of the lungs, of persons of the same size, in health. Consequently it was requisite to ascertain this latter point in the first instance; and he found, after a very great number of observations of the capacity of the lungs for air in persons in health, that this capacity increased with the height of the individual in a very determinable proportion. To this part of the subject it is unnecessary further to refer, than to state that the "vital capacity of the lungs for air" was inferred from the average of upwards of a thousand persons in health, whose lungs were thus measured. *The following table shows the comparison of healthy*

lungs, and of lungs in the first stage of phthisis, or before softening, all cases being males :—

No. of Cases.	Age.	Height.	Vital Capacity.		Difference.
			Healthy.	Diseased.	
		ft. in.	cub. in.	cub. in.	cub. in.
1	28	5 8	238	186	52
2	28	5 4 $\frac{1}{4}$	206	140	66
3	37	6 2 $\frac{3}{4}$	286	270	16
4	20	5 3 $\frac{1}{2}$	198	120	78
5	27	5 7	230	85	145
6	45	6 0 $\frac{1}{2}$	270	200	70
7	36	5 6 $\frac{1}{2}$	222	182	40
8	36	5 5 $\frac{1}{2}$	214	170	44
9	35	5 7	230	160	70
10	38	5 10 $\frac{1}{4}$	254	140	114
11	33	5 7	230	80	150
12	28	5 7 $\frac{1}{2}$	230	180	50
13	27	6 1 $\frac{1}{2}$	274	260	14
14	24	5 6 $\frac{1}{4}$	222	190	32

Cases Nos. 5, 10, and 11, present a great deficiency. In these both sides of the lungs were much diseased, and in the two former emphysema also existed to a considerable extent. The foregoing table, as well as the following, are taken from "*The Medical Report of the Hospital for Consumption.*" The next table shows *the comparison of Healthy and Diseased cases in the second stage of Phthisis, or after softening, all being males :—*

No. of Cases.	Age.	Height.	Vital Capacity.		Difference.
			Healthy.	Diseased.	
		ft. in.	cub. in.	cub. in.	cub. in.
1	27	5 6	214	86	128
2	21	5 5 $\frac{1}{2}$	214	60	154
3	45	5 9 $\frac{1}{2}$	246	85	161
4	30	5 6 $\frac{3}{4}$	222	70	152
5	33	5 8 $\frac{1}{2}$	238	70	168
6	26	5 6 $\frac{1}{4}$	222	50	172
7	28	6 0	262	70	192
8	38	5 8	238	60	178
9	41	5 9 $\frac{3}{4}$	246	90	156
10	42	5 8	238	60	178
11	29	5 5 $\frac{1}{2}$	214	50	164
12	32	5 7	230	70	160
13	42	6 0	270	140	130
14	29	6 2	286	150	136

All the cases in the above table show a very marked deficiency of vital capacity. In Nos. 3, 7, and 8, and probably in

others, both lungs were extensively diseased. In the following table "*the vital capacity of phthisical patients is exhibited, indiscriminately, without reference to the stage of the disease, compared with that of the same number of healthy individuals:*"—

No. of Cases Observed.	Mean Vital Capacity.		Difference.	Difference per cent.
	In Health.	In cases of Phthisis, all Stages.		
415	cub. in. 222	cub. in. 129	cub. in. 93	cub. in. 42

The following table shows the comparison of healthy individuals and of cases of phthisis in the first stage, or before softening:—

No. of Cases Observed.	Mean Vital Capacity.		Difference.	Difference per cent.
	In Health.	In Phthisis, 1st Stage.		
241	cub. in. 223	cub. in. 149	cub. in. 74	cub. in. 33

Table showing the comparison of healthy persons and cases of phthisis in the stage after softening.

No. of Cases Observed.	Mean Healthy Capacity.	Mean Diseased Vital Capacity.	Difference.	Difference per cent.
174	cub. in. 221	cub. in. 105	cub. in. 116	cub. in. 52

41. *C. Hæmoptysis, or Bleeding from the Respiratory Organs*, is so generally connected with pulmonary consumption as to require a particular consideration of its relations, not only to tubercular formations, but also to other structural lesions. The very extensive vesicular and bronchial surfaces to which the blood is circulated for the purpose of oxygenation and other requisite changes during respiration, and the delicate conformation of the capillary vessels of these parts, render hæmorrhage from them not only a frequent, but also a more or less dangerous occurrence. The intimate connection of hæmoptysis with consumption, and the great frequency of this connection, suggest the inquiry, What are the lesions of structure, in addition to tubercular formations, which occasion this very important symptom? Experience, aided by inspection after death,

has shown that partial or general congestions of the lungs and respiratory surfaces, owing to impaired vital power, or to other changes in this organ; that obstructions of the pulmonary veins, and of the circulation through them; that valvular or other diseases of the heart, or diseases of the large vessels near the heart; that inflammatory congestion of a lung or portion of a lung, or of the bronchial surface, may severally occasion more or less exudation of blood or hæmorrhage; but much more rarely than tubercular formations in the lungs, and the alterations of structure which they produce. As hæmoptysis is so often an early, an important, and an alarming, even though not often a very dangerous, symptom of pulmonary consumption, it becomes requisite to consider it more fully.

42. (a.) *Symptoms preceding and attending Hæmoptysis.*—a. Hæmorrhage from the respiratory organs may occur unexpectedly or suddenly, and may appear immediately upon, or soon after, more or less of physical exertion. When it thus takes place as well as on some other occasions, it may not yet be preceded by any marked indication. When, however, circumstances admit of the occurrence, or of the appearance, of premonitory symptoms, they are chiefly chills, or horripitations of the general surface, sometimes followed by redness and heat of the face, or flushings of the cheeks; a feeling of internal warmth, particularly in the chest; pain or tension at the epigastrium or hypochondriæ; a burning sensation under the sternum, with more or less anxiety, inquietude, constriction, or oppression at the chest, or dyspnœa; a short, dry cough; dyspnœa, or shortness of breath on slight exertion; a dull pain or soreness under the sternum, between the shoulders, or beneath the clavicles; palpitations; a quick, hurried, or excited pulse, which is sometimes also hard, full, bounding, or oppressed, &c.; headach, coldness of the extremities, with a collapsed or empty state of the veins of the surface; lassitude, and sense of weight of the limbs; occasionally cramps or spasms of the lower extremities; flatulence, or borborygmi, costiveness, and pale urine. A few only of these symptoms, or several variously modified, may be present in individual cases; they may exist for a longer or shorter time before the attack. In some instances, neither cough, nor difficulty of breathing, nor any symptom referrible to the chest, has been complained of; or it has existed in so slight a degree as to escape the observation of the friends of the patient; and yet the most extensive changes had taken place in the lungs, and caused the hæmorrhage. Several cases of this description have occurred in my practice, and similar

instances are not uncommon, as shown by RHODIUS, MÜLLER, WEDEL, GRAMBERG, the FRANKS, LOUIS, CLARK, and many others.

43. (b.) *Progress*.—As the blood rises to the larynx, a sense of titillation is felt in the trachea, or of irritation in the throat with dyspnœa; and a gurgling or bubbling sensation in the chest or trachea; and the blood is either hawked or coughed up, exciting a sweetish-salt taste. As soon as this occurs, much alarm is sometimes caused, particularly in delicate or nervous persons; and several of the general symptoms, particularly those connected with the action of the heart and pulse, are owing chiefly to this circumstance. When the blood is in considerable quantity, the discharge of it is attended with a feeling of suffocation; the chest is forcibly dilated, a convulsive reaction or cough follows, and this fluid is ejected from both the mouth and nostrils. In some instances the irritation at the top of the pharynx and in the fauces, excites retchings; and in others, the blood, as it collects in the pharynx, is instinctively swallowed; and, when it has accumulated in the stomach, causes vomiting; and gives rise to a suspicion, from this circumstance, and from the presence of portions of ingesta, &c. that the hæmorrhage is seated in the stomach. Occasionally the blood is brought up without any effort whatever, beyond a strong expiration, which it accompanies in a full stream; and when retching or full vomiting is occasioned in the manner just stated, another and often a greater discharge of blood from the lungs attends it.

The quantity thus discharged, varies from a few drops to many pounds. RHODIUS (*Obs. cent. ii. 31*) saw 23 lbs. lost in three hours; PEZOLD (*Obs. Med. Chir. No. 49*) and ZACCHIROLI (WEIGEL'S *Ital. Biblioth. b. iii. p. 154*) observed larger quantities during a much longer period. J. FRANK (*Prax. Med. &c. ii. 2. 1, p. 417*) had a patient who lost 192 ounces in twenty-four hours; and a friend of my own experienced nearly as great a discharge in the same time, and afterwards recovered. When the blood is not considerable as to quantity, it is frothy or contains bubbles of air, and is of a florid hue; when it is very abundant, it is fluid, generally more or less florid, but not frothy; it is seldom mixed with mucopuriform matter, unless it be small in quantity, and it then is often semi-coagulated, and of a darker or brownish tint; but towards the termination of an attack, this appearance is very common.—If the hæmorrhage is very great, extreme faintness, or even full syncope, may come on: but a sense of depression, or sinking, with a quick, sibilous, and short respiration; a small,

weak, interrupted, voice and speech; and coldness of extremities, are more commonly complained of. Occasionally, the least exertion of the voice, or of the body, or a fit of coughing, increases or brings back the discharge; but as often it returns without any such cause.

44. In some instances the attack is followed by great frequency of the pulse, and generally excited vascular action, with heat of skin, thirst, &c.; although the pulse had been perfectly natural before or at the time of seizure. In these the congestion of the substance of the lungs connected with the production of the hæmoptysis has passed into inflammatory action in one or several parts of the organ; or rather the infiltration of a portion of the effused blood through the smaller bronchi has excited inflammation of them, as demonstrated by the stethoscope and by dissection. In many cases, especially when the hæmorrhage occurs in weak or lax frames, and scrofulous or tubercular state of the lungs, not only the external discharge of the blood, but also its passage along the bronchi into the more depending parts of the organ, and even its infiltration into the substance of the lungs, or its effusion in the distinct form of pulmonary apoplexy, takes place, as I have several times recognised during life, and ascertained afterwards by dissection.

45. Only one violent attack of hæmoptysis may occur—the patient recovering perfectly, without suffering materially, after the immediate effects have passed off: but this is seldom the case; more or less disease of the lungs, although unapparent to the friends previous to the attack, following rapidly afterwards. Hæmoptysis rarely causes immediate death, or suffocates the patient, in an early stage of consumption, although it occasionally does so at a far advanced period. In some cases, particularly when tubercles have proceeded to softening, &c. without exciting much disorder, the hæmorrhagic congestion, infiltration, and atonic inflammation of the substance of the lungs, attendant and consequent upon the seizure, soon destroys life. In several instances, to which I have been called, the patients had pursued their usual avocations unconscious of ailment, been attacked by hæmoptysis, and died in three or four weeks afterwards in consequence of these associated lesions of the lungs. More frequently the hæmoptysis is followed by pulmonary consumption in a much less rapid form. When the blood is ejected in small quantity, or of a brown colour, or is mixed with a rose-coloured lymph, or mucus, latent inflammation or active congestion most likely will

be found to exist in the substance of the lungs; and this inference ought not to be doubted, if febrile symptoms, with cough, be present, or if the blood taken from the arm be buffed.—In a few instances, the lymph effused from the vessels towards the close of the attack is moulded into the form of several bronchi, and is expectorated in this state; in others, cretaceous or other earthy concretions, consequent on the degeneration, or the partial absorption, of tubercles, or even ossific matters, are brought up with the blood, or soon afterwards; but most frequently, and especially when the hæmorrhage is scanty, or towards its close, or after more than one attack, muco-puriform matter, with or without minute portions of softened tubercular substance, may be detected; and these become more manifest as the blood disappears.

46. Hæmoptysis may recur at irregular, or even at distant, periods; the patient experiencing but little ailment in the intervals, or presenting merely a marked susceptibility to congestion or inflammatory affections of the lungs. When supplemental or vicarious of suppressed or retained catamenia, or of the disappearance of hæmorrhoids or epistaxis, it sometimes returns periodically. In such cases, the evacuation depends more upon vascular plethora than upon serious lesion of the substance of the lungs, although this may also exist. Some instances of this constitutional recurrence of hæmoptysis have been observed, and yet a far advanced age has been reached.

47. (c.) *The appearances after death* comprise almost every lesion to which the lungs, heart, and large vessels are liable, but some of them are more immediately connected with hæmoptysis than others.—*Tubercles* are the most common of all these, in one stage or other of their progress, and frequently they are found in every stage, even in the same case—either disseminated through the lungs or clustered—in a crude, softened, and ulcerated state—in connection with small or large excavations,—in some instances, the seats of the softened and partially absorbed tubercular matter containing earthy or cretaceous concretions; and, in rarer cases, the parenchyma of the lungs around them presenting a cicatrised or puckered appearance. When hæmoptysis has been very recent, the lungs are frequently more or less congested, and their substance infiltrated with dark blood, both throughout many of the minute bronchi and cells, and in the connecting cellular or parenchymatous tissue, large portions of the organ exhibiting a spleen-like appearance. In some cases, portions of the lungs are more or less obviously inflamed, as well as tuberculated; the inflam-

matory appearances having been either antecedent to, or consequent upon, the hæmorrhage, most frequently the latter. In rarer instances, blood is effused in the substance of the organ, forming a distinct cavity filled with coagulated blood, and forming the pulmonary apoplexy of French pathologists.

48. Adhesions between the pulmonary and costal or diaphragmatic *pleura*, both old and recent, frequently exist. The bronchial membrane is generally injected, congested, and of a deep or dark red, or purplish or nearly black, either throughout a large extent, or in parts or patches; but the state and colour of this surface vary with the period at which hæmoptysis took place, and the mode in which the disease of the lungs terminated the life of the patient. In rarer cases, gangrene of portions of the lungs, or erosion or ulceration of one or more vessels connected with softened tubercles or cavities, is observed. These cavities are generally lined with a more or less thick secreting membrane. In a few instances, osseous deposit has been found in the membrane of the cyst. In other respects the alterations are the same as are observed in the various forms of pulmonary consumption.

49. Alterations of the large vessels in the chest, and of the heart itself, are occasionally found, especially in the cases of aged persons. The pulmonary veins have been seen diseased, inflamed, or obstructed by fibrinous deposits, or by tumours, or other morbid depositions, either externally or internally. I have found them inflamed, and the large branches partially obstructed by lymph. A dilated or varicose state of the pulmonary veins has been noticed in connection with hæmoptysis, by MORGAGNI, GILLIBERT, PORTAL, and J. FRANK. Lesions of the pulmonary artery have also been met with, especially *rupture* (MATANI, *De Aneurism. Præcordior. Morbis*, p. 120.) and aneurismal dilatation (J. FRANK, &c.). Dr. SEMPLE has detailed a case, which was attended with vomiting, owing to the circumstances above pointed out, wherein the left pulmonary artery was obliterated, and the lung was extensively diseased. Aneurisms of some part of the aorta opening into the trachea, bronchi, or lungs, have been oftener observed than these. CRUIKSHANKS found the lymphatics of the lungs turgid with blood, absorbed from the air-cells, in patients who had died of hæmoptysis.

50. Diseases of the heart, particularly such as occasion obstructed circulation through the left cavities, as narrowing or dilatation of the auriculo-ventricular opening, insufficiency or other lesions of the valves, &c., are not infrequently found in connection

with hæmoptysis. Hypertrophy of the ventricles, especially of the right ventricle, has been remarked, in rare instances. BERTIN, BOUILLAUD, and other French writers, attach considerable importance to this lesion as a cause of the hæmorrhage; but I agree with Dr. WATSON in considering the alterations which obstruct the passage of blood from the lungs as much more frequent causes of hæmoptysis than this.

51. (d.) The *Several Causes of Hæmoptysis* should be kept in view, especially when it is considered that the expectoration of blood is often a very early indication of tubercular formations in the lungs; and on this account, more especially, all the circumstances under which its slighter grades, as well as its more alarming discharges, should be reviewed, irrespectively of its connection with tubercular formations. It becomes necessary, therefore, to take a brief view of the various occasions on which hæmoptysis occurs, with reference, 1st, to those which are most commonly *predisposing*, and 2nd, to those which are usually *exciting* or more immediate, though they will be more fully discussed hereafter.

52. a. The *predisposing occasions* of Hæmoptysis are most frequently those which are especially concerned in the production of pulmonary consumption; but there are others which may occasion the discharge of blood from the chest independently of tubercular formations. This discharge is more or less favoured by hereditary constitution and disposition, generally connected with the scrofulous and hæmorrhagic diathesis; by the sanguineous, irritable, and sanguineo-irritable temperaments; a plethoric habit of body; the period of life between seventeen and thirty-five; tallness of stature; a narrow or deformed chest; curvatures of the spine, rickets, or severe whooping-cough in early life; sedentary occupations, especially at the writing-desk or drawing table; a change of modes of life, as from active employments to inactivity; certain trades, as shoe-making and weaving; the spring and summer seasons; sudden or frequent vicissitudes of temperature and weather, especially rapid changes from cold to heat; suppression of accustomed excretions and discharges; and congestions or enlargements of the liver or spleen. M. LOUIS found hæmoptysis to occur among men nearly in the same proportion at all ages. GALEN, STRAMPIN, GOLTZ, and LOUIS consider it to be more frequent in females than males. FRANK and CONRING entertain a different opinion; the latter remarks that men are more prone to the disease than females, unless when the catamenia of the latter are suppressed. LOUIS found it more frequent in females in the proportion of three to two, and

that their age was most commonly from 40 to 65. I believe that the predisposition to hæmoptysis is less, or at least not greater, in females than in males, until the period at which menstruation usually ceases; but that after this period, the frequent occurrence of vascular plethora favours the production of pulmonary hæmorrhage. There is no doubt of the influence of premature and excessive venereal indulgences, and more especially of solitary vices of this kind, in favouring the occurrence of this and its allied diseases.

53. *b.* The *Exciting Causes* are chiefly external injury; fracture of the bones of the thorax; wounds of the chest and lungs; falls or concussions on the chest; physical efforts, particularly in lifting or carrying great weights; compression of the thorax by strait-lacing, &c.; running, especially against the wind, and hunting; railway travelling with the face to the engine; protracted exercise with the arms, great exertions of the voice, reading aloud, or speaking for a long time; playing on wind instruments; inhaling irritating fumes, as those of acids, &c., or particles of dust, as in various occupations; foreign bodies fallen or drawn into the trachea and bronchi; cold in any form or mode of application; rarefaction, or great dryness of the atmosphere; the suppression of other sanguineous discharges; anger, and the more violent mental emotions; venereal excesses; terror, frightful dreams, or sudden surprise; severe fits of cough, of laughter, or of sneezing; straining at stool; and changes in the state of the blood. Besides these, many of the lesions just mentioned (§ 47, *et seq.*) act as exciting causes, especially tubercles and their consequences; alterations of the vessels either in the seat of hæmorrhage, or near the centre of circulation; and difficult or impeded passage of blood through the heart, pulmonary vein, or aorta, &c.

54. *c.* The *Seat of hæmorrhage*, in cases of hæmoptysis, has not always been recognised with precision. Previous to the writings of BICHAT, the effusion was very generally supposed to proceed from a ruptured or ulcerated vessel, arterial or venous. Subsequently it has been generally referred to exudation from the capillaries of the bronchial membrane. I believe that at present it is too exclusively imputed to this source; and that, although this is much the most common mode of its production, it not infrequently proceeds from diseased or ulcerated vessels, particularly when the discharge is sudden, very copious, or rapidly fatal.—It has been supposed by some, that the blood is exuded from the general surface of an ulcerated cavity, when this lesion has preceded the discharge. This may possibly be the case in a very few instances;

but, when the cavity is the seat of the hæmorrhage, one vessel, or a few only, are most likely its source. In most of the cases of hæmoptysis, in connection with cavities in the lungs, or fistulous ulcers, that I have seen, the internal surfaces of these cavities appeared not in a state indicating that hæmorrhage either had, or could have, taken place from them. The circumstance of the small bronchi being filled with blood, or their membrane being deeply tinged, or even injected or inflamed, is no proof of the discharge having taken place from them, as the blood when once effused, even as high up as the trachea, will frequently gravitate or pass downwards into the minute air-vessels, especially when the lungs are in a state of disease or of debility, and will discolour, irritate or even inflame them.

55. J. P. FRANK has endeavoured to establish a variety of hæmoptysis under the denomination of tracheal, from its seat. Admitting the occasional occurrence of hæmorrhage from this situation, it rarely can be distinguished from other states of the disease, even with the aid of percussion and of auscultation; for, as this very able and practical writer has shown with great truth and originality, a considerable portion of the blood effused in this situation passes down into the bronchi, and gives rise to the same phenomena as depend upon the more common forms of the malady. This, however, he concedes. In cases, also, of profuse hæmorrhage from the pharynx or parts adjoining, a portion of the blood may escape into the trachea, descend into the bronchi, and afterwards be coughed up, thereby simulating hæmoptysis. The blood may thus pass into the lungs as well as into the stomach, and may either be coughed up, or both coughed and vomited up, thereby simulating true hæmoptysis; or, if the quantity be great, it may suffocate the patient. Dr. WATSON mentions a case which he saw, in which suffocation occurred from the passage of blood into the respiratory passages, from an ulcerated opening into one of the lingual arteries, the bronchi containing a considerable quantity of this fluid. From the foregoing, therefore, it may be inferred, that the blood in true hæmoptysis proceeds from one or other of the following sources:—1st. From the mucous membrane of the bronchi — *Bronchial Hæmorrhage* — 2nd. From the substance of the lung, constituting the pulmonary apoplexy of LAENNEC, or, more correctly, *Pulmonary Hæmorrhage*. — 3rd. From an ulcerated or tuberculous cavity, one or more vessels having been eroded or ruptured. — 4th. From aneurism of the aorta, or of some other artery.

56. *d. Certain Pathological Relations of Hæmoptysis* have been very generally overlooked by writers on this and other pulmonary diseases.— *a.* The intimate connection, however, existing between it and *tubercles in the lungs* has been very diligently investigated by LOUIS, ANDRAL, and others. ANDRAL refers to cases of hæmoptysis in which there appeared to be no evidence of the previous existence of tubercles in the lungs. Such cases are rare, and are to be referred chiefly to extreme congestion of the lungs. Instances are certainly not infrequent, of the hæmorrhage occurring in a state of apparent health; but, in many of these, tubercles in an early stage of their existence may have previously been formed, or even have been detected upon close examination. My own observation is more in accordance with that of LOUIS, who states that, with the exception of some cases in which hæmoptysis depends upon external injury, or is connected with suddenly suppressed catamenia, it indicates with very great probability the presence of tubercles in the lungs. Sir JAMES CLARK, in his able work, observes that hæmoptysis is occasionally idiopathic, or dependent upon a temporary plethora or congestion of the lungs, especially when it is a consequence of suppressed sanguineous discharges. In tubercular phthisis, congestion of portions of the lungs, or even of the whole of the organ, is not infrequent, and is, in many cases, followed by a more or less copious hæmoptysis. Such congestion may also develope tubercles, or hasten their progress, as well as occasion the effusion of blood. In some instances the discharge will afford relief to all the pulmonary symptoms, especially when the effused blood is entirely thrown off; but, in others, it will accelerate a fatal issue, particularly when a portion of it remains in the bronchi, and irritates them, as shown hereafter (§ 58.).

57. It has been supposed by ANDRAL and others, that hæmoptysis occasionally is a cause of phthisis, the blood effused into the lungs forming a matrix for tubercular deposits. But to produce this effect the effusion must take place in a scrofulous constitution. I agree, however, with Sir JAMES CLARK in considering hæmoptysis rarely to be a cause of phthisis, unless by the debility it induces when very copious, or by the depletion employed to suppress it; or still more probably by the irritation produced by the effused blood in the minute bronchi. It is a frequent symptom during the whole course of phthisis, and may appear at any stage. LOUIS states that it was present in some degree or other in two-thirds of his cases. It is rare in the phthisis of children and old persons, and occurs in them chiefly towards the close of the disease.

58. *b.* The connection between hæmoptysis and *inflammation of the lungs* has been very generally overlooked. The former occurs in very rare cases as a termination or crisis of the latter; but when the inflammation is associated with tubercles, the development of these is frequently promoted by the hæmoptysis. One of the most common consequences of hæmorrhage into the bronchi is inflammatory action. The effused blood irritates the mucous membrane of the bronchi, especially in the minuter ramifications, and the morbid action often extends to the air-cells and substance of the lungs. This is very frequently observed in weak and susceptible constitutions, and when the effused blood has been imperfectly excreted from the bronchi. The softening and discoloration of the bronchial surface, generally seen in fatal cases of hæmoptysis, arise from this consecutive inflammatory irritation; and the puriform matter sometimes poured into the bronchi, with or without fibrinous concretions, or a coloured lymph, proceeds from the same source. A part, doubtless, of the fibrinous matters arises from the effused fluid; but a part also consists of the lymph given out by the capillaries, which had shortly before discharged blood. In all cases, therefore, of hæmoptysis, it is not merely the development or accelerated progress of tubercles which is to be dreaded, but also the supervention of circumscribed or diffused *pneumonia*, which may assume either sthenic or asthenic forms.

59. *c.* The relation of hæmoptysis with *disease of the heart* has been already alluded to. The momentum caused by hypertrophy of the right ventricle is rarely sufficient to rupture any branch of the pulmonary artery, although it may probably overcome the resistance opposed by the tonicity of the extreme capillaries in the bronchial surface, or in the substance of the lungs. Dr. WATSON, who has taken a very sound view of this, as well as of some other subjects connected with hæmoptysis, states that every instance of pulmonary hæmorrhage dependent upon organic disease of the heart which he had observed, coincided with disease on the left side of that organ, mechanically obstructing the return of blood from the lungs. The obstacle has sometimes been placed at the entrance of the aorta, but it has most commonly consisted of narrowing of the left auriculo-ventricular orifice, and a rigid condition of the mitral valve. Facts illustrative of this relation have also been adduced by Dr. WILSON (*Med. Gazette*, vol. vi. p. 25.), and observed by myself. I believe, moreover, that those powerful mental emotions, which affect suddenly the functions of the heart — which seriously disturb its action, and favour congestion of its

cavities, as terror, fear, anger, grief, &c. sometimes produce hæmoptysis by impeding the return of blood to both the right and the left sides of this organ.

60. *d. Other complications* beside the above occasionally present themselves in practice; but, in these, hæmoptysis is merely a symptom, arising from some predisposition to pulmonary or hæmorrhagic affections. — *a.* It has been stated that bronchitis and pneumonia often follow hæmoptysis, and the reason has been assigned (§ 58.). But the *complication* of acute or sub-acute *pneumonia* with slighter forms of this disease, has been very generally overlooked, especially by recent writers. STOLL and BROUSSAIS, however, have remarked that hæmoptysis sometimes accompanies, or is an accidental symptom of, pneumonia. The remark is just. Care, therefore, should be taken to recognise this state, as well as to distinguish between both diseases; as the use of astringents, on the supposition that the patient is suffering the former affection only, might lead to fatal results. Even with the aid of auscultation, the existence of the pneumonia may not be ascertained, as the auscultatory signs may be ascribed to the infiltration of the bronchi, or of the substance of the lungs, with the effused blood, or to the attendant congestion. The rational symptoms in this case should be carefully weighed: and where there are dyspnœa, cough, oppressed or quick breathing, heat of skin, a hard or full pulse, deep-seated pain in the chest, crepitant rhonchus and bronchial respiration, present, the disease should be viewed as inflammatory, the hæmorrhage being merely a contingent symptom or complication. Even when the hæmoptysis has originated in tubercles, inflammation of one or more lobes of the lungs may also exist, and may implicate not only the substance of the organ, but also its pleura, giving rise to albuminous exudation, and adhesions to the costal pleura. I have not infrequently found, upon dissection of cases of hæmoptysis, not only tubercles in every stage of their progress and results, but also inflammations of the substance of the lungs, and of the pleura, with all the structural consequences, and yet, in some cases, no pain had been felt so severe as would have directed attention to an affection of the pleura. The following from among several similar cases will illustrate these remarks: A youth aged about sixteen, of a scrofulous diathesis, who had been long under my care with tubercular phthisis, died with profuse hæmorrhage from the lungs. Excavations in this organ, with accretion of the pleura, had been recognised some months before his death. He had not complained of pain in any part of

the thorax. The body was examined in my presence by Dr. HERBERT BARKER, the learned and eminent physician of Bedford, twelve hours after death. Numerous cavities with thick linings were found dispersed through both lungs; the small intervening spaces being studded by crude tubercles. Each lung contained between thirty and forty ulcerated cavities, varying from the size of a bean to that of a large orange; those on the right side being the largest, and from this side the hæmorrhage had taken place. The cavities on the left side were filled by pus of various colour and consistence. Those on the right were filled chiefly by coagulated and fluid blood, the latter mixed with pus in some places. The right pulmonary pleura was so firmly adherent to the costal and diaphragmatic pleuræ, that this lung could not be removed from the chest until all the costal pleura was removed from the parietes to which it was attached. In this case the heart participated, in its unusual atrophy, in the extreme emaciation of the body. The stomach, as in many cases of profuse or fatal hæmorrhage from the lungs, contained a large quantity of blood, thus illustrating the above statements.

61. *e.* It is not unusual to see hæmoptysis in the course of severe *hooping-cough*, especially when this latter disease affects persons near, or after, the period of puberty. In children the hæmoptysis is generally slight; but in grown-up persons it is often a dangerous or fatal complication of *hooping-cough*.

62. *f.* It is occasionally observed as a consequence of *enlargement* or *congestion* of the *liver* and *spleen*; these affections in some measure causing the pulmonary hæmorrhage, by deranging the circulation through the lungs or heart, or both. In most of such cases the functions of the heart are intermediately disturbed. Where the hæmoptysis is consequent upon hæmorrhoids, obstructions of the liver may be anticipated. This connection has been noticed by BAILLOU, MORGAGNI, STOLL, LANDRÉ BEAUVAIS, and others. SAUVAGES makes very particular mention of the occasional dependence of hæmoptysis upon enlargements of the spleen.

63. *g.* The connection between hæmoptysis and *hæmorrhoidal affections* is generally one of sequence rather than of association; the former following the latter, or sometimes occurring after operations for these, and for *fistula in ano*. The connection with *amenorrhœa* is generally that of cause and effect; but the pulmonary disease and the attendant hæmorrhage more frequently give rise to the suppression of the catamenia than this latter occasions the hæmoptysis. The connections, however, of hæmoptysis with these

maladies, are most commonly observed early in, or in the course of, pulmonary consumption.

64. *Hæmoptysis* is often the first symptom which excites the alarm of the patient in phthisis, and the attention of his friends. The older writers often considered hæmoptysis a cause of phthisis, whereas modern research has shown that it is generally a sign of this disease, tubercular deposits being its most frequent cause. The following table, from the Report of the Hospital for Consumption, shows *the existence or non-existence of Hæmoptysis in 1,381 cases of Phthisis, arranged according to the sexes, without reference to age.*— Males, 910; Females, 471; total, 1,381.

	Males.	Per Cent.	Fem.	Per Cent.	Total.	Per Cent.
Hæmoptysis - -	563	61·9	307	65·2	870	63
No Hæmoptysis - -	347	38·1	164	34·8	511	37

65. The reporters remark that a large proportion of the above cases was seen at an early period of the disease, and that not a few of them were only a short time under observation. Hence many of those in whom this symptom had not occurred when the cases were noted, would in all probability be sufferers from it during the further progress of the malady. It may, therefore, be assumed that the proportion of cases in which hæmoptysis occurs is still greater than that shown in the table. It would result from the above that nearly an equal proportion of *males* and of *female* are found to present this symptom. The following table *shows the existence or non-existence of hæmoptysis in 1,084 cases of phthisis; viz., males 706—females, 378; arranged according to the sexes in decennial periods. Also the percentage of the cases in which hæmoptysis occurred:*—

Age.	Hæmoptysis Occurred.		Hæmoptysis did not occur.		Total of Cases Observed.		Hæmoptysis occurred per Cent.	
	M.	F.	M.	F.	M.	F.	M.	F.
0 to 5	0	3	2	4	2	7	- -	42·9
5 to 15	7	32	14	9	21	41	33·3	78·0
15 to 25	124	107	85	45	209	152	59·3	70·4
25 to 35	175	59	71	42	246	101	71·1	58·4
35 to 45	115	35	48	25	163	60	70·6	58·3
45 to 55	29	7	23	8	52	15	55·8	46·7
55 to 65	3	0	10	2	13	2	23·1	
65 to 75	0	0	0	0	0	0	- -	
Totals .	453	243	253	135	706	378	64·2	64·3

Dividing the age of 70 into two equal periods — into two 35 years — the percentage of cases of phthisis in *males* was 64 in both periods, whilst in *females* it was 67 for the first 35 years of age, and 54·6 for the second 35 years. In females, also, from five to 25 years of age, hæmoptysis occurred in the ratio of 72 per cent; whilst between the ages of 35 and 55, it appeared only in the ratio of 55 per cent. The reporters further state that the *stage* of the disease in which hæmoptysis occurred was noticed in 696 cases, of whom 453 were *males*, and 243 *females*, as in the following table:—

	Males.	Per. Cent.	Females.	Per Cent.
Before softening . . .	333	73·5	176	72·4
After softening . . .	120	26·5	67	27·6

This table shows that hæmoptysis is much more frequent (nearly as 3 to 1) in the first period of phthisis than in the second and third conjoined, and nearly equally so in both sexes. It is very difficult to account for this greatly increased frequency of hæmoptysis in the first stage of the disease; but it is probable that it appears greater in this stage than it actually is in practice, the whole progress of the disease having been observed: inasmuch as the reporters admit that many of the cases were only a short time under observation, and were not seen in the far advanced progress of the malady. There can be no doubt, however, that the occurrence of hæmoptysis in so large a proportion of cases in the first stage establishes it as an important diagnostic symptom of phthisis.

66. *Hæmoptysis*, though generally a symptom, and very rarely a cause, may determine the development of tubercles in the lungs of a scrofulous person, or the debility induced by a very abundant hæmoptysis may have a similar effect; and, as M. ANDRAL has shown, the infiltration of a portion of the effused blood into the air-cells and pulmonary structure may form a nidus for the primary deposit of tubercles. Notwithstanding these exceptions, as far as they may be considered as such, hæmoptysis may be viewed as generally produced by tubercles, although it may be conceded that, in some cases, especially when slight or moderate, it may be the result, in common with the tubercular deposit, of the sanguineous congestion of the lungs, often preceding and attending the early stage of phthisis, especially in the scrofulous and sanguineous diatheses. It should not be overlooked that the hæmoptysis may be produced by the pulmonary congestion consequent

upon impaired vital action, or upon structural lesion of the heart, and by the severity of the cough, either independently of or in connection with these conditions of the heart, the blood effused into the pulmonary tissue and air-cells proving the matrix of tubercles, as ANDRAL contends. When hæmoptysis proceeds from these morbid states it is usually copious, and is often less dangerous than the slighter states of it, more obviously dependent upon the early stages of phthisis. BAILLOU, two hundred years ago, said that large discharges of blood from the lungs are less dangerous than small; and, although this is very frequently but not absolutely the case, it by no means deserves the importance attached to it by PORTAL. M. LOUIS remarks, respecting this symptom in this and other diseases, that, with the exception of some cases in which it depends upon external injury, or is connected with suppressed catamenia, it indicates, with a high degree of probability, the presence of tubercles in the lungs; and SIR JAMES CLARK states that his experience supports this conclusion.

67. According to M. LOUIS, hæmoptysis occurs more frequently in females than in males, in the proportion of three to two,—a proportion much higher than stated by other observers; and he considers it most frequent in females from forty to sixty-five, that is after the period of the cessation of the catamenia; but in this also he is not supported by other observers in different fields of observation. The frequency of the attacks, he remarks, is generally in proportion to the duration of the disease; the more copious discharges rarely occurring oftener than twice or thrice in the same persons. “In all his cases it was present, in a greater or less degree, in two-thirds; and the numbers in which it was copious and inconsiderable were nearly equal.” In some it was a frequent symptom during the whole course of the disease, in others it never appeared. In persons advanced in life and in young children it rarely occurred, and then chiefly towards the close of the disease. In rare cases it was the first symptom, even before the cough, occurring suddenly, and, as M. LOUIS asserts, in the midst of perfect health, and without any appreciable cause. This latter assertion does not agree with my experience, nor with that of Sir J. CLARK, who very justly remarks that he has generally found the aspect of the patient to have been by no means indicative of perfect health, although he may not have complained: and that he has more frequently known the hæmorrhage to succeed bodily exertion, such as running, ascending heights, or long speaking, than when no such evident cause had occurred. In these cases,

the hæmoptysis often does not appear until a few hours after the exertion. I entirely concur in the opinion here expressed in opposition to M. LOUIS.

68. The quantity of blood expectorated varies remarkably from a teaspoonful or tablespoonful to one or even two pints or even much more; most frequently, it is only about two or three mouthfuls. In some, the blood merely appears in clots or streaks in the sputum, in others it is distinct and in some quantity; when the latter, it is generally pure, sometimes frothy or florid; at others dark or slightly clotted. Very large quantities are brought up with varying remissions; but at an advanced stage of phthisis the hæmorrhage is usually continuous, until several pints are discharged, and the patient is sunk by it or suffocated. This copious hæmoptysis is generally owing to the erosion of a considerable vessel by the tubercular ulceration. It is not very often that great hæmorrhage occurs at an early period; and yet I have known cases in which upwards of 100 ounces were lost at the commencement of the disease. Hæmoptysis, therefore, taking place either before or after cough or shortness of breathing, should be viewed as indicating tubercles of the lungs, although it may arise from disease of the heart, associated with the same symptoms only in very rare instances.

69. *D. COUGH* is generally the earliest symptom of phthisis, but it is often so slight as not to excite the attention of the patient or his relatives; and for some considerable time it may occur only or chiefly in the morning. In such cases, and at this early period, the character of the cough, the state of breathing, and the appearance of the features, particularly of the eyes, ought to be examined, and the representation, often adduced, that it is merely a stomach-cough, or from laryngeal irritation, should not receive any attention; for it may be either or both of these, and not the less depend upon, or be connected with, tubercular deposits in the lungs. The continuance of the cough for weeks, or even months, without any expectoration, is of itself sufficient to cause strong suspicions of its origin. The association of the cough with shortness of breathing, any exertion causing cough or increasing the quickness of respiration, is an additional proof of the nature of the disorder. The cough is after a time observed in the course of the day or upon suddenly changing the apartment or the temperature, or upon reading, exerting the voice, &c., and it is afterwards followed by the expectoration of a transparent frothy fluid, which is often represented as coming from the pharynx and fauces. The

cough generally increases with the progress of the pulmonary lesions, but such is not always the case; for, as will be stated hereafter, it may be very slight, or almost absent throughout the disease, or appear only a few days before death. Such instances have been remarked by PORTAL, LOUIS, ANDRAL, CLARK, and myself. In the course of the chronic and more protracted cases of phthisis, even when tubercular excavations undoubtedly exist, it is not unfrequently observed that, in favourable circumstances, cough and expectoration disappear for weeks, but return upon exposure, or from errors of regimen. In the advanced progress of the malady, cough is generally severe, occurs at all times, often without any evident cause, but especially at night and in the morning, disturbing sleep, occasioning pain in the chest, or even in sometimes causing vomiting. In the last stage it is often followed by breathlessness amounting to a sense of suffocation in some cases, or to sinking in others. The cough at the commencement of phthisis is entirely owing to sympathetic irritation of the larynx, and not to a fluid which requires to be expectorated. As the malady proceeds, it is chiefly caused by the discharge of the morbid secretions from the bronchi, or from both the bronchi and the cavities.

70. *a.* Tubercular or *phthisical cough* may, however, be confounded with the *cough of catarrh*, or of *influenza*, or of *gastric*, *hepatic*, or *nervous disorders*. Of the *first*, it may be said, that the attack is readily referred to its cause, is well marked and preceded by the usual symptoms of catarrh, either slight or acute. It is often attended by hoarseness, by soreness of the chest or trunk; and although at first dry and hoarse, it is soon followed and accompanied with expectoration, which is at first colourless, frothy, but afterwards opaque or mucuous, yellowish, or muco-puriform; both cough and expectoration generally diminishing with this change of the sputum, and shortly ceasing altogether. When, however, the catarrh assumes a chronic form, or becomes exasperated, and passes into bronchitis, the difficulty of diagnosis may be much greater. *Bronchitis*, acute or chronic, will readily be distinguished by the symptoms and signs described in the *Second Part* of this work; and *chronic catarrh* will be readily recognised as such, although, in consequence of the state of the lungs before the catarrhal attack, it may pass into phthisis; the shortness of breathing, the increased severity of the cough in the morning, the chills in the early part of the day, the age of the patient, the appearance of the eyes, and the occurrence of hæmoptysis, evincing the transition into, or the pre-existence of, tubercular disease.

71. *b.* The cough of *Influenza* cannot be readily confounded with the cough of phthisis, if the character of the constitutional symptoms of the former, especially the pains in the head, back, and limbs, the general malaise, and the prevailing epidemic be taken into account. Influenza, as well as measles, whooping-cough, and other epidemic diseases, when attacking persons whose lungs are prone to tubercular deposits, may determine or excite the phthisical malady, or may develope it into a very manifest, acute, and rapid form, if it had previously existed in a latent form, or in its first or least apparent stage.

72. *c.* *Gastric Cough* is readily mistaken for the early stage of phthisis, but it is louder and harder than the latter, is more paroxysmal, and often manifestly excited by some of the more prominent symptoms of indigestion, as by flatulency, acidity in the stomach, acid or acrid eructations, by a loaded tongue which is red at the point and edges, and by various other dyspeptic phenomena, especially by disorders of the bowels and liver, and by a loaded or high coloured state of the urine. Gastric irritation may, however, be associated with the first stage of phthisis; and, when this obtains, the diagnosis will be more difficult; but the former disorder will generally declare itself, and claim the chief attention, as the readiest and surest indication for aiding the latter affection. A *stomach-cough*, often of much severity in the morning, when a grey tenacious mucus is expectorated—the cough being severe in consequence of the difficulty of bringing up the tenacious phlegm—is not so readily mistaken for a phthisical cough, as it is generally observed in connection with manifest signs of indigestion, and in persons of mature age, or advanced in life, and of a gouty or rheumatic diathesis, or in those addicted to full living, or to the enjoyments of the table.

73. *d.* *Hepatic Cough*, owing to its dryness, or to the slight mucous expectoration attending it, may be mistaken for the first stage of phthisis. But due attention directed to the state of the hepatic functions and to the region of the liver; the pale, sallow, and sunken appearance of the countenance; the disorders referrible to the stomach and bowels, and various other sympathetic phenomena contingent upon biliary and hepatic affections, will sufficiently indicate the source of the cough, when due attention is directed to it.

74. *e.* *Nervous* and other *Sympathetic forms of cough* are occasionally observed, especially in delicate persons; and, chiefly as occurring in these, both excite suspicions of phthisis, and require investigation. A *nervous cough* is apt to occur in females both

after and before puberty, and especially as a sequela of whooping-cough, or of measles, and often excites alarm, not merely as it simulates, but as it may actually complicate, the first stage of phthisis. This cough is generally paroxysmal, is severe, and in protracted attacks, being sharp, barking, or tracheal, and without, or with merely a slight watery, expectoration. In females it frequently presents a hysterical character, with indications of nervous irritability and of uterine disorder, as catamenial disturbance, leucorrhœa, pains in the loins and the lowest part of the spine or sacrum; it is often occasioned by masturbation, and not unfrequently disguises, as well as complicates, the first stage of consumption. *Intestinal worms* may occasion a cough, especially in children and young persons, which, owing to the pallor, flaccidity of the tissues, and emaciation, as well as to the short, dry, and hacking form of the cough, may be mistaken for incipient phthisis. Attention to the abdominal functions, to the state of evacuations, and inquiries as to the symptoms of verminous disorder, will generally indicate the nature of this cough.

75. *f.* Although the *diagnosis* of phthisical cough from other forms of cough is important, yet the mere determination of this point ought not to lead us to overlook the fact that they may severally complicate phthisis, especially in its first stage, may mask this stage, and may, moreover, either excite and determine its existence, or develope it into active and manifest forms, when it had previously existed in a slow or latent state. Whether, however, these forms of cough occur independently, or as a complication of phthisis, their removal by judicious treatment is requisite, inasmuch as they are injurious to the constitution, even when existing independently, and are sources of aggravation to the pulmonary disease, when they are complicated with it.

76. *E.* EXPECTORATION is not usual until the cough and acceleration of breathing, with quickness of pulse, has continued for some time. It is at first scanty, transparent, ropy or tenacious, greyish or frothy; often resembling saliva. After an indefinite period, specks of an opaque matter are seen in the transparent frothy fluid. "These specks differ in appearance, being at one time white, at another yellow, or even approaching to green, and again very frequently of an ash colour; partly sinking in water in little masses." The greyish and ropy portion of the sputum partly float in it, in the form of striæ, suspending the minute tubercular masses. Before or about the time of the change of the sputum to this state, streaks, or specks, or even small clots of blood are

occasionally seen in the expectoration. As the malady proceeds, the sputum becomes more opaque, of a yellowish hue, and is coughed up with more ease, and in more distinct masses. At a later period, the sputum is of an ash colour, and is brought up in distinct, rounded, flocculent-like masses, enveloped in the transparent ropy portion. If the patient be directed to expectorate in a glass vessel two-thirds full of water, some of these masses will be seen to sink to the bottom; others, which are frothy, will float on the surface, and parts of these will be suspended at different depths, often retaining the minute, cheese-like, or flocculent, tubercular specks or masses, or allowing these to sink to the bottom, yet connected with the surface by the more fluid and ropy portion of the expectoration. This change of the sputum into ash-coloured, distinct masses, with more or less of a thin mucous fluid, occasionally occurs only a few days before death, but more generally it has continued for many weeks or even months before this event. In some instances it retains the yellowish, puriform appearance, and forms smooth, flat patches; and in rarer cases it is semi-transparent, tenacious, and gelatinous, and, as in bronchitis, is separated with great difficulty from any vessel containing it. "During the last days of life the expectoration is in a more dissolved state, and sometimes of a darker hue; about this period, also, and often long before, it has a very foetid odour; finally it diminishes gradually, and often disappears entirely some days previous to death."

77. Such are the usual appearances of the expectoration; but the periods at which it commences, and at which the changes take place in it, differ in different cases. Its characters also vary, or differ much, as certain complications or intercurrent affections occur in the course of the malady, as catarrhal or bronchial attacks, inflammation of the lungs or pleura, &c. The transparent, tenacious, and frothy sputum, although generally accompanying tubercular deposits, is only a secretion from the bronchi, and may take place independently of these deposits. The yellowish-green sputum, often also observed, is frequently discharged in chronic catarrh, and towards the termination of bronchitis. These, although often abundant in, and forming the chief part of, the expectoration in tubercular phthisis, proceed from the bronchial membrane. The two characters, however, which may be considered peculiar to that attending phthisis, are the striated mass, with a mixture of whitish fragments in it, and the ash-coloured, globular masses, which are observed in the more advanced stage of the disease. I agree with

Sir JAMES CLARK in considering these as very rarely unaccompanied with tubercular disease.

78. The quantity of the expectoration varies remarkably in different cases, and is by no means commensurate with the extent of pulmonary lesions. It may be very small, or almost altogether absent, although large excavations are found after death; the disease having advanced rapidly to this issue. Even in an early stage, and while it is still transparent, the quantity is often very great; the disease also in these cases assuming a febrile or rapid form. PORTAL, ANDRAL, CLARK, and the Author, have met with rare cases in which the expectoration has been entirely wanting, and the cough very slight, up to the very close of life, and yet small tuberculous vomicae and most extensive tuberculous deposits, in some cases, and large excavations in others, were found after death. The cases of this description, which occurred in my practice, had been mistaken before I saw them for low nervous or typhoid fevers, although the rapid pulse, the still more rapid breathing relatively to the quickness of the pulse, the appearance of the features, the night-sweats, the emaciation, and the appearances of the fingers and nails, might have shown the nature of the malady, independently of the physical signs. As to the sources of the expectorated matter, it must be evident that, before softening of the tubercles has occurred, and before they have communicated with the bronchi, the bronchial membrane has supplied it, in consequence of the irritation extended to this membrane from the morbid deposit, and of the congested state of the pulmonary vessels, of which the tubercular deposits and the expectoration are the common and combined results. The softened tubercles and the surfaces of the cavities consecutively formed also supply a part, often very small, of the sputa, more especially that part which is the most characteristic of the malady.

In cases where the expectoration is either scanty or nearly wanting, the severity of the constitutional symptoms, the rapidity of their progress, and the indications of a contaminated state of the circulating fluids, render it extremely probable that the morbid secretion from the surface of the cavities as well as the liquefied tubercular matter, are absorbed, or imbibed by endosmosis, and carried into the blood, which it thus poisons, thereby heightening and accelerating the symptoms. From the above it may be inferred, that the state of the expectoration should always be viewed in connection with the other phenomena of the malady; that it affords little evidence of tubercles in their early or crude stage, but when

the change takes place in the sputum, and the debris of tubercles are present in it, then a very satisfactory proof is thereby furnished of the existence of the disease in an advanced stage. Besides the appearances of the sputa already considered there are two others, which deserve a special notice, viz.: *hæmoptysis*, from its frequency and importance (§§ 49, *et seq.*); and *calcareous concretions*, from the various considerations suggested by them.

79. *The expectoration of calcareous concretions* from the lungs, occurs either months or years after the appearance of pulmonary symptoms — generally after years have elapsed, — the patient either having recovered, or partially recovered, and having experienced a relapse. The size of these concretions varies from that of a hemp-seed to that of a pea or small bean. This last size is the largest I have seen, and was expectorated by a lady in the last stage of the malady, which had been of many years' duration. A medical friend was sent up the Mediterranean in 1818 for change of climate in the first stage of phthisis. He recovered, but expectorated these concretions on several occasions long afterwards. He is now alive and in good health. Another medical friend lately called upon me and stated himself to have been then, and long previously, in good health, with the exception of a loud whistling noise, during both inspiration and expiration, which could be heard in any part of the apartment in which he was. He told me that he was considered to have been consumptive many years before that time. I said that he would soon expectorate one of these concretions, and he did so in a few days. It was of the shape and size of a split pea. He is in good health. But these concretions are not met with in these circumstances alone, but also in others much more serious or altogether hopeless, as in the last stage of the more chronic and protracted cases. They are then especially brought up with a copious expectoration, sometimes without any blood, at others with streaks of blood, but rarely with a more copious hæmoptysis. In a case now under my care the patient, in the third stage of phthisis, has expectorated a number of these concretions. She has been consumptive for many years; and for several years before the disease had reached this stage had occasionally brought up, with little apparent ailment, one or more of these concretions. When they appear in a state of apparent health, they are unattended by much or even any sputa beyond a little mucus, or mucus streaked with a little blood or bloody specks. The pathological conditions in which they are usually found will be noticed hereafter.

80. *F. PAIN*, especially acute pain, rarely attends the early stage of phthisis; but a slight or aching pain is often felt, although not often mentioned by the patient, in the shoulders, or near the clavicles or upper regions of the chest. In the second and third stages, pain, often of a severer character, is frequently experienced, and is generally referred to either side, or to the situation where the tubercular lesions are most advanced or extensive, and where the pleura has become implicated. When adhesions are formed between the opposite surfaces of the pleura, pains often severe are felt, not only in one or both sides, but also in the back or under the shoulder-blades. They are different from those of catarrh, bronchitis, and influenza, which are experienced chiefly under the sternum when coughing, and are characterised by a sense of soreness rather than by acuteness or sharpness. In some cases pain has been felt under the short ribs, and, owing to the lowness of the situation, has not always been referred to its true source. But it will generally be found to proceed from adhesions of the pulmonary, to the diaphragmatic or costal pleura. When the bowels are disordered it may be caused by the state of the colon, but in this case the pain is not persistent and often shifts its situation.

81. *H. The pulse* often furnishes important indications of phthisis, even before any of the phenomena already noticed can be detected. In persons about or after puberty, who are of a scrofulous diathesis, a frequent pulse, or a pulse above 80, should be viewed with suspicion, more especially if it be associated with a dilated pupil, a clear or blue, or pearly conjunctiva, and shortness of breathing. In many chronic cases, the pulse may not be accelerated, even throughout the disease, or until its close, and may be considerably under 70 in the minute, especially in the phlegmatic and bilious temperaments. A slow or natural pulse, the breathing being not much accelerated, is observed only in the more protracted cases, and when there are indications of amendment. Great quickness, smallness, or softness of pulse occurs chiefly in the more febrile or rapid cases; and in these the chances of amendment are very few.

82. *I. Hectic fever* approaches generally slowly and insidiously in phthisis, often appears in its slightest form early in the disease, and becomes more marked as the second and third stages are reached. In some cases, however, hectic is wanting, or is so slight as not to excite notice until it breaks out suddenly and severely with all the symptoms of an advanced and acute state of the malady. It

may escape observation or be altogether absent in some chronic cases of the disease, even though cavities have been formed.

83. *K. The digestive functions* are generally more or less impaired at the commencement of phthisis, and even before pulmonary symptoms have appeared; assimilation and nutrition being also imperfect. The bowels are often not materially disordered at an early stage. They are, however, frequently more or less slow or confined, but very readily become free, or even profuse, after recourse to aperients. As the malady advances, especially as the pulse becomes frequent and hectic fever developed, the bowels are irregular in action, are sometimes costive, and afterwards spontaneously and very freely relaxed, or even purged. In more chronic cases, the bowels often continue regular, and the stools are well coloured with bile, for a long time; but when the disease is far advanced, and especially towards its close, *diarrhœa* generally supervenes, and rapidly emaciates and exhausts the patient. In most cases, even early in phthisis, an active purgative, given to remove costiveness, not infrequently acts excessively; and a gentle aperient at an advanced period often produces the same effect, and occasions a diarrhœa which it may not be easy to arrest. It is chiefly in the second and third stages that diarrhœa becomes severe or obstinate. M. LOUIS found it in one eighth of his cases from the beginning until death; in the majority during the latter stages; in some during the last days of life only; and in four out of 112 cases it did not occur. It is often a most distressing symptom, is preceded and accompanied by severe pains, followed by great sinking and exhaustion, and is followed by rapid emaciation. The evacuations are at first yellow and bilious; but they often become watery, curdly, offensive, or emit a sour odour; the diarrhœa depending, as I have shown at another place, upon the state of the follicular glands and mucous surface of the bowels, produced by the morbid condition of the blood, and by the elimination of morbid or effete matters from the circulation, by the intestinal follicles, disease of these follicles and ulceration ultimately taking place. Diarrhœa often diminishes the cough and expectoration, but it seldom prevents, though it often abates, the morning perspirations.

84. *L. Emaciation* is generally present unless the patient is carried off, before it has advanced far, by some complication or intercurrent affection. Frequently more or less wasting may be observed early in phthisis, and in some it is the first symptom which attracts attention, especially when the disease is occasioned by vitally depressing and exhausting causes. In other cases the

malady is advanced far before emaciation is considerable. This symptom is often associated with some degree of pallor and indications of deficiency of red globules, or of a thin or poor state of the blood; and this is the more remarkable, as well as the rapidity of emaciation, as the febrile symptoms and the diarrhœa increase. The state of the blood, even early in the disease, and the arrest of assimilation and nutrition, the consequent waste of the red globules, and the impaired or deficient development of the chyle globules, readily account for the emaciation, and for the state of the circulation, as regards both vascular action and the vascular contents. Emaciation is an early symptom in many obscure cases, especially in persons above thirty or thirty-five years; it is not so generally observed at a very early period in young persons, especially in females, who are still regular or nearly so in their menstrual discharges. When it occurs without any manifest cause, and especially when it is attended by quickness of pulse, by morning chills, or by a sense of cold in the course of the spine, or by a short hacking cough, or by shortness or oppression of breathing, tuberculous disease of the lungs may be inferred; and, if all these symptoms be present, the fuss, parade, manipulation, and charlatanry of a physical examination of the bare chest, so often unnecessarily and even injuriously practised, may in most cases be dispensed with.

85. *M. The fingers and nails* often early, but frequently also not until an advanced period, betray the existence of phthisis. The nails become uncared or bent inwards upon the extremities or tips of the fingers, which are wasted; the last joints appearing enlarged or rounded, and clubbed or terminating in a coniform shape. This appearance is most remarkable when emaciation exists, and, with the symptoms just mentioned, or even alone, is a most unerring sign of tuberculous phthisis.

86. *N. Œdema* of the extremities, especially of the lower, is observed chiefly or only during the last stage of phthisis. It may, however, appear earlier in delicate females, and when the catamenia are suppressed. It is sometimes so remarkable as to amount to anasarca; and, when this occurs, tubercular deposits in the structure of the kidneys, or albuminous changes in the urine, may be suspected. *Swelling* of one limb, very rarely of more, in some cases to such an amount as to resemble the swelling of phlegmasia alba dolens, occasionally supervenes, and is evidently owing to coagulation of blood in thin large venous trunks, with or without inflammation of these as shown by pain and cord-like hardness in their course. This coagulation is generally the consequence of

the passage of tubercular, puriform, or ichorous matters into the circulation, whereby the fibrine partially coagulates in the large veins most remote from the centre of the circulation, the coagulum after a time irritating and inflaming the internal surface of the vessel. The presence, however, of these morbid matters in the blood may also, where they are delayed in their passage, irritate the vessels so as to occasion an exudation from their internal surface sufficient to coagulate the blood as it languidly circulates along them.

87. *O. Morning perspirations* are amongst the most distressing symptoms of phthisis. The disease may be far advanced, and hectic symptoms long present, before the perspirations become copious, or are complained of. When they appear, the second, if not the third stage of the malady may be considered present; and they are then excessive, in relation to the chills and febrile reaction which precede them. This symptom is rarely absent, but it sometimes does not appear until nearly the close of life. LOUIS states that he has found it wanting in one tenth of his cases. When it has been wanting, I have observed the surface of the skin remarkably harsh or rough, abounding in epithelial scales, and foul or sordid. In these cases perspiration breaks out about the face and neck. It usually occurs about the same period of the disease as the diarrhoea, and depends upon the state of the blood occasioning that affection. It has been said to be vicarious of the diarrhoea, one being diminished when the other is increased; but this is not commonly the case, or in a slight degree only. The perspirations take place chiefly in the early hours of morning; if at all present early in the disease, they are only slight, or are confined to the head, neck, and chest; but when abundant, or at a far advanced period, they break out generally over the body, and whenever the patient falls asleep. Occasional intermissions or remissions of them are observed. When they are abundant a rapid termination of the disease may be inferred. The state of the perspiration is diagnostic of the stage, rather than of the existence of phthisis; for when this symptom is manifest there can be no question of its nature.

88. *P. Aphthæ* are common in the last days of phthical existence, during one or two weeks, or more, before death. They are sometimes slight, and in others severe. They may extend over the mouth, fauces, and pharynx, rendering deglutition difficult, painful, or even nearly impossible. When severe, the patient rarely lives many days; and yet, in two cases of chronic or protracted phthisis under my care, the patients rallied, and lived two years in the one

case, and three in the other, after aphthæ were present for a considerable time in a severe form.

89. *Q. The hair* falls out in the advanced stages of the febrile or acute cases, and becomes more and more thin, and in the mornings wet with perspiration. But in the chronic and protracted states of the disease, it generally continues abundant, or in its usual state, nearly to the last, or until a short period before death. It often falls out very early when the malady has been caused by masturbation or premature or excessive sexual excitement.

90. There are various other contingent phenomena which sometimes supervene in the course of phthisis. Some of these either accompany certain forms of this disease or result from complications which will be noticed in the sequel. Irritability of temper, nervous susceptibility, tremors, sinking, &c., are often observed in the course of the malady, are consequences of the exhaustion of organic nervous power, and the consequent impairment of assimilation and nutrition, and the waste of the tissues and blood-globules. Nevertheless, the appetite of the patient, although fastidious and various, is generally not remarkably impaired. In the more chronic cases it is often natural, or but little diminished, until the last days of life. The mental powers are not materially affected. The reasoning faculties and the imagination are even unusually acute. In some cases, of the febrile form especially, slight or mild delirium occurs towards the close, but it is seldom violent unless the membranes of the brain become the seat of increased vascular action, with or without tubercular deposits, or the treatment is injudicious.

CHAP. IV.

THE FORMS OR MODIFICATIONS OF PULMONARY CONSUMPTION.

THE *more usual form* of phthisis having been described, with due reference to its stages and prominent symptoms, and to those physical signs which indicate the commencement and progress of the malady, in as far as they are entitled to confidence, or deserve to be made the basis of diagnosis, I proceed to notice briefly the more marked forms which the disease may assume under the influence of constitution, diathesis, predisposition, and causes. On this part of my subject much may be advanced, both as topics of speculation

and as matters of important practical interest; much also may be remarked requiring further elucidation and more accurate investigation. Where the data are not positive, doubts may lead to more patient research, and to more positive knowledge.

A. THE LATENT OR INSIDIOUS FORM OF PHTHISIS.

91. This form is always insidious in its accession and progress. The patient is debilitated, indolent, mentally and physically depressed, and often complains of general malaise. Health is impaired, and lowness of spirits experienced. Emaciation is slight, and advances slowly. This state may continue some months or even years, and may be viewed as owing to nervous debility, or as approaching to hypochondriasis. The digestive, assimilating, and nutritive powers are more or less manifestly impaired; the surface is pallid and cool; the conjunctiva of a pearly hue, and the pupils usually dilated. The pulse is at first slightly or not at all accelerated, or quick or small; but becomes rapid on slight excitement, when also the breathing is short. Slight chills are afterwards felt, or a sense of cold in the course of the spine, followed by heat of the palms of the hands or soles of the feet, and an increase of pulse. A short or slight hack or dry cough is observed, especially in the morning, or after exertion, when the breathing becomes short or oppressed. These symptoms are commonly but little attended to by the patient, although they often excite the anxiety of those about him. Aching pains are also sometimes experienced about the clavicles and upper regions of the thorax, but these also often fail to excite attention, or are viewed as rheumatic. Upon examination, a slight dulness on percussion, a feebleness of respiration, and a slight tracheal character of the vesicular murmur, or a louder or longer expiratory sound are the chief physical signs.

92. Latent phthisis may occur in all temperaments, especially in the lymphatic, nervous, and bilious, and at all ages, and not infrequently in the aged. In younger persons these symptoms sometimes disappear after change of climate and judicious treatment; or they increase and are followed by the greyish expectoration attending the first stage (§ 13); but generally, after many months, or even some years, the disease passes into one of the more declared forms about to be noticed; or the patient, having either partially or altogether recovered, expectorates the calcareous concretions noticed above (§ 79), often with little cough and scanty sputa; the expec-

toration of these sometimes occurring at intervals, or ceasing permanently, recovery being complete. Most frequently, however, after exposure, or after difficult, scanty, or suppressed catamenia, or after a severe catarrh, bronchitis, or limited pneumonia, or after influenza, measles, fevers, whooping-cough, &c., and even without any manifest cause of exacerbation, the disease passes into a chronic or a protracted, but open and manifest phthisis, or into a consecutively acute form, with the usual expectoration, perspiration, diarrhoea, emaciation, &c., and with the physical signs attending the far advanced states of the malady. It often becomes associated with chronic, partial pleuritis, with or without adhesions. Hæmoptysis is not frequent in this form unless in its latter stages. The disease may continue latent in females, often masked by other ailments, as hysteria, chlorosis, uterine disorders, dyspepsia, bronchitis, or by pregnancy, until upon the disappearance of the catamenia, or after parturition, or suckling, it breaks out into an open and acute form, and terminates rapidly, generally with fever, and sometimes with delirium.

93. This form of phthisis sometimes follows depressing or exhausting *causes*, especially masturbation and excessive sexual indulgence, or prolonged or neglected dyspepsia and impaired assimilation and nutrition, or catarrhal, or bronchial affections, or hysteria, or pneumonia, or pleurisy, or affections of the throat, or partial anæmia; and these or other contingent or intercurrent disorders, may mask its early course, in both sexes, and at all ages, until it assumes one or other of the manifest forms about to be noticed. It is frequently connected in its origin and progress with a poor state of the blood, or deficiency of the red globules; this state of the blood, in connection with impaired organic nervous power, either occasioning or developing the tubercular deposits.

94. The *lesions* most commonly seen in the lungs in this form, are cicatrices in the upper lobes, with or without calcareous formations in or near their centres; crude and softened tubercles; both old and recent cavities, the former being somewhat contracted and having their surfaces smooth, or presenting a fibro-serous appearance, and adhesions both old and recent between the opposite surfaces of the pleura in one or several places.

B. PRIMARY ACUTE OR RAPID PHTHISIS.

95. This form occurs in persons apparently in good health, breaks out suddenly, and runs its course rapidly—in from five or six

weeks to three months—owing either to the extent and severity of the morbid action, or to the feeble powers and defective vital resistance of the patient's constitution. This state of the disease occurs chiefly in young persons, and is often developed by measles, fever, scarlet fever, influenza, catarrh, bronchitis, pneumonia, or hooping-cough; and although symptoms of tubercular disease were not evident before it supervened upon these maladies, or otherwise rapidly broke out, it may be inferred that it had previously existed for some time in a latent state, and that, when it had reached a certain extent, the symptoms and signs of its presence became rapidly manifest. In some cases severe physical exertion, fast running, loud speaking, has determined an attack, with more or less hæmoptysis and all the more violent and unfavourable symptoms of the malady. In these cases, the diseases just mentioned and other efficient causes have called the latent tubercular deposits into activity, not merely developing and accelerating their progressive changes, but also exciting morbid actions in the structures surrounding or adjoining them. That this view is correct is shown by the occurrence of this form chiefly in the scrofulous, lymphatic, and inflammatory diatheses, and in members of a family in which others have been subjects either of external scrofula or of phthisis. That the disease just mentioned, or attacks of pulmonary congestion, or other causes should have so rapidly given rise to tubercular deposits as the history of this form may indicate, is not very probable. It is most likely that the tubercles, at an early and latent state of their formation, had existed previously to operation of these causes, and had been thereby developed into a rapid maturity.

96. This form of phthisis may be divided into *two varieties*; viz., that in which the more characteristic phenomena of phthisis are present in a remarkable or severe degree; and that in which these phenomena are nearly if not altogether absent; the disease being often mistaken for low nervous or typhoid fever.—*A.* In the *former* of these the patient is attacked by chills, quickness of pulse, oppressed and rapid breathing, an aching pain and anxiety in the chest and præcordia, the pain or aching extending to the spine and shoulder-blades; a short cough, which is afterwards constant and severe, with a scanty and frothy expectoration at first, which soon becomes copious and yellowish; and acute hectic fever, the pulse being very rapid and soft, the remissions slight, and the perspirations excessive, and almost continued. The sputum now is generally similar to that ushering in the second stage of the more

common form (§ 26). The countenance is anxious, pale, covered with perspiration, the conjunctiva clear, and the pupils dilated; the surface of the skin has a pallid or dirty hue, the tongue is dark or loaded, and the prolabia somewhat livid; the cough, oppression, and dyspnœa are so distressing as often to prevent the patient from lying down, and the breathing is short, shallow, and rapid. Hæmoptysis to a moderate extent sometimes occurs, but rarely produces relief. Vomiting takes place in rare cases. Diarrhœa occasionally appears toward the close, but is seldom severe, yet emaciation is considerable. At last the pulse can hardly be counted, and the dyspnœa is most distressing, and the cough almost suffocating. Slight delirium supervenes, the fingers and lips become livid, the nails dark and uncared, and death ensues, from four to seven or eight weeks from the attack, preceded for a few hours either by coma, or indications of impending asphyxia. On percussion a dull sound is heard over nearly all the chest. Respiration is very weak in some places and bronchial in others, and a mucous râle is generally present. No crepitation is heard, nor is the sputum characteristic of pneumonia. It is usually yellowish, is sometimes streaked with blood, or contains small clots of blood.

97. *a.* This form of the disease generally occurs in young persons. I have seen it most frequently in females, especially after measles, influenza, and whooping-cough, and the suppression of the catamenia. In these the attack has often been produced by exposure to cold; and in some cases to which I have been called the disease has been considered either as bronchitis, or pneumonia of both lungs, both which it nearly resembles. Indeed it may be said to be very nearly allied to congestive bronchitis on the one hand, and congestive or nervous pneumonia on the other; but the previous history of the case, the scrofulous diathesis, the effects of treatment, the remarkable rapidity of breathing, the character of the sputa, and of the physical signs, indicate the difference, as well as the alliance, between these diseases, and the appearances after death fully confirm this relation. In 1853, a case of this kind occurred in a near relative; and, in 1854, I was called to a recently married couple, both under twenty-five years, both of the scrofulous diathesis, and viewed by the father of one of them, himself a physician, as possessing a strong tendency to phthisis. Both were attacked with measles a few weeks after their marriage; and on recovery they went to the sea-side. They resided there for a short time, and, on returning to town, were exposed to cold. The lady had had the catamenia in excess; but she had passed the usual

period two or three weeks, without indications of pregnancy. Soon after her exposure she was suddenly seized by chills, oppressed breathing, cough, and the other symptoms just mentioned. The attack was viewed as congestion of both lungs. External derivatives, a moderate cupping over the sternum, followed by dry-cupping in this situation and between the shoulders, and the treatment described hereafter, were prescribed. The disease proceeded as above, and terminated fatally in about five weeks. Her husband was seized in nearly a similar manner, but not so severely, very soon after her death. During her illness he appeared pallid, depressed mentally and physically, and slightly anæmied; his pulse was very rapid and weak. He had soon afterwards a very slight short cough in the morning, no expectoration, but hurried breathing on slight exertion. He did not wish to be considered ill, and refused medicine. Immediately after his wife's funeral, and more than usual exposure, he was seized with the acute symptoms mentioned above, and in a few weeks these terminated fatally, with slight delirium and coma.

98. *b. The lesions* in this form of phthisis have been considered by ANDRAL as those of a form of pneumonia, attacking the scrofulous diathesis, the grey tubercular granulations found after death being regarded by him as the results of inflammation of the air-cells. But the crude and more advanced tubercles formed in addition to these granulations, the quantity of tubercular matter infiltrating and consolidating portions of the lungs, the more general extension of these lesions throughout the lungs or to the lower lobes, the indications of vascular congestion of the pulmonary structures, and even of the bronchi, and the presence of some degree of œdema or serous infiltration of these structures; and still more the occasional existence of small recent cavities, partially evacuated of their contents, and without lining membranes, are evidences that the tubercular deposits, from their extent, and the sudden production of congestion of the pulmonic and bronchial tissues, had developed, more or less rapidly, a state of vascular actions in these tissues, of an asthenic character, that had reacted on the tubercular deposits, and had accelerated their development; the severity and rapid fatality of the disease being occasioned by the great extent of these deposits, and by the associated changes in the lungs.

99. *c. The diagnosis* of this form of acute phthisis is often difficult, the physical signs being less distinctive than in the ordinary states of phthisis. Owing to both lungs being simultaneously, and sometimes equally affected, a marked disparity in the percussion re-

sonance is not commonly manifest. There are abundant and extensively diffused deposits or infiltrations of gray, semitransparent granulations, and of yellowish tubercles, which rapidly undergo softening, leaving excavations, if the patient survive some time. Dulness on percussion is not evident if the granulations are disseminated or remain isolated. Auscultation detects only the usually morbid phenomena of acute bronchitis, such as the bubbling and vibrating sounds and the sub-crepitant râle. The vocal signs of tubercular solidification, viz., exaggerated resonance, bronchophony, fremitus, are wanting. The prominent symptoms are at first chills, alternating with febrile action, heat and dryness of the skin, followed by great debility, rapid pulse, hurried respiration, copious perspiration, dyspnœa and lividity of the prolabia. Cough is more or less violent, at first often dry or attended by slight expectoration which is sometimes bloody or streaked with blood, but chiefly in adults. Emaciation is usually not so marked as in ordinary phthisis, owing to the rapidity of the disease. This form of phthisis is liable to be mistaken for acute or asthenic bronchitis, or for asthenic pneumonia, low or typhoid fever, &c.

100. *B. The second variety* of acute phthisis closely simulates either nervous, remittent, or typhoid fever, according to the modifications it presents in individual cases, whilst the *first variety* closely resembles congestive or nervous pneumonia in some respects, and asthenic bronchitis of both lungs in others (*see BRONCHITIS, &c.*—*a.* This variety of acute phthisis is rarer than the preceding, and has not been noticed by those who have adopted diseases of the lungs for their speciality, the examination of the bared chest for the grand *coup* of fussy diagnosis, and the stethoscope as the baton of transcendental medical knowledge, if not of actual inspiration. This neglect is most extraordinary on the part of those who usually consider every case which comes under their view as pertaining to that region of medical science which they suppose themselves to be alone capable of cultivating. As in the preceding variety, so in this, the patient has appeared in good health, and if he have not felt this to have been the case he has not admitted it; nor have his friends detected it until he is seized by an outbreak of disorders which obliges him to keep to his bed and have recourse to medical aid. If this aid be of a proper kind, it will be found and admitted, at least in some cases, that a degree of ailment had been experienced for a considerable time before the accession of acute disease; that depression of spirits, indolence or indisposition to mental and physical exertion, debility,

loss of appetite or indigestion, acceleration of breathing when ascending a height, weakness in the joints, occasional chilliness, followed by heat in the palms of the hands or soles of the feet, especially during the evening and night, some degree of restlessness in the early part of the night, loss of colour or complexion, in some cases loss of flesh, an unusual brightness of the eyes, a bluish-white appearance or pearly hue of the conjunctivæ and dilatation of the pupils, &c., had been present for some time, but that each or all of these were so slight as not to excite the anxiety of the patient, or they were not so manifest as to rouse the fears of his friends. The patient now feels a general prostration, has a quick pulse, with the usual symptoms of a remittent form of fever, which in a few days assumes a more continued type, the symptoms being, however, somewhat severer on alternate days. The bowels become irregular, at first confined and afterwards inordinately relaxed; the perspirations are usually abundant; the tongue is foul or loaded; the urine rather scanty and high-coloured, with copious deposits; the position in bed is on the back, with the head and shoulders more or less raised, or partially turned to either side; the features are somewhat sunk, the face pallid, and the general surface dusky, with a clammy perspiration, which is abundant over the head, face, neck, and chest; and aching or dull pains are occasionally felt about the clavicles, in the back, and under the scapulæ. During the course of these symptoms little or no cough is observed; if it be present it is commonly slight, dry, and insufficient to attract attention; but the breathing is remarkably quick, somewhat oppressed, and shallow. There is little or no expectoration, the sputum and other local symptoms being insufficient to direct attention to the state of the lungs, or to excite suspicions of the existence of rapid febrile phthisis; both cough and expectoration being apparently absent. The pulse is more and more rapid, slight or wandering delirium occurs, especially when the patient dozes or falls into a waking sleep; the hair becomes thin; the finger nails bent inwards; the surface more dusky; the emaciation very rapid and extreme; and bed sores readily form on the more prominent parts. Death soon ensues, generally in four or five weeks from the commencement of the acute attack, either from the exhaustion consequent on diarrhœa, or from coma, or sinking following delirium.

101. *b. The morbid appearances in the lungs, &c.*—I have seen several cases of this variety of febrile consumption, to most of which I was called in consultation at an advanced period of their

course; and at that time the symptoms and signs of phthisis, in its third stage, were more or less manifest, upon a careful and minute examination, and with due reference to the history of the case and to the health of other members of the family. In four of these an *inspection after death* was allowed, and in all several cavities were found in both lungs mostly altogether empty and nearly dry. The blood in the lungs was of a very dark colour and only partially coagulated; few or no adhesions were found between the opposite surfaces of the pleura; and the lower lobes were as much diseased as the upper. The intestinal follicular glands, both solitary and aggregated, were more or less enlarged and ulcerated. Three of these cases occurred in females. The youngest was 18 years of age, the oldest of all was 29 years. It may be inferred, that the cavities, which were small, mostly empty, and the smallest only, in two or three instances, full of these usual tubercular and fluid matters, had not communicated with the bronchi, or that the bronchi in connection with them had been rendered impervious in the parietes of the cavities, from the condensation of the surrounding tissues, and that the morbid matters in these cavities had been absorbed, had contaminated the blood, and occasioned acute febrile symptoms of a typhoid or adynamic character. The circumstance of the softened tubercular matters, and the morbid fluids flowing into the cavities from their ulcerating parietes, not having passed into the bronchi, accounts also for the absence not only of expectoration but also of cough; whilst the emptiness of the excavations shows that their contents must have been absorbed, and been carried into the circulation, the contamination of the blood thereby produced occasioning the acuteness, the rapidity, and the typhoid or adynamic character of the attendant fever.

C. CONSECUTIVELY ACUTE PHTHISIS.

102. This variety is different from the two preceding varieties, chiefly as regards the character and duration of the symptoms preceding the exacerbation of the disease, and the development of the more acute and dangerous form. In the preceding varieties the patient seems in tolerable health to those about him, and believes himself to be so, until the acute symptoms make their appearance, although the experienced observer cannot fail to remark indications of the approaching evil.—*a.* But the variety now about to be noticed is preceded by a slower and more manifest disorder of the

respiratory functions than that preceding these varieties, and is in every way similar in its early course to the *latent* form of the malady, described above (§§ 77, *et seq.*), although by no means latent to any attentive observer. After pallor of the countenance, or slight indications of anæmia, with or without emaciation, debility and inactivity, mental depression, languid or soft pulse, shortness of breathing, or short cough on exertion, and sometimes after the expectoration of calcareous concretions, have continued for a very considerable or even a long time, or for several months, or even years; and generally soon after exposure to cold, or after unusual exertion, the patient experiences chills or shiverings, or a sense of cold running down the back; or he is seized with hæmoptysis, and all the acute symptoms are fully evolved. Hectic fever, at first remittent, but afterwards nearly continued; a rapid, weak pulse: very quick respiration; cough and copious expectoration; pains about the clavicles, scapulæ, or the sides, or the upper regions of the chest; colliquative perspirations, diarrhœa, rapid emaciation, aphthæ, sometimes with, but oftener without, slight delirium, ultimately supervene, and terminate life. This form of consumption is much more common than the preceding acute forms, and may be viewed as an acute or actively developed state of the pre-existing chronic disease, induced by one or more of the various superadded causes, to which the earlier stages of the usual, or the more latent, forms of the malady are often exposed.

103. *b. The lesions of the lungs* most frequently observed after death in this variety are tubercles in various states of softening; small, or nearly cicatrised, or contracted cavities, with gritty, calcareous, or cheese-like matters in or near their centres; larger cavities, partially empty or containing blood, if hæmoptysis had preceded dissolution, and their parietes varying in appearance with their duration; condensation of the pulmonary tissue around the excavations, or congestion of portions of the lungs, and redness of the bronchial mucous membrane, &c.

D. PROTRACTED PHTHISIS.

104. This form may commence either in the usual form, or continue for years, first in a more or less latent, and afterwards in a manifest state. It occurs chiefly in the phlegmatic and bilious temperaments. It is often characterised by slowness of the pulse, which seldom rises above 70, and often not above 65 in a minute.

by attacks of hæmoptysis, or more rarely by the expectoration of calcareous concretions; but when the latter occurs, I have very seldom observed the former, unless in a very slight degree. It is sometimes simple or uncomplicated, but it is oftener associated in various periods of its course with one or other of the affections and lesions about to be mentioned. The nature of the disease is generally manifest; and the experienced observer will rarely fail to form a correct diagnosis, even without the aid of a physical examination, between it and bronchitis or chronic pneumonia, with either or both of which, however, it is often associated at different periods, and even also with partial pleuritis. Percussion and auscultation are of use chiefly as showing the progressive changes and complications of the disease, although they are liable to the fallacies noticed above (§§ 35—37.), owing mainly to the states of the cavities, when they exist, and of the bronchi, arising from the presence or absence of the morbid matters that usually collect in them.

105. Several cases of very protracted phthisis have come under my notice, several of them in medical men. Dr. T. was attacked by hæmoptysis at the age of 20 when studying in Edinburgh. His circumstances having admitted of his relinquishing practice soon after entering upon it, and having experienced returns of the hæmorrhage with other pectoral symptoms, he travelled or voyaged to several parts in the West Indies, and in the south of Europe, generally passing a part of the year in one or other of these, and returning to England in the summer. Nevertheless, his phthisical symptoms never left him, were exacerbated after considerable intervals, and the hæmoptysis also returned, and was sometimes alarming. This state of health continued for many years, and he continued to pass his winters in some mild climate, most frequently in that which he found to agree the best with him. At about the age of 57 or 58 he first called upon me, told me his case, and informed me that he had consulted several eminent physicians, and that they were almost equally divided as to the existence or non-existence of cavities. I told him after a careful examination, that there were cavities in both lungs, but that they were small, and that they were most probably filled up by the accumulated morbid secretions for a considerable time, and thus they escaped detection. He continued under my care for several years, during the periods of his residence in London or its vicinity. But the attacks of hæmoptysis were more frequent, so much so ultimately that he always carried with him pills consisting of the ergot of rye, and a bottle of turpentine. He took the former as soon as the hæmor-

rhage appeared, and if that failed, he had recourse, as I had directed, to the turpentine. These means generally succeeded, but the other pulmonary symptoms gradually advanced. When about the age of 67, he was seized with hæmoptysis when getting out of a railway-carriage at Paddington, had recourse to his usual remedies, and sent for me. Before I reached his residence he was dead, suffocated by the hæmorrhage. The body was inspected the following day. Several cavities were found in both lungs. None of them was large. The smaller were apparently contracted; their parietes were smooth, fibro-serous, and almost fibro-cartilaginous in parts; and one or two of them so much reduced as to be almost cicatrised; the parietes being quite smooth and fibro-cartilaginous. The surrounding tissue was condensed. Some of the cavities had a membranous parietes, whilst in others the walls consisted of a somewhat condensed pulmonic tissue, with minute openings, chiefly venous or bronchial. The cavities were all filled with blood, as were also the larger bronchi, and contained but little muco-puriform matter. This case had evidently been of forty-four years' duration; and it presented appearances, as respected the cavities, of the longest and shortest duration.*

* Dr. W. H., who had been Editor of the "London Medical and Physical Journal" in the years 1820 and 1821, in 1825 evinced indications of pulmonary disease, and in the following year he had a most severe attack of hæmoptysis. He came under my care, and I advised him to pass the following winter at Naples. He returned to England in June, but was more or less of an invalid all the summer and autumn. He went to the coast of Devonshire the next winter; and he thus continued to change his place of residence for many years, often returning to London or its vicinity during portions of the summer and autumn. The pulmonary symptoms were sometimes slight, at other times severe. He died about 28 years after the attack of hæmoptysis, in the vicinity of London. The treatment of this case, and of Dr. T.'s, was conformable with that which I shall have to recommend in the sequel.

Miss L. came under my care about fifteen years ago, in the third state of phthisis. The symptoms and signs of cavities in the lungs had previously been recognised by the physicians whom she had previously consulted. When I saw her these were unmistakeable. During the years which have intervened since my first visit, she has experienced intercurrent attacks of bronchitis, of partial pleuritis, &c., which have been successively overcome; and during the severe winter and spring of 1855, and up to the present time, she was not confined a day to her apartment, and but rarely to the house. The physical signs and chief symptoms of cavities in the lungs still exist. I could adduce numerous instances of the protracted form of this disease, if it were necessary to do so, in many of which recovery was more or less complete. Sir H. SLOANE, (the founder of the British Museum, and President of the Royal College of Physicians), had hæmoptysis at seventeen years of age, passed several years subsequently in Jamaica, had always delicate health, yet lived, with great care of himself, chiefly in Chelsea, until he was ninety-two years of age.

CHAP. V.

TUBERCULAR PHTHISIS IN INFANTS AND CHILDREN.

106. THIS disease occurs chiefly in the scrofulous diathesis, or as a consequence of protracted or neglected disorder of the digestive and assimilating functions, which in children may generate both the scrofulous diathesis and tubercular consumption. Disorder of these functions may in all temperaments so affect the circulating fluids as to develop that habit of body, in early life, which constitutes the scrofulous cachexia, and which, in its more manifest states, implicates not merely the lungs, but other organs also. I have shown, in another work, when treating of *Scrofula* and *Tubercles**, that the scrofulous diathesis may either be inherited or generated by the parent, and by the offspring in childhood, by causes which depress or exhaust organic nervous power—impaired digestion and assimilation of the hæmotosine, and imperfect nutrition resulting therefrom, and thus engrafting scrofula and tuberculosis upon any temperament. It is therefore most important that this disorder of the digestive and assimilating functions in childhood should be recognised and traced to its causes, and that these causes should be removed.

Pulmonary consumption presents certain characters which are common to all ages, to all races, and to both sexes; but in the early epoch of existence, especially up to twelve or fifteen years of age, there are various peculiarities or *distinctions* which require particular notice:—1st. The tubercular taint or cachexia manifests itself differently in childhood and in adult age. In the latter period, and in proportion as it is approached and as it is advanced, the lungs are the chief and frequently the only evident seat of disease. But, in the child, especially under ten or twelve years of age, though the lungs are most frequently affected by tubercular deposits, *other organs participate* more or less, and much more frequently than in adults. M. LOUIS found that if tubercles be discovered in any internal viscus, in adult subjects, they will also be found in the lungs; and in 123 cases there was only one exception to this rule. In children, however, though the lungs are most frequently thus affected, yet the exceptions are much more numerous. MM. RILLIET and BARTHEZ found 47 exceptions out of 312 cases. Hence it follows that one of the chief differences of tubercular disease in childhood and in adult age is the different

* See *Dict. of Pract. Med.* vol. iii. p. 732 *et seq.*

liability of the same organs and structures at these periods of existence. The following table is quoted from Dr. WEST's work:—

“Of 100 instances in which tubercle was deposited in some of the viscera, it was present in—

	Children up to 15 years.	Adults from 20 years and upwards.	
	According to Rilliet and Barthez.	According to Louis	According to Lombard.
In the lungs	84	100	100
bronchial glands	79	28	9
mesenteric glands	46	33	19
small intestines	42	33	0
spleen	40	13	6
pleura	34	2	1
peritoneum	27	0	0
liver	22	0	1
large intestines	19	10	0
membranes of brain	16	0	2
kidneys	15	2	1
brain	11	0.8	2
stomach	6	0	0
heart and pericardium	3	0	0

107. 1st. Thus it will appear that tubercles in childhood are more disseminated, or exist simultaneously in a greater number of organs, than in adult age. I agree with Dr. WEST (see his work on the “*Diseases of Infancy and Childhood*,” p. 447), in considering that this partly accounts for death sometimes taking place in the child before tubercle has anywhere undergone those changes which usually precede the fatal event in the adult.

2nd. The *conformation* or character of tubercular deposits in the lungs of children often differ from that commonly observed in adults. The first peculiarity consists in “the frequency with which grey granulations and crude miliary tubercles exist in the lungs independently of each other, and of any other form of tubercular deposit. M. LOUIS found miliary tubercles alone in the lungs of adult subjects in 2 only of 123 cases; and grey granulations alone only in 5 other instances. MM. RILLIET and BARTHEZ detected miliary tubercles alone in 107, and grey granulations alone in 36, out of 265 cases; and Dr. WEST found 20 instances of miliary tubercles alone, and 17 of grey granulations alone in 102 cases. But the yellow infiltration of tubercle in the lungs of children is generally observed, associated invariably with grey granulations or yellow tubercles, and sometimes with both, and generally with a

far advanced tuberculisation of the bronchial glands. MM. RILLIET and BARTHEZ met with yellow tubercular infiltration in 33 per cent of their cases, and Dr. WEST in 22·5 per cent. It is often limited to one lobe, generally the upper, but sometimes the middle, especially of the right lung. The portions thus affected are converted into a firm cheese-like mass, which, if the patient's life be prolonged, becomes softened, breaks down, and a cavity results, the parietes of which consists of solid tubercular matter. These deposits seem to confirm the theory of ROKITANSKY, that tubercles in the form of grey and yellow granulations are deposited in the interstitial tissue of the lung; and that tubercular infiltrations arise from the matter exuded into the pulmonary vesicles during inflammation that becomes converted into tubercles by the tubercular cachexia.

3rd. *Cavities* are much more rarely formed in the lungs of children than in adults. Whilst cavities are formed in a very great majority of cases in adults, they have been observed only in about 24 per cent. of cases in children, and in them are generally small and numerous, sometimes very numerous, especially when they result from the softening of small tubercles. The cavities, however, which result from the softening of yellow tubercular infiltration sometimes form with great rapidity, often attain a very great size, presenting the appearance of a sac and occupying a whole lobe.

4th. Tubercles exist in the *bronchial glands* in about a fourth of the cases of phthisis in the adult; but the deposit in the glands is generally consecutive of and subsiding to the deposit in the lungs; but in children the disease of the glands is as important and often more considerable than that in the lungs. The tubercular deposit in the bronchial glands may present all the forms already described. It most frequently commences in the glands about the bifurcation of the trachea. The affected glands are somewhat enlarged and injected, infiltrated with fluid and less consistent than usual. The deposit most frequently presents the character of tubercular infiltration which has taken place at the same time in different situations. As the disease advances, the substance of the gland becomes converted into a firm tubercular matter, in which the original tissue cannot be detected. The diseased gland is increased in size, and its cellular envelope is also more dense and firm, and is considerably thickened. Tuberculosis of the bronchial glands is most frequently found in the crude state; but if the patient's life be prolonged, softening takes place, gene-

rally commencing in the centre of the glands, and extending to their circumference. The tubercular degeneration as it advances, often occasions perforation of the bronchi, and in rare cases it causes, by the same process, perforation of the œsophagus, tracheæ, and large vessels. As in tubercles of the lungs, so in those of the bronchial glands, their progress is sometimes arrested, and they are reduced to the cretaceous condition.

5th. In children the tubercular cachexia is more frequently manifested in the external and superficial glands, and in the bones, especially of the spine and extremities, either simultaneously with internal tuberculosis, or in the former more especially, than is observed in the adult. The amount of difference between these classes of subjects, in respect of internal and external tuberculosis, and the frequency of the association of both manifestations or of the existence of either separately, especially in young subjects, have not been ascertained, or rather have not engaged the attention of those who have enjoyed the opportunities of investigating these topics.

108. SYMPTOMS. The aspect of children, even at an early stage of phthisis, suggests the idea of a low state of organic nervous or vital force. The child is languid or fretful; the flesh is flaccid; the skin harsh, dry, and unhealthy to the sight and touch. It is disinclined to play or to active exercise; or is incapable of leaving bed or the nurse's lap. The face is pasty, or faded. The eyes appear large; the pupils are dilated, and the conjunctivæ white. The tongue is whitish, and dotted with small red points, the extremity and sides being red, and the root and centre loaded, or more or less furred, especially in the morning. The appetite is variable, often craving or unnatural; thirst is not infrequent, and the breath is fœtid. The bowels are irregular, most frequently costive, but sometimes very loose; and the evacuations are offensive, often pale, greyish or clayey: occasionally mucus and imperfectly digested food are observed in the stools. The urine is either high-coloured at times, scanty or abundant, turbid or pale. The extremities are usually cold; and sleep is disturbed, and often followed by partial night-sweats. The child often talks when asleep, or grinds his teeth; and hence the complaint is often ascribed to intestinal worms, with which, however, it is not infrequently complicated.

109. As the complaint continues, the symptoms are not only increased, but others are superadded. The countenance is more faded and pasty; the upper lip is thick, tumid, or fissured; the

throat and fauces red or sore, or the tonsils enlarged; the eyelids and tarsi are inflamed, or the pupils are dilated, the conjunctivæ pale or pearly; the nostrils are somewhat swollen or sore, or discharge a thick mucus, and mucus, mixed occasionally with blood, is passed from the bowels with frequent offensive and griping motions. These symptoms may continue for some time, the flabbiness and emaciation increasing, and becoming associated with quick respiration, cough, and mucous expectoration, occasionally streaked with a little blood. The skin is harsh and dry, but sweats break out during the night; languor and debility increase; the pulse and respiration are greatly accelerated, and the quickness of the latter relatively to the former increased. The pulmonic symptoms become, in most cases, more manifest, but vary much with the age and temperament, or habit of body, of the child. In the very young, they are often marked by disorder of the bowels, which frequently appears urgent, and is more or less connected with tubercular deposits in the mesenteric glands. In others, the great size of the head and the emaciated state of the limbs lead to the suspicion of incipient disease of the brain or its membranes, which indeed may be actually commencing, either as softening of the central parts of the organ, or as tubercular formations in the membranes; but these changes, as well as those in the mesenteric glands, may be contemporaneous with tubercular deposits in the lungs also, the amount of disease in this organ either predominating or advancing *pari passu* with that in the others. In many, especially the very young, the pulmonary tubercles never reach the stage of dissolution and tubercular vomicae, the disease of the brain, or of the mesenteric glands and bowels, or the extent of tubercular infiltration of the lungs, even of the lower as well as of the upper lobes, terminating life before this stage is approached or advanced, although the emaciation, and the oppression and acceleration of breathing, are extreme.

In these cases the cough and expectoration may be slight; but the dulness on *percussion*, and impaired motion of the ribs, are generally remarkable. The other *physical signs* are nearly the same as stated above in respect of the early stage of phthisis (§§ 24, *et seq.*); but those of percussion are more to be depended on than of auscultation, especially in young children; and, in those particularly, hæmoptysis rarely occurs, unless at an early period, and then as merely streaking the expectoration: but slight epistaxis is sometimes observed, especially when the bronchial glands are implicated.

110. THE DIAGNOSIS of *Phthisis in Children* is often very difficult, especially in young children, owing in great measure to the early stage being marked by the association with disorders of the digestive mucous surface and other parts, and more especially with intercurrent attacks of catarrh, or of bronchitis, or of pneumonia. In an early, and even in an advanced stage, it is often mistaken for the remittent fever of children. The number of organs in which tubercular deposits more or less occur also increases the difficulty of diagnosis. The dissemination of the several forms of deposit through the lungs, although greater in the superior lobes, generally is attended at first by little or no cough, excepting a short, slight, and dry cough. The child appears only to droop, to lose flesh, but the skin becomes hot and dry as night approaches, and the child has no interest in its usual amusements. The breathing is quick, short, wheezing, and superficial. As the disease advances, hectic, with night sweats, especially about the neck, chest, face, and head, is more fully developed; the cough becomes attended by more or less expectoration, which in young children no sooner passes from the larynx than it is swallowed. Diarrhœa ultimately supervenes, and is often followed by aphthæ. The child is generally carried off by exhaustion or by intercurrent attacks of pneumonia or bronchitis; but hæmoptysis, unless a slight tinge or streak of blood, rarely occurs unless in the older children.

111. The *bronchial phthisis* of children often originates as now stated, especially in catarrh, bronchitis, influenza, or whooping cough, and in many cases is mistaken for this last named disease, owing to the greater severity of the cough attending this form of phthisis, and to the circumstance of the cough frequently occurring in paroxysms and terminating in vomiting. The breathing is oppressed, wheezing, and difficult; the face tumid, and the veins of the neck distended. In addition to these indications, and after various fluctuations in the severity and associations of the symptoms, the signs of associated tuberculosis of the lungs become more and more manifest, and emaciation, with flaccidity of the structures, increases. In this state of the malady, as well as in the more common form, hæmoptysis rarely occurs in children, but diarrhœa, aphthæ, tuberculosis of the mesenteric glands, and often of other structures, complicate the disease, and accelerate a fatal issue.

112. The *Auscultatory Signs*, although deserving of attention in the phthisis of children, are, upon the whole, and at an early stage especially, not to be so much depended upon as in the phthisis of

adults. The disease in the former, though the chest may be carefully examined, is often detected with great difficulty, and may not only originate in, but be masked by, the remittent states of fever, by pertussis, or by bronchitis, by influenza, and by gastric or gastro-enteric fever. The close observation of the physician, in these complaints, directed especially to the presence or absence of the scrofulous taint, to the functions of respiration, to the physiological and constitutional symptoms, and to the signs furnished by percussion and auscultation, will generally prove the safest guide in the more latent or difficult cases. The younger also the child, the more general are the tubercular deposits in the several organs, especially in the lungs, in the bronchial glands, in the mesenteric glands, membranes of the brain, &c., as shown above (§§ 106 *et seq.*)

CHAP. VI.

PULMONARY CONSUMPTION IN THE NEGRO AND IN OTHER DARK RACES.

113. THE Dark Races are more exempt from phthisis whilst they remain in the countries of which they are indigenous, than the white races are; but very much depends upon race, upon intermixture of races, upon residence in the same or similar climate, on the one hand, and upon migration to a colder climate, on the other. Of the degree of prevalence of this malady in different races, some notice, although insufficient, will be taken in the sequel; and I can here only mention the much greater prevalence of this malady in these races, especially the negro race, when they migrate to a temperate, or a cold or changeable climate.

Dr. Lee, in the American Edition of my *Dictionary of Practical Medicine*, remarks that of the blacks who escape from the Southern States to Canada, a large number perish within the first five years from tubercular and scrofulous affections; and the same remark applies to individuals of the negro race who are brought to Europe; pulmonary consumption being the malady to which they are most liable. He adds that "in the city of Baltimore, for the year 1850, the mortality among the blacks from phthisis was 50 per cent. greater than among the whites—the males being 43·5 per cent. to 56·5 per cent for the females."

114. As to the usual course of the disease, when it attacks individuals of either a black, brown, or copper-coloured-race, I am not enabled to speak with confidence; but, from what I have seen, it commences silently and insidiously, and advances more and more openly and rapidly to its fatal issue. In some cases the attack appears as a vital blight, by which the lungs are especially affected; a lower range of temperature or greater exposure than heretofore experienced, or other depressing or exhausting causes, whilst they impair organic nervous power, and the assimilating functions thereby develop tubercular deposits in the lungs, as the parts most predisposed, by structure and exposure, to experience this morbid change, generally without any inflammatory precursors or complications. These races, as far as I have had occasion to observe, rarely or never present the protracted and very chronic states of the malady sometimes seen in the white races; whilst the more rapid or acute forms are frequently met with, but these generally with fewer indications of febrile or excited vascular action than in the white races. Hæmoptysis is, I believe, less frequently observed as a symptom or complication of the disease in the negro than in the latter races, whilst it is a severe and frequent symptom in the mixed races of South America.* In these races generally consumption is more or less prevalent according to climate, locality, &c.

* DR. ARCHIBALD SMITH, in a very interesting *account of the Diseases of Peru*, states that "in Spring, a season when many severe cases of pneumonia present themselves, the commonest catarrh generally appears under a more febrile form, and when it unfortunately affects one of a consumptive tendency, it is frequently the exciting cause of a galloping decay. For at this season it is remarked that consumptive patients, with which the hospitals in Lima are well supplied, die very speedily, while at other seasons they linger on for a longer period. Persons who are habitually subject to chronic *bronchitis*, and troubled with what they call crude phlegm, or much mucous expectoration, are apt to fall into a fatal decay, as a consequence of an acute attack originating in cold; and others, who have been in a lingering state of health for some time, with a slow fever and a short dry cough, or a cough accompanied with expectoration, especially in the morning, of clear and frothy sputa, are prone to have their fever increased, and to be hurried into a state of catarrhal consumption. In cases of the latter kind, it is probable that tubercles may have previously existed in the lungs, and that the exception of catarrh only serves to bring phthisis into more decided action. And, indeed, it may be made a question whether those cases of chronic bronchitis to which I have referred may not, sometimes at least, be instances of bronchial irritation, and consequent expectoration of a mucous secretion, sustained by the presence of tubercles. Whatever be the particular form or primary character of pulmonary consumption, certain states of the atmosphere, depending on different degrees of altitude, appear to be either hostile or favourable to its existence or development, according to the particular locality in which the patient happens to reside. Thus on the coast it is a common disease, terminating in purulent expectoration and death, in whatever way it may have originated; but, on the intermedial mountains, and in the temperate valleys of the interior, pulmonary consumption is a rare malady.

CHAP. VII.

THE STATES OF THE BLOOD IN PHTHISIS.

115. Before a precise idea can be formed of the states of the blood in this disease, the healthy conditions of the blood should be considered, with reference to *sex*, *age*, and *temperament*, in order that the degrees in which the former differ from the latter may be seen. It should not, however, be overlooked, that the *chemical analyses* of DENIS, LECANU, BECQUEREL, RODIER, ANDRAL, NASSE, GAVARRET, SIMON, &c., have presented slight differences, even at the same age, in the composition of the blood in health, so that the results at which they have arrived may be viewed rather as a close approximation to the truth than as absolute certainty. In addition to the

“A failure of strength and health coming on gradually, or as it were by stealth, with impaired appetite, a slight dry cough, with or without pain at the breast or shoulders, a febrile pulse, with nocturnal heat and restlessness, are symptoms frequently precursory of those which characterise confirmed consumption. This slow fever, so much dreaded by every one as the harbinger of phthisis pulmonalis, and often aggravated by daily provocations, or fretfulness and anger, is always accompanied, if not always preceded, by a diseased condition of the digestive functions. This affection is, I think, well described by TISSOT as a disease to which men of letters are subject:—‘This slight fever, to which some men of letters are liable, and which, by impairing the nutritious lymph, renders them pale and thin, and throws them at last into a state of decay and consumption, a fever which itself depends on this, that sometimes a strong mental emotion excites the action of the heart and accelerates its pulsations; but more frequently it arises from bad digestion, and a faulty condition of the chyle, which irritates the organs of circulation, and so becomes the cause of the fever; and, also, if the organs of respiration are delicate and sensible, of a cough, which, united to the fever, may degenerate into hectic fever and phthisis.’—*De la Santé de Gens des Lettres*, p. 33. In conformity with these views, which are as applicable to the ordinary cases of incipient phthisis in Lima, as to the explanation of the origin of pulmonary affections in men of letters, according to TISSOT, I would remark that the chests of the Limenos, especially the male part of the white population, are commonly contracted; very rarely open and spacious, except among the dark and labouring classes; and every practitioner entrusted with the medical treatment of these people should constantly bear in mind that their respiratory organs are so delicate and easily affected, that sometimes shaving and washing the face in cold water bring on catarrh; and I have already shown how this latter affection may be the precursor of confirmed consumption.”—*Edinburgh Medical and Surgical Journal*, vol. liv. pp. 6—9.

DR. A. SMITH has here shown the very intimate connection of phthisis with impaired digestion and assimilation, and the want of originality, as well as the limited views of those writers who, since the days of TISSOT, have espoused a somewhat similar doctrine. Of *hæmoptysis*, in connection with phthisis in Peru, DR. A. SMITH remarks:—“Spitting of blood from the lungs is exceedingly common in Lima, and not confined to persons of any particular class or colour, though more prevalent among the fairer inhabitants of European descent;” and he points out the frequency of attacks of hæmoptysis, not only as a prelude, but as an attendant upon the early stages of consumption amongst the several races peopling Peru.

differences arising from sex, age, and temperament, others hitherto not inquired for, may also exist, especially those depending upon race, climate, and season. After examining the mean results furnished by the above writers, I here give those assigned by BECQUEREL and RODIER, as the most precise and as nearly approaching the mean of the other observers.

116. *a.* The following table, containing the mean of a number of analyses of the blood of *healthy* persons, between the ages of 21 and 55 years, shows the differences between the constituents of this fluid in *males* and *females*, in 1000 grains, or parts.

	Male.	Female.
Density of defibrinated blood	1060·0	1057·5
Density of serum	1028·0	1027·4
Water	779·0	791·1
Fibrin	2·2	2·2
Sum of fatty matters	1·60	1·62
serolin	0·02	0·02
phosphorised fat	0·488	0·464
cholestrin	0·088	0·090
saponified fat	1·004	1·046
Albumen	69·4	70·5
Blood corpuscles	141·1	127·2
Extractive matters and salts	6·8	7·4
chloride of sodium	3·1	3·9
other soluble salts	2·5	2·9
earthy phosphates	0·334	0·354
iron	0·566	0·541

117. *b.* The differences of the constituents of the blood at different *ages* have not been determined with sufficient precision; but according to the researches of DENIS, the water in the blood is somewhat increased after 50 *years* of age, the solid residue slightly less, the blood-corpuscles are materially diminished, and the albumen nearly the same in quantity. In *childhood*, the water is increased, the solid residue somewhat less, the blood-corpuscles considerably less than at mature age, and the albumen nearly the same as at that age. BECQUEREL and RODIER state that, after 40 or 50 years of age, there is a decided and progressive increase of cholestrin in the blood. As puberty approaches and as the generative organs are developed, the blood-corpuscles and iron increase, and the relative proportion of water diminishes; the corpuscles and iron serve to maintain the energy of these organs; and until the powers of these organs begin to flag, the blood experiences little or no diminution of its red corpuscles.

118. *c.* The *constitution* has considerable influence on the state of the blood. At equal ages, the solid constituents and hæmato-

globulin are less abundant in the blood in weak than in strong constitutions. According to LECANU and others, the blood of persons of *lymphatic* and *phlegmatic temperaments* is much poorer in solid constituents, and especially in red globules, than that of persons of sanguineous temperament; the quantity of albumen being the same in all. The following are the results in 1000 parts:—

	Sanguineous Temperament.		Lymphatic and Phlegmatic Temperament.	
	Men.	Women.	Men.	Women.
Water	786.584	793.007	800.566	803.710
Albumen	65.850	71.264	71.781	68.660
Blood Corpuscles . . .	136.497	126.174	116.667	117.300

119. *d.* The *chemical analysis* of the blood in threatened and incipient phthisis furnishes the same results as those stated when treating of SCROFULA AND TUBERCULOSIS (§§ 93, *et seq.*)* When phthisis is further advanced, the changes in the blood are more and more manifest. ANDRAL and GAVARRET state that, in all periods of the disease, excepting the last, the fibrine seems on the increase, and the red corpuscles are on the decrease, progressively throughout; but that the proportion of the increase on the one hand, and decrease on the other, varies with the progress of the malady. If the tubercles be in a crude, unsoftened state, the increase of fibrine is only small, and its whole amount may be estimated at about 4. This, however, according to the researches of DR. FRICKE, of Baltimore, and others, is too high an estimate. The decrease in the corpuscles in this stage is perceptible, but not very great. As the tubercles soften, the quantity of fibrine slightly increases, and the corpuscles decrease. Upon the formation of vomicæ, or cavities in the lungs, the fibrine is somewhat further increased—to 5.5 according to ANDRAL—but it never reaches the amount observed in pneumonia. The results vary, however, with the nature of the associated lesions, which most of chemical observers have not taken into the account; for the occurrence of severe attacks of hæmoptysis, or of partial, sub-acute, or chronic pneumonia, or pleuritis, or peri-pneumonia, will increase the fibrine and greatly diminish the red globules. In the last stage of phthisis the blood becomes still poorer; the fibrine decreases in nearly the same ratio as the other

* *Dict. of Pract. Med.* vol. iii. p. 748—750.

solid constituents, and even often falls below the healthy standard. The following table furnishes the results of 22 analyses by ANDRAL and GAVARRET, and 9 by BECQUEREL and RODIER, in 1000 parts, of the blood in phthisis:—

	In Men.			In Women.	By Andral & Gavaret.
	1st Vene-sect.	2nd Vene-sect.	3rd Vene-sect.		
Water	794.4	799.8	821.0	796.8	809.7
Solid Constituent	205.2	200.2	179.0	203.2	190.3
Fibrine	4.8	4.2	3.6	4.0	4.4
Fat	1.55	1.44	1.06	1.729	
Albumen	66.2	65.0	62.0	70.5	
Blood Corpuscles	125.0	122.7	103.5	119.4	100.5
Extractive Matter and Salts .	7.7	6.7	8.9	7.6	

120. Mr. ANCELL has adduced the results of a great number of researches into the constitution of the blood in phthisis. He views the disease to derive its origin from morbid states of the blood. The chief differences existing between the opinions of that gentleman and those entertained by me, as stated under the head SCROFULA and TUBERCLES (§§ 101, 102)*, are, that I consider the changes observed in the blood, the nature and extent of which I have fully admitted and described, not as the origin of tuberculosis, but as effects of an originally deficient, or consecutively impaired, vital force, manifested chiefly by the organic nervous system—by that system which endows the digestive, assimilating, circulating, and nutritive organs; defective assimilation of the chyle, and an unhealthy condition of the blood, being the consequences of this state of the organic nervous system, and only intermediate links in the chain of pathological results, the extremities of which chain are the state now assigned and the tubercular lesions.

121. *e.* I may adduce the following as the results of my own observations of the state of the blood in the early and in the advanced stages of phthisis:—At an early period, or even before the disease has fully declared itself, the blood is thinner or poorer than in health; the colourless globules are more or less abundant, and the red globules less numerous; the clot is somewhat smaller, its crasis less, and it sooner loses its cohesion. As the disease advances, and as febrile action is established, the fibrin is somewhat increased, and this is more certainly the case, if hæmoptysis, or intercurrent

* *Op. Cit.* t. iii. p. 748—750.

inflammations of any of the pulmonary structures take place; the red globules are diminished, and the albumen and fatty matter are not very materially changed in quantity. The alkaline salts are slightly deficient, and lime is somewhat in excess. It should not, however, be overlooked, that, among the numerous analyses of the blood in phthisis, there are very great differences in the quantity of fibrin, of albumen, and of fatty matter. I have here given what appears to be the more correct results. Probably the quantity of each of these is not so different as the quality, the intimate constitution, and vital relations. In the last stage of the disease, the blood appears still more watery, owing chiefly to the deficiency of red globules: and the colourless globules more numerous than in health. The greater abundance of colourless globules is probably owing to impaired assimilation, or metamorphosis, of these into red globules. The colourless globules in this, and indeed in earlier stages of the disease, have been mistaken for pus globules, the existence of which in the circulation is doubtful, or at least not satisfactorily demonstrated. The vital crisis, as well as the size of the clot, progressively diminishes, and the coagulating power or force of the fibrine is much diminished. It does not appear that the *microscopic appearances* of the blood in phthisis are different from those now stated, or that the observations which have been made with the aid of this instrument have furnished any additional facts to those now adduced.

122. That the *vital crisis* of the blood is *especially altered* in tuberculosis and consequently in pulmonary consumption may be admitted; but in what the true nature of this alteration consists is beyond our present knowledge. We can only remark the appearances it displays, and the states of vital force and of assimilation and nutrition with which it is connected. That the tubercular deposits in the lungs or elsewhere, which certainly presents the feeblest traces of organisation, even in an early stage of their formation, if indeed they possess any whatever (for both opinions have been espoused), should consist of a modification of fibrine, as supposed by ROKITANSKY, requires further confirmation. He ascribes the formation of tubercles to an arterial elaboration of the fibrine, and contends that, in consequence of the alteration of the fibrine, tubercle is continually deposited, even when the blood is deficient in that constituent, the fibrine that is formed being soon affected by the peculiar dyscrasia and deposited in the form of tubercle. The rapid coagulation of the tubercle-blastema, or the fluid from which the tubercle is formed,—for it must be effused in

a fluid form,—its tendency, after coagulation and growth or accumulation, to soften, he believes to be favoured by an active arterialisation, and prevented by a venous condition of the blood—changes, which, in his opinion, indicate an affinity between tubercle and fibrine. This hypothesis derives its chief support from the circumstance that debility is found to increase the quantity of fibrine and also to favour tubercular formations; but it carries us no further in our knowledge than was previously admitted—than that the increased quantity of fibrine in the blood of scrofulous and phthisical persons, arising either from the imperfect assimilation, or from the waste of the blood-globules, or from the waste of the tissues, being imperfectly endowed by the vital force, owing to its low grade, is insufficiently elaborated and eliminated, and is deposited in the form of tubercle in situations favourable to its accumulation, where its imperfect vital endowment and elaboration favour the changes its subsequently manifests.

CHAP. VIII.

COMPLICATIONS OF TUBERCULAR PHTHISIS.

123. It is manifest that tubercles in the lungs, in their several states and stages, being the effects of originally deficient, or subsequently impaired, organic nervous or vital force, and of the consequent changes in the blood, should not be viewed as a special disease of the lungs, or as limited to these organs only, but as a malady, in which the constitution—the whole frame, is more or less implicated. The earlier changes of organic nervous power and of the circulating fluids being such as now stated, it may be inferred that numerous associated and consecutive alterations will appear at early and advanced stages of the malady, more or less intimately connected with the original mischief, or tubercular vice, either as associated or related changes or as more remote results. As these severally, and often in various associations, may be expected to present themselves in the course of phthisis, it becomes important that a brief view should be taken of them, as they are most frequently presented to us in actual practice, and nearly in the order as to frequency in which they occur.

It will appear from the foregoing, as well as from the cir-

cumstance of my not having taken particular notice of a form of phthisis, recently called *dyspeptic phthisis*,—a form which Dr. A. SMITH has shown above (*see note to § 114*) to have been first insisted on by TISSOT,—that I do not consider this as a variety of phthisis, inasmuch as digestion is, as noticed by Dr. SMITH, an early attendant upon all the forms of this malady, although in different grades; and even when dyspepsia may be so slight as to be overlooked, especially as regards the functions of the stomach, healthy assimilation and nutrition may be very remarkably impaired. Original or acquired defect of the digestive, assimilating, and nutritive functions is not only the attendant upon the commencement and progress of the several forms of phthisis, but it precedes their origins in more or less manifest grades. Indeed, the malady may rationally be viewed as presenting this procession of morbid phenomena, if we admit the earliest change from health in tubercular persons, whether hereditary or acquired, to be impaired function of the ganglial nervous system, or, in other words, defective organic nervous power—a power which endows and actuates the digestive, circulating, and nutritive organs and functions.

124. A. HÆMOPTYSIS.—I have already considered this occurrence not only *per se*, but as a most important symptom of phthisis (§§ 41, *et seq.*). It may also be viewed as a *complication* of this disease; and it may supervene upon tubercles of the lungs co-existing with either functional and congestive disorder, or with organic lesion, of the heart. Hæmoptysis may, however, be caused by congestion of, or impeded circulation through, the cavities of the heart, independently of the existence of tubercles in the lungs; but this occurrence is comparatively rare. The blood may proceed—1st, as a simple exudation from the bronchial mucous membrane, in consequence of the irritation and congestion caused by the tubercular deposits, whether within or without the air-cells and capillary bronchi, and by the impediment they occasion to the circulation in the pulmonary veins;—2ndly, from the surface of a cavity owing to the erosion of one or more of the vessels passing to it,—a circumstance of much more frequent occurrence than was formerly supposed;—3rdly, into the structure of the organ, without any previous cavity, little or even none of the blood being expectorated, asphyxia having been suddenly produced by the extravasation.

The hæmoptysis which takes place at the commencement or at an early stage of phthisis may generally be ascribed to the first of these pathological states; but it may also proceed from the disorders and lesions of the heart already alluded to (§ 59), either

independently of, or in connection with, tubercular deposits in the lungs. It should not, however, be overlooked that the hæmoptysis may appear in females as a vicarious menstruation: and as such it may be connected with tubercular deposits in the lungs or morbid states of the heart, or with both states of disease, or it may be independent of either of these. When the hæmoptysis takes place vicariously of menstruation, or even in consequence of interrupted circulation through the cavities of the heart, the lungs are very rarely free from tubercular formations. But in whatever mode hæmoptysis takes place, the blood, which remains for a time in the bronchi, from or into which it is effused, generally excites more or less irritation, often amounting to inflammation of the bronchial mucous surface, thereby further complicating the malady.

125. *B. BRONCHIAL IRRITATION AND INFLAMMATION.*—Bronchitis, most frequently limited, but either acute, sub-acute, or chronic, is a common complication of phthisis. It may exist in one or other of these states. It is generally confined to the bronchi in a portion of one or both lungs, and more especially to the bronchi in the vicinity of, or communicating with the seats of tubercular deposits or cavities. In the first stage of phthisis, these deposits most probably occasion merely a state of irritation, or of sub-inflammation, of the mucous membrane of the adjoining bronchi; but, even in this stage, when external agents, or other causes, aid the operation of this pathological condition, then a more active disease of this membrane is developed, especially if one or more attacks of hæmoptysis have occurred, and sub-acute or even acute bronchitis results. The effect of this bronchitis, although limited, as now stated, is to develop the crude tubercles and to hasten their softening. When this has taken place, and the softened tubercular matter has made its way into the adjoining bronchi, then a very obvious cause of irritation and of inflammatory action is superadded to those previously existing. Hence during, and subsequent to, the softening — during the second and third stages, the sputum becomes much more abundant, and its quantity is owing chiefly to the morbid secretion from the inflamed bronchi — unless, indeed, in those very rare cases, when the bronchi is not materially irritated by the disseminated tubercles, or when the softened matter is absorbed and does not pass off by the bronchi. In these stages, the discharge from the surface of the cavities, or the contents of recent tubercular vomicæ, are the chief causes of the bronchitis and of its perpetuation; for it is frequently observed, that the morbid appearances, both inflamma-

tory and ulcerative, exist chiefly in, or are limited to, the bronchi communicating with the vomicæ or cavities, and that these changes may be traced in, and from, these bronchi to their larger trunks, until the trachea is reached, where also, as well as in the larynx, the same alterations are not infrequently observed; whilst the bronchi which present not this communication, or which extend only to crude tubercles, are either exempt from these changes or present them in a slight degree. Dr. CARSWELL detected ulceration even in the minute bronchi communicating with cavities, showing the extension of the morbid action from the latter by means of the discharge from them. (*See BRONCHITIS.*)

126. *C.* INFLAMMATION, ULCERATION, ŒDEMA, &c., OF THE LARYNX AND TRACHEA are often complications in the course of phthisis. The frequency of this association depends upon the original, concurrent, and consecutive causes, and upon influences and agents acting in the course of the malady. The affection of these parts is to be imputed chiefly to the same changes as occasion the bronchitis—to the tubercular and other discharges from the originally diseased parts; and often the morbid appearances may be traced from the bronchi communicating with cavities to the trachea and larynx. In some cases, however, the affection of the larynx, and even of the epiglottis, commences previously to the softening of the tubercles, and may be ascribed in these to the greater susceptibility of these parts, in the early stages of phthisis, to the usual exciting causes of inflammation and its consequences, and to the irritation extending to them,—by sympathy and continuity from the pulmonary and digestive mucous surfaces. In the early, as well as in the advanced, stages of phthisis, the digestive mucous surface furnishes many indications of irritation, giving rise to heart-burn, acrid eructations, &c., which very sensibly affect the larynx and epiglottis, and kindle disorder, which is not readily, and even never, put out. That it may thus partly originate in the digestive organs, is shown by the circumstance of the lesions being sometimes either limited to the larynx and laryngeal surface of the epiglottis, or chiefly found in these parts, the trachea being comparatively exempt or nearly so. In other cases, both these and the trachea are affected more or less; and not infrequently the inflammatory changes, ulcerative, &c., are limited to the trachea, and found chiefly either in the posterior or membranous portion of the trachea, or towards the side of it corresponding with the cavities which exist chiefly or only in one lung. This limitation of the ulceration to one side of the trachea, very probably is caused

by the passage of the morbid secretion over it during the position of the patient in bed, which is most frequently on the back, or towards the side most diseased, so as to give greater freedom of respiration to the lung least affected. In some cases, the ulceration of the posterior part of the trachea is very extensive, and some of the ulcers very deep, even so much so as to give rise, in rare instances, to a fistulous opening into the œsophagus, one instance of which came under my observation. The larynx is rarely attacked primarily, or independently of tubercular deposits in the lungs; it is chiefly in connection with tubercular disease of the lungs and with syphilis that lesions of this part occur. M. LOUIS states that of 180 persons, who died of chronic diseases, not phthisical or syphilitic, he found one only with ulceration of the larynx; but that one in five had ulceration of this part or of the epiglottis; and one in three had ulceration of the trachea, among those who died of tubercular consumption.

127. *Inflammation* or ulceration of the larynx is an important complication of phthisis; and when the affection of these parts is severe, and that of the lungs not well developed, or at an early stage, the disease has often been called *laryngeal phthisis*. But, in those cases, the affection of the larynx is merely symptomatic of the tubercular formations in the lungs, which is often masked by the former affection, especially when it is severe or the tubercular deposits not far advanced. In this state of the larynx there is either hoarseness or loss of voice, with pain in the region of the os hyoides, especially when ulcerations have advanced. The cough is characterised by a harsh grating sound. It is difficult, suffocative, or attended by a whistling noise. The *ulcerations* in the trachea are very frequent in the more chronic states of phthisis, and are rarely manifested during life in these slow cases. M. LOUIS observed in some instances that sensations of heat and obstruction were complained of behind and above the sternum.

But as I have shown in another work (See *Dict. of Pract. Med.* vol. iii. pp. 687 *et seq.*), the rational symptoms of pulmonary consumption may be present, especially cough, puriform expectoration, streaked or dotted with blood, increased morning perspirations, emaciation, hectic fever, and impaired digestive assimilating and depurating functions, owing to chronic inflammation of the larynx and trachea, or to chronic bronchitis, the lungs themselves being altogether free from tubercular deposits. Such cases require a careful examination of the pharynx, larynx and trachea, as well as of the several regions of the thorax. Chronic bronchitis may also be mistaken for chronic

laryngitis or trachitis on the one hand, and for tubercular phthisis on the other. When the latter exists it may be associated with either of the former, the urgency and the severity of whose symptoms may mask the tubercular malady, especially when the voice and respiration are affected. But this subject will be treated more fully in a distinct part of this work. (See *Laryngeal Consumption*.)

128. *D. INFLAMMATIONS OF THE LUNGS, limited to portions of them, and both of these portions and of their bronchi*, especially to parts adjoining the tubercular masses, vomicæ and cavities, often occur at all stages of phthisis. In the first stage, when the tubercles are crude or disseminated through the organ, the inflammatory action may, from its grade, or its congestive or scrofulous character, or from being mashed by the tubercular deposits, be imperfectly manifested either by the rational symptoms or the physical signs. In this stage it is very difficult to determine whether the tubercles be the cause of the inflammatory irritation, or the latter the produce of the tubercles. It is not improbable that, however originating, the one morbid state acts, and is acted, on by the other. As the tubercles advance to softening, inflammatory or congestive appearances may be detected around them, and the same are often seen around the vomicæ or in or near the walls of cavities, the bronchi, both capillary and large, participating in these changes. In many instances the structure of the lungs is condensed or infiltrated with tubercular matter around cavities or vomicæ, the change being a result of inflammation of a scrofulous or congestive character, limited to the situations in which the tubercular deposits are, or have been, most abundant or developed. In other instances, especially at an early stage, the attacks of hæmoptysis, especially when considerable, diminish or subdue the inflammatory condition, and leave the portions of lung not yet disorganised in a better state than previously for the performance of their functions. In some cases, especially where the deposits or vomicæ are near the surface of a portion of lung, the inflammatory action in the adjoining structure extends to the pleura, giving origin to the next complication, namely, intercurrent *pleuritis*, which is very frequently associated with one or more of those already considered.

129. *E. INFLAMMATION OF THE PLEURA*—in an acute, sub-acute, or chronic form—most frequently limited, but sometimes very considerably extended—generally very sensibly expressed, but occasionally almost latent or not expressed, or rather overlooked during life, is a most common lesion in cases of tubercular consumption;

for it is very rarely found on dissection that the lungs in this disease are altogether free from old or recent adhesions. The pleuritic lesion usually arises from the extension of inflammation from the vicinity of the tubercular formations and cavities to the pleura, and is in most cases manifested by the pain commonly experienced, and if not by pain, by the physical signs. The inflammation of the portion of pleura covering tubercular deposits or vomicae agglutinates it, by the exudation of lymph, to the opposite or costal pleura, thereby preventing, unless in rare instances, the *perforation* of the pulmonary pleura, and the consequences which would follow. The lesions supervening in the pleura in the course of tubercular phthisis, and the contingent results which sometimes ensue, more especially *perforation of the pulmonary pleura*, are fully considered in my work on *Practical Medicine* under the heads PLEURA, *Inflammations of* (§§ 112, *et seq.*), and *Structural Lesions of* (§§ 201 *et seq.*), and PNEUMATOTHORAX, and to these I refer the reader for the further elucidation of these complications of phthisis.

130. *F.* SEVERAL ABDOMINAL COMPLICATIONS are manifested in the course of phthisis, and evince the general or constitutional nature of the malady—or the origin of it in the organic or ganglial nervous influence endowing the vascular system and the circulating fluids. These complications may appear at all stages of phthisis, or they may precede the first stage.—*a.* The complication with *disease of the digestive mucous surface* is one of the most important. The stomach, the lower parts of the ileum, and the cœcum and colon, are most frequently affected. M. ANDRAL justly remarks that “softening of the mucous membrane of the stomach, hyperæmia of the different portions of the intestines, ulceration of the small intestine, accompanied in many instances by a development of tubercles, are all of such frequent occurrence in phthisis, that they may fairly be considered as constituent parts of the disease.” These lesions of the digestive canal most frequently occur in the course of the pulmonary disease, often not until an advanced stage, especially in persons somewhat advanced in age; but they sometimes precede it, particularly in children, and younger subjects, and in some cases, the pulmonary and abdominal affections appear to commence at the same time or nearly so.

131. (*a.*) This is more especially the case as respects the complication with *disorder of the stomach*. At the commencement of phthisis this complication is usually of a dyspeptic character; but it may, as the disease advances, or even from the first, assume a severer form, and be attended by nausea, pain, or vomiting. Ten-

derness, a sense of heat or burning pain, increased by pressure, are present in these cases, and may arise either from inflammatory softening of the villous surface, or from ulceration. These symptoms and lesions, although early observed in some cases, the vomiting and pain occasionally being severe and obstinate, commonly appear in the second or third stages of phthisis—oftener in the third. As far as my experience extends, young females have more frequently presented this association than males. *Increased size of the stomach* was observed by M. LOUIS in more than two thirds of the cases examined by him after death, whilst only two instances of it were seen in 230 subjects who died of other diseases. In some cases the organ is double or treble its natural capacity, descending in these as low as nearly to reach the pelvis, its coats becoming thinner in the ratio of its increased size.

132. (b). *Disease of the intestines*, chiefly of the follicles of the lower portion of the ileum, commencing with tubercular deposits in the solitary and agminated follicles, and terminating in ulceration of these, is a very common complication of phthisis. The follicles are first distended, enlarged, and projected on the mucous surface by the tubercular deposit; they afterwards burst, discharge their contents, and ulcerate; the ulcers being seated chiefly in the patches of agminated follicles in the lower portion of the ileum, and in the side opposite to the attachment of the mesentery. In the large intestines, especially the cœcum, the ulcerations are disseminated irregularly. The small ulcers in the ileum generally coalesce, and the ulcers often pass under the mucous surface and detach portions of it. They often proceed deeply, as shown in the article on the DIGESTIVE MUCOUS SURFACE (§§ 36, *et seq.*), but they rarely perforate the intestines in phthisis, for as soon as they approach the peritoneal surface, lymph is thrown out on it, and the nearly perforated part is agglutinated to the opposite peritoneal surface. This lesion of the intestines is generally attended by the obstinate diarrhœa which occurs in the second and third stages of phthisis, in the latter especially, and has usually been termed *colliquative diarrhœa*. It is chiefly to be ascribed to two morbid conditions, or to either of them, namely to the existence of tubercles in the intestinal follicles, or to disease of these follicles excited by the morbid states of the blood, in the course of the elimination of the morbid elements from this fluid by these follicles.

The earlier the ulceration of the intestines takes place in phthisis, the more rapid in general is the progress of the malady, and the loss of flesh and strength of the patient. In the more

chronic and protracted cases, this lesion seldom supervenes until shortly before their fatal termination. M. LOUIS states, that he found tuberculous ulceration of the small intestines in five sixths of the cases he inspected; and almost as frequently in the large intestines; the mucous membrane being often red, thickened and softened in about one half of these cases. In the whole number of phthisical bodies examined by this physician, the large intestines were in a healthy state throughout their extent in three instances only. In the cases which I have inspected, I have always found the *cæcum* more or less ulcerated; and in some I had reason to infer that this portion of the canal was the first to be affected; perforation of the *cæcum* and pericæcal abscess or fistula having taken place in two cases in which I was consulted.

133. (c.) The *mesenteric glands* are often found tuberculous, especially in young subjects, and in connection with tubercular ulceration of the intestinal follicles. In the phthisis of very young children these glands are rarely exempt. PAPA VOINE says that he found this lesion in one half of the cases of phthisis in children. This proportion is less than I have remarked in this class of subjects. In adults, LOUIS found these glands tuberculous in one fourth only.

134. (d.) The *liver* is found remarkably changed in a very large proportion of phthisical cases. This change consists in the deposition of *fat* in its structure, this organ becoming enlarged, fawn-coloured, and of diminished consistence, in proportion to the amount of fatty degeneration. The fatty or oily nature of this change is at once shown by the scalpel on dividing the liver, or by pressing a portion of it on paper, or by subjecting it to heat. The organ is equally changed throughout, and with a rapidity nearly equal to that of the tubercular malady, with which this alteration is intimately connected, and upon which it is dependent. M. LOUIS states that of forty-nine cases of this degeneration, forty-seven occurred in tubercular phthisis; whilst of 230 subjects of other diseases, nine only presented this alteration of the liver, and seven of these had tubercles in the lungs. He further remarks, that it is independent of the patient's age, and of any known cause excepting the existence of tubercles; and that it is not attended by any evident symptom except enlargement, the functions of the organ not being disturbed. Sex appears to influence its occurrence, as of the forty-nine cases seen by LOUIS, only ten were males. The most remarkable instances of this alteration in connection with phthisis which I have seen, occurred in females addicted to the abuse of spirituous liquors. In

a young female who was thus addicted from childhood, who had never menstruated, and had died of phthisis about the age of nineteen, the fatty, fawn-coloured liver was so remarkably enlarged as to fill the abdomen, the lower edge of it pressing upon the bladder and pelvic viscera, the organ nearly equalling in weight the whole body. In these cases tubercles are rarely found in the liver, unless in children. From my own observation, and from a remark made by Sir J. CLARK, this change of the liver is not so frequently seen in phthisical subjects in this country as in France, yet functional disorder of this organ is often observed in the course of phthisis.

135. *G. Various other lesions* take place, especially in the advanced course of phthisis, but these are merely contingent occurrences, and seldom, or even rarely, met with. The most important of these are lesions of the heart, in rare cases, occasioning sudden death in the course of phthisis; obstruction of veins from coagula in their canals; hæmorrhoids and fistula in ano; tubercular and granular lesions of the urinary organs, and disease of the sexual organs. These require merely a few passing remarks. — *a. Softening and slight dilatation* of the ventricles is sometimes observed in the course of phthisis. In the case of a lady, death took place suddenly in the second stage of the chronic form. The body was examined in my presence, and the only apparent cause of the sudden dissolution was this sudden alteration of the heart. I have, however, seen this change in other cases of phthisis; but, although it may have accelerated the course of the malady, sudden death has not appeared to have been caused by it.

136. *b. Coagula in venous trunks*, especially in the extremities, form in rare cases at an advanced stage of phthisis, occasioning great œdematous swelling of the limb; and are the results of the morbid state of the blood, and of impeded circulation in the venous trunks rather than of inflammation of these vessels. The origin of these coagula in the passage of morbid matters into the circulation and the consequent coagulation of the blood, aided by remora and distressed vital force, has been noticed above (§§ 86.).

137. *c. Hæmorrhoids* are occasionally a complication of phthisis, and are produced as much by one of the most frequent causes of the latter, as by irritation of the rectum by frequent action of the bowels, and by interrupted or impeded circulation in the portal vessels, namely, by masturbation, which determines the circulation to the structures in the vicinity of the anus, and which, with one of its consequences, constipation of the bowels, favours congestion of the hæmorrhoidal veins.

138 *d. Fistula in Ano* sometimes occurs in the course of phthisis, more frequently in the early stages. It may be imputed to the same causes as produce hæmorrhoids. It has the effect of prolonging the duration, or to a certain extent arresting for some time, the progress of phthisis. Hæmorrhoids, when they discharge at intervals, have a similar effect to fistula in ano on the progress of the disease, as I have observed in several cases.

139. *e.* Alterations, more particularly tuberculosis, of the *urinary* and *sexual* organs, seldom supervene, in the course of phthisis, although the functions of these organs, especially of the uterine organs, are more or less disordered. Tubercular formations are sometimes formed beneath the mucous surface of the urinary passages in the phthisis of children. In female adults the catamenia are generally delayed, painful or suppressed in the advanced progress of the malady, which generally assumes a more severe and rapid form when suppression or retention of this discharge supervenes. In a case of a young lady, who died about the age of twenty of phthisis, and who had never menstruated, the body was inspected in my presence, and the ovaria were found very small, and their coverings thickened and almost of a fibro-cartilaginous density. The disease had been attributed by me to masturbation, the non-appearance of the catamenia, and the alterations of the ovaria, probably having been caused by this most noxious vice.

CHAP. IX.

APPEARANCES OBSERVED AFTER DEATH FROM PULMONARY CONSUMPTION.

140. ON opening the thorax after death from phthisis, the lungs generally do not collapse, or collapse imperfectly. They are more or less increased in weight, in some cases very remarkably. Dr. CLENDENNING found the average weight of the healthy lungs of an adult to be $46\frac{1}{2}$ ounces; and Dr. BOYD, as stated by Mr. ANCELL, ascertained that, in a considerable number of adult males, the average weight of tuberculated lungs was $72\frac{1}{2}$ ounces. The increase is due partly to the tubercular deposit, and partly, in various degrees, by an increased quantity of blood in the vessels, the

secretion of tuberculous pus, serous effusion, red or grey hepatisation of the lung, or extravasation of blood."

In the early stage of uncomplicated phthisis, when the tubercles are distinct, the pulmonary tissue is crepitant around them, and those which are most superficial somewhat raise the pleura. Distinct tubercles in the lungs, according to HASSE, are never larger than hemp seeds; when they are described as larger, a congeries must be understood. *Grey* and *yellow* crude miliary tubercles seldom co-exist in the same lung, unless they are deposited at distinct periods. (See on SCROFULA and TUBERCLES, §§ 65—90, in *Dict. of Pract. Med.* vol. iii. pp. 744—6.

141. i. *Appearances of Tubercle under the Microscope.*—When treating of scrofula and tubercles in another work (See *Dict. of Pract. Med.* vol. iii. pp. 747), I have stated the results of the microscopic researches and opinions of CANSTATT, VOGEL, SCHARLAN, CERUTH, GUBY, GULLIVER, LEBERT, HUGHES, BENNETT, DALRYMPLE, and others, as to the organisation, growth, and destruction of tubercular formations,—and subsequently I have endeavoured, by independent observations, to ascertain the appearances of these formations. In their crude and unsoftened state, tubercles appear, under the highest magnifying power, to consist of—1st. Granular corpuscles of an irregular and angular form. 2nd. The interiors of these corpuscles are of a yellowish hue, slightly opaline, sometimes with molecular granules distributed through their substance, but they present no true nuclei, as commonly seen in cancerous corpuscles, and so constantly in those of pus. 3rd. These granular corpuscles often present a concentric or superimposed layer, in which the following are more or less mixed. 4th. Epithelial scales variously altered, especially in tubercles in the lungs. 5th. Cells and portions of disorganised tissue belonging to the old structure. 6th. Crystals of salts; and 7th. Fat or oil globules.

ROKITANSKY, conformably with his views of the nature of tubercle, regards the *grey* form as simply fibrinous, or that most nearly allied to the constituent of the blood of which he believes tubercle to be a modification, and the *yellow* form, which he calls the croupo-fibrinous as that to which softening is generally limited. The *grey tubercle*, according to him, undergoes only a horn-like change—a state of *obsolescence*, but it is occasionally the seat of yellow tuberculous matter which is deposited or mixed with it; and when it undergoes softening this change is owing to this yellowish matter. The *yellow tubercle* undergoes—1st. *Cretification*, which consists in the gradual deposition of calcareous particles in the tuberculous

mass and in the simultaneous absorption of the animal matter, thus forming a hard irregular substance, surrounded by indurated tissue. 2nd. Softening when the texture of the tubercle becomes more and more moist and lax, until it ultimately breaks up, from a cheesy mass into a yellowish, diffuent, and thin flocculent fluid, having an acid reaction. Softened tubercle under the microscope appears to consist—1st. Of a fluid containing granular matter diffused in it; 2nd. Of altered cells and corpuscles; 3rd. Of the debris of tissues and oil-globules. The *grey* tubercle, according to ROKITANSKY, closely resembles fibrin in its tendency to shrink up into an indurated mass; the *yellow*, like the croupous fibrin of coagula and exudations, to soften and break up into a liquid substance, the softening commencing in the centre. The softening is undoubtedly aided by increased vascularity and vascular action in the surrounding tissue.

142. ii. *The chemical Constitution of Pulmonary Tubercles.*—Chemical analysis has thrown little light on the *nature of tubercles*, or the mode of their formation. A tubercular mass analysed by PREUSS contained 19.5 of solid constituents and 80.5 of water; the former consisted of a substance resembling *casein*, in its relations to acetic acid and heat, a fatty matter containing cholestrin and a small quantity of salts. SCHERER states that crude pulmonary tubercle yielded little fat or extractive matter, indicating that the morbid process was not far advanced. An ultimate analysis, after the careful removal of salts and foreign matters, gave:

Carbon . . .	53.888	} which corresponds with the formula $C^{48}H^{36}N^6O^{14}$.
Hydrogen . . .	7.112	
Nitrogen . . .	17.237	
Oxygen . . .	21.767	

Hence tubercle in its crude state may be regarded as *protein* ($C^{48}H^{36}N^6O^{14}$) from which five atoms of carbon one of hydrogen and one of oxygen has been removed. SCHERER has made several other analyses of tubercles from other parts of the body; but they differ as little as, and sometimes less than, the above from the composition of protein.

The analysis of tubercles from the lungs, from the bronchi, and from the neck, has also been made by GUETERBOCK, and he states that they contain—1st. Albumen in small quantity; 2nd. Pyine, differing from casein; 3rd. Phymatine, a species of osmazome, which, according to him, is proper to tubercles, and which is soluble in water and in alcohol, is precipitated by the acetate of

lead, but not by galls, nor by the solution of the sulphate of copper; 4th. Fatty matter, not only cholestrin, but also saponifiable fat. As to phymatine, a principle which GUETERBOCK says is proper to tubercles; its existence requires to be proved by other analyses. Tubercular matter has been chemically examined also by BOUDET, HECHT and others, but the analyses of PREUSS and SCHERER appears to be the most satisfactory, and to them M. LEBERT also has given the preference.

143. iii. *The seats of the tubercles in the lungs* are somewhat different in adult and young subjects. In adults tubercular deposits are chiefly aggregated in the upper lobes. Miliary tubercles are most abundant in the posterior parts of the lungs, and through the parenchyma at some distance from the pleura, but there are many exceptions to this distribution. In children the whole lung, or large portions of both lungs, are the seats of deposits, which have appeared to have taken place about the same time. CARSWELL attributed the earlier and the more abundant formation of tubercles in the apices of the lungs, to the motion of these parts being more limited than those of the lower lobes. The former also are more exposed to the influence of cold externally, and are more accessible to the air, in its varying state of temperature and humidity. LOUIS, ANDRAL, and others consider that tubercles are more frequent in the left than in the right lung. HASSE, however, disputes this, but I believe with insufficient reasons. The question as to the tubercular deposit being *within* the air-cells, or *external* to them, or in other words in the parenchyma of the organ, is still disputed. MAJENDIE, CARSWELL, SCHRODER VAN DER KOLK, and RAINEY contend for the former; whilst ANDRAL, ANCELL, and others consider that tubercles may occur in either of these situations, and in any tissue where nutrition or secretion takes place. According to Mr. RAINEY, the earliest indications of tubercles in the lungs are deposits of a transparent or greyish, or yellowish substance in the air-cells, sometimes completely filling and distending them; the minute blood-vessels of the parietes of the cells surrounding the deposits being still perceptible. The deposits sometimes occur in a few only of the cells, but more frequently they fill all the cells of one lobule; and in this case they press upon these vessels, which soon disappear, the whole lobule appearing, after a while, entirely formed of tubercular matter. Tubercles in the lungs thus, according to CARSWELL, originally assume the shape of the air-cells, and are somewhat acuminate in proportion to their projection into the bronchial tubes. When they have been of slow growth, or are

- deposited in large groups, and occupy numerous cells of a lobule, they resemble the sprout of a cauliflower, the pedicle occasionally extending far into the bronchial tube. In the lungs of ruminating animals, tubercular matter is often seen plugging up the bronchial tubes. As the tubercle increases in size, the central parts become further removed from the vessels by which this matter is deposited: and consequently these parts have the greatest tendency to lose their vital cohesion, and they consequently are softened; this process generally beginning at or near the centre of the tubercle.

144. iv. *The distribution of tubercles in the lungs* varies much with the age of the patient and the form of the malady. In adults, in the usual and more chronic forms, the tubercular deposit commences, although in different amounts, generally in the apices of both lungs, and descends gradually downwards to the lower lobes; the larger and older cavities existing at the apices, smaller ones lower down; and accumulations of softened or crude tubercles, or of both, at the base. This cannot, however, be viewed as an absolute law. The tubercles also in one lung, as the left, may be generally further advanced in all their stages than those of the right. Besides one portion of a lung may be the seat of cavities or softened tubercles, all the rest, or the greater portion, of the lung being quite sound. Tubercles which are formed rapidly, are generally miliary and nearly equally dispersed through the lungs. In the more acute states of phthisis they are thus deposited, or are infiltrated more or less extensively or densely.

145. v. *Lesions of the lungs associated with tubercles.* — A. *Pneumonia*, or inflammation of portions of the lungs, and its usual consecutive changes, are often found associated with the several stages of tubercles. The inflammation may have passed on to red or grey hepatisation; and it may have preceded the tubercular deposits, or may have been consequent upon them, induced by the usual causes of pneumonia; or it may have been produced by the irritation developed and kept up by these deposits. It should not be overlooked, that the changes taking place in the lungs of scrofulous subjects during inflammatory action, may be attended by tubercular formations. Yet this may not necessarily be the case; and these formations may exist in the lungs even of scrofulous and sanguineous temperaments without inflammatory action in the lungs being produced by them; this action being chiefly a contingent or intercurrent result of causes unconnected with the tubercular disease.

146. a. According to LOUIS, GRISOLLE, HASSE, ANCELL, and others,

inflammation primarily attacking the scrofulous subject, may produce an exudation of lymph differing from the exudation occurring in pneumonia affecting the healthy person, chiefly in its tuberculous characters, and the disease may run its course, and the exudation may be absorbed: but as frequently, perhaps, the pneumonia of scrofulous subjects is followed by tubercular deposits and their usual consequences. ROKITANSKY calls this latter change hepatisation with tuberculous deposit, which, not being absorbed or becoming purulent, ultimately passes into yellow tubercle. According to HASSE this alteration is found more frequently in males than in females, and in persons from 18 to 25 years of age than earlier or later in life.

The alterations produced by *consecutive* or *incurrent inflammation* of portions of the lungs during the progress of phthisis is manifestly much more frequent than the primary form. LOUIS states that he observed the results of the first stage of inflammation, commonly occupying a limited space of the lungs in 23 out of 123 cases, and the stage of red hepatisation, generally in the lower lobe, in 18 cases. He regards the invasion of pneumonia in these cases as preceding death only a few days, and not peculiar to phthisis, as he observed it as frequently in deaths from other chronic maladies. Although the patient may die of pulmonary tubercles without any inflammatory appearances, yet the tubercles are very liable to irritate and inflame the surrounding tissues, and to render the patient more susceptible of the operation of the usual exciting causes of inflammation.

147. *b.* This secondary pneumonia generally assumes the *lobular* or *vesicular form*, and seldom appears until the tubercles have been developed, or have formed aggregated masses, and occasioned irritation in the surrounding structure. The matter exuded by this state of inflammatory action around the individual tubercles or masses, is generally peculiar, scrofulous and gelatinous; the spaces between being healthy. Sometimes, however, the inflammatory changes are not limited to the patches around tubercles, but extend to the vesicular structure of an entire lobule, and pass on to red or grey hepatisation, or even assume in parts a yellowish colour; the pulmonary structure being quite impermeable to air, firm and friable, the tubercles contained in it being more or less softened. In this state of the disease, the associated or intercurrent inflammation presents the usual scrofulous characters, modified by the peculiar structure and antecedent tubercular deposit.

148. *c.* The alterations found after death from the *acute form* of

phthisis (§§ 98, 101) present many of the appearances consequent upon inflammation of an acute form, in the scrofulous diathesis, associated with tubercular deposits, either antecedent to, or coeval with, the inflammatory action. As in other cases of inflammation in cachectic or unhealthy constitutions, the changes produced by it are peculiar, being diffused, œdematous, and marked by loss of the usual vital cohesion of the tissues. HASSE has well described the appearances in these acute cases. He states that one or both lungs are diseased. I have always found both lungs remarkably affected, although not to an equal amount or extent. In very marked cases, the lungs from their apices to their bases are loaded with isolated miliary tubercles, mostly yellowish and soft, but sometimes greyish and more solid. The yellow and soft tubercles are in the centres of red or grey hepatised structures; while the grey are imbedded in a texture loaded with a bloody serum. The lungs are tumefied, do not collapse when the chest is opened, are very dark coloured throughout, preternaturally soft, and gorged by dark fluid blood and serum. The tubercles have everywhere the same appearance; the pulmonary structure around them, for about a line, is more or less altered, the intervening structure being still permeable. The bronchial mucous surface is either dark-red or violet. Recent adhesions between the surfaces of the pleura are not seen. If adhesions exist, they have been formed previously to this disease. When the malady has been slower in its progress, the tubercles are more united into groups, or are more densely crowded at the apices and superior lobes, than in the lower lobes.

149. *d.* In the more *chronic and usual forms* of *phthisis*, the alterations often associated with the tubercular deposits are those which are clearly attributable to chronic inflammatory action, and consist of hepatisation of a red or grey colour, or of varieties of hue of which these are original types. The parts thus altered are dense, impermeable to air; the bronchi are filled with a dense whitish matter, and the natural structure cannot be traced, the part being firm, but friable, or readily torn. The cut surface is speckled with grey inclining to yellow, is diversified with white stripes and arborescent black patches, and is devoid of the granulations of acute pneumonia. The incision is not followed by any exudation, and pressure yields only a little turbid greyish fluid. The inferior lobe of one or both lungs is thus chiefly affected; the alteration proceeding upwards and meeting the tubercular deposits as they advance downwards. According to HASSE, this associated inflammatory alteration, which differs from the effect of common pneumonia in

the induration of the lung, invades the lower portion of one lung only, whilst the tubercular deposits exist in both.

150. *B. Extravasation of blood* in tuberculated lungs is met with in either a fluid or clotted state : — 1st. It may occur as a simple exudation from the bronchial mucous surface ; — 2nd. It may proceed from ulceration of the bronchi ; — 3rd. Blood may be infiltrated into the parenchyma of the lungs in connection with congestive pneumonia complicating tubercles ; — 4th. It may be infiltrated not only into the parenchyma, but also into the air-cells ; — 5th. It may be effused from a laceration of the structure of the lung ; — 6th. It may be effused from the ulceration of a number of capillaries in the parietes of a cavity, or of one large vessel ; — and 7th., It may proceed from the rupture of a cavernous band, or of a vessel or vessels in such band. In most of these the blood is found either in a frothy or fluid state in the trachea and bronchi, or partially coagulated ; and coagula are contained in cavities, and sometimes in the bronchial tubes. In these several forms, excepting the two last, the effused blood may become the seats of tubercles. Extravasation of blood is met with in all stages of tubercular phthisis. According to HASSE, it is found chiefly where tubercles have been rapidly formed in connection with inflammatory action, or when the lungs are replete with densely clustered tubercles. CARSWELL considers, that the sanguineous effusion is in many cases owing to the compression of the pulmonary veins by the tubercular masses, and to the consequent prevention of the return of the whole of the blood sent to the organ. Both of these explanations may be correct as respects different cases. When blood is effused into the cellular tissue of the lungs, so as to constitute pulmonary apoplexy ; or, in one or more of these forms, obstructed circulation through the heart may originate the effusion, although the connection of tubercular phthisis with obstructive cardiac disease is comparatively rare.

151. *C. Œdematous infiltration* of the lung is sometimes seen, but generally only to a small extent ; and chiefly in the acute form of the disease, in the more cachectic and phlegmatic habits ; or when phthisis is complicated with disease of the bronchial glands, or of the kidneys. RILLIET and BARTHEZ consider that serous congestion or œdema of the lungs is sometimes connected with the deposit of tubercles in children ; that it may be produced by this deposit ; but that it most frequently depends upon compression of the vessels by enlargement of the bronchial glands.

152. *D. Emphysema.*—Vesicular emphysema is frequently found

in tuberculated lungs, in chronic cases, in connection with various other lesions, chiefly in the superior and anterior parts of the organ. It occurs at an early stage, generally in a diffused form, and is produced by the pressure of disseminated tubercles upon the minute bronchi; the more powerful act of inspiration filling the cells, whilst the less powerful expiration fails in emptying them. Emphysematous portions of the lungs rarely contain tubercles. But this alteration is seldom found to a great extent, and generally in cases where it had not been detected by the physical signs: "it is usually seen in the upper parts of the lungs, and often in conjunction with cicatrised and collapsed portions. The healing process, by absorption of the more liquid parts of tubercles and of tubercular vomicae, by shrivelling the remainder, by cicatrisation of the ulcers, and obliteration of blood-vessels and bronchial tubes," produces a vacancy in the space within the thorax, and this space is gradually, or more or less, filled up by the sinking inwards of the walls of the chest, and by the dilatation of the air-cells in the adjoining still permeable portions of the lung; this latter result sometimes preventing the occurrence of the falling inwards of the parietes of the thorax.

153. vi. *Softened or liquified tubercles.*—It is not improbable that the process of softening may not be limited to one only of the modes contended for by pathologists, but that when it commences or proceeds in the centres of the tubercles, it may also be advancing in their circumferences, owing to the irritation produced by them, and to the fluid effused from the irritated tissues surrounding them; the softening thus advancing from the centre to the periphery, and from the latter to the former of the tubercle. Generally it is found, that softening of tubercular deposits first takes place, conformably with the progress of the deposits, in those nearest the summits of the lungs, and proceeds downwards. With the process of softening, the pulmonary tissues surrounding the tubercles become more vascular, and inflammatory or congestive changes take place, extending more or less in the parenchyma, and ultimately to the pleura. The results of the softening are, discharge of the liquified matter into the bronchi communicating with these tubercles, and the formation of a cavity, which enlarges by successive tuberculation and softening, by continued discharge, and by the coalition of two or more softened tubercles and small cavities.

Softening and liquefaction of tubercles are accelerated by increased vascularity, with serous effusion in the surrounding tissues;

but the tendency to softening is probably proportioned to the extent of the tuberculous deposit and to the diminution of vital crisis of the blood, and of the vital cohesion of the tissues. Where these are great, the softening will go on rapidly, and a cavity be speedily formed; but where the vital forces manifested by the blood and tissues are less impaired, or are improved by proper treatment, there will then be an exudation of fibrinous lymph indurating the enveloping tissue, or forming a wall to and contracting the cavity, if one has already formed, and favouring cicatrisation. When the tubercles liquify in the second stage of the malady, they generally are discharged, at least partially, by the bronchi. But the softened tubercles, when they exist in masses, form vomicæ, which are partially or altogether evacuated by the bronchi, or the contents; or softened tubercular matters are more or less absorbed, thereby rendering the constitutional symptoms more severe, and the malady more rapidly fatal.

154. vii. *Tubercular Cavities and Vomicae*.—A. Tubercular vomicae, as Mr. ANCELL justly states, are either,—1st, pulmonary,—2nd, pleuro-pulmonary,—3rd, broncho-pulmonary, or—4th, broncho-pleura-pulmonary, according to their connections with the principal structures of the lungs. The most frequent *seat* of vomicae and cavities is the summit of the superior lobes of the lungs. They are sometimes seen only on one side, tubercles on the other side being still crude or softening; but when the disease is of long duration they have formed on both sides. When they are found in the lower lobes, or at the base of the lung, they are generally more numerous, larger and older in the summit. Proceeding from above downwards, the following grades or succession of tubercular alterations are observed:—1st, old cavities, with firm or almost smooth parietes, generally empty:—2nd, more recent cavities with tuberculous deposits in their walls, or softened irregular parietes, containing matters about to be noticed:—3rd, softened tubercles, either isolated or aggregated:—4th, crude tubercles:—5th, semi-transparent grey granulations; and, —6th, healthy crepitant lung. This succession arises from the progressive development of the tubercular deposit from the summit to the base. The cavities are generally seated deep in the lung, but in some cases they are superficial or near to the pleura. In the former case they commonly open into the bronchi; in the latter, they are disposed to perforate the pleura, but are prevented by the adhesions formed by this membrane. Large excavations are usually seated nearer to the posterior than to the anterior surface of the

lungs, where they extend to the interlobular fissure, and even sometimes communicate with other cavities in the lobe below.

155. *B. The dimensions and form* of the cavities vary much. Their size varies from that of a pea to that of a large orange; small cavities are generally spherical or oval, but as they enlarge, their form is more irregular, owing to the softening and disorganisation of the parietes having proceeded more rapidly in one direction than in another. Where several large cavities communicate, one unequal and sinuous excavation is formed, sometimes with fistulous tracts, and is very irregular in shape, direction, and size, but terminating in one or more ulcerated bronchi. The *number* of cavities is often considerable, the largest frequently arising from the union of several small ones. A single excavation is comparatively seldom met with. A cavity is surrounded by crude miliary tubercles, with very rare exceptions.

156. *C. The contents* of excavations may be air; or viscid, purulent, or sanious fluids, containing whitish, curdy, tubercular matter, more or less softened; or purulent secretions of a dirty greyish, or yellowish, or yellowish-green colour, sometimes streaked, tinged or mixed with blood; or blood more or less pure, fluid or coagulated. The fluid puriform contents are sometimes foetid, owing to their long retention, a communication with a bronchus not having been formed. Old cavities are often empty; recent ones frequently contain purulent or sanious matters, and the softened remains of tubercles. These matters are thus the secretion from the parietes of the cavity, and the débris of tubercles and of the surrounding tissues, altered more or less by retention in the cavities or by the action of the air. Fragments of the pulmonary structure are seldom found in the excavation, but when seen they are more frequently attached to, than detached from, the parietes. Bridles or chords are occasionally found stretching across a large cavity: these consist of *blood-vessels*, whose coats had become inflamed and thickened, their contents coagulated, and, having resisted the disorganising process of the adjoining tissues, had been reduced to chords.

HASSE describes the blood-vessels forming bands across cavities as often having their coats reduced to a single, uniform, lardaceous substance; and their canals, which still continue, although narrowed, becoming eventually filled with a thin, reddish, fibrinous plug. The bands, or cords, thus formed by the blood-vessels are, in rare cases, either partially destroyed or torn asunder, before their canals are completely closed: and thus the more violent attacks of

hæmorrhage ensue, and often prove fatal, the cavity and bronchi corresponding being found full of coagulated blood, and which also often fills, in a frothy state, the trachea. The *bronchi* are early destroyed; but, even when completely ulcerated, they often do not admit air into the cavity, nor the exit of the matters contained in a cavity; for they are plugged by lymph formed within the parts nearest the cavity, or by tubercular matter or deposits formed within them. The bronchi are not found in these bridles, which are thinner in their middles than at their extremities, the former having been longer exposed to the morbid processes.

157. *D. The Parietes of Cavities*, when recent, are merely the pulmonary tissues somewhat condensed by exuded lymph, or infiltrated with a greyish matter, or with grey granulations and crude tubercles. They are very rarely smooth, and formed only of the condensed pulmonary texture. In rare cases they are coloured by a brownish or blackish melanotic deposit. External to these parietes, which may not extend above a line or two into the pulmonary structure, the parts immediately surrounding them are healthy and crepitant. Somewhat older cavities are lined with a slightly adherent and soft false membrane. This lining is friable, white or yellowish, resembles concrete pus, and has no vascular connection with the surrounding tissues. It seems as a deposit on the surface of the cavity from the matters therein contained. In still older cavities, external to this deposit, a membranous, organised layer, of a greyish fibro-cellular substance is formed, and is closely adherent to the pulmonary structure. This constitutes the true cyst or parietes of the cavity. This capsule becomes after a time more organised, and, from fibro-cellular, it is fibro-serous, semi-transparent, and in patches, or more extensively fibro-cartilaginous, unless where bronchi pass into the cavity. These latter changes are observed only in very old cavities; and vary in colour, vascularity, density, and appearance, with their duration. The internal surface of these parietes or capsules no longer presents the concrete matter first deposited, and forming the early false membrane, but appears, at a much later period, smooth or velvety, and of a pearl-grey, pinkish, or reddish hue.

158. *E. The discharge or the absorption of the contents of vomicæ* are matters of interest. The *discharge* takes place by means of the bronchi, which are destroyed in the seats of vomicæ, and which become irritated, inflamed, and ulcerated by the matters formed and passed along them; the discharge from the bronchi, communicating with cavities, being often greater than that pro-

ceeding from the latter. When the matters contained in vomicae are long retained without having communicated with bronchi, they often become very offensive and irritating to the bronchi and trachea during their discharge, and occasion the inflammatory appearances observed in these parts.

159. *F.* The *absorption* of the contents of cavities into the circulation may be inferred when they are found empty, without any manifest communication with bronchi, — when this cannot be detected upon dissection, and when the history of the case furnishes no proof of the discharge of these contents during life. I have already alluded to instances of acute phthisis which terminated fatally without expectoration and cough, but preceded by the typhoid symptoms characterising contamination of the blood by the absorption of morbid matters; and in those the cavities, generally small, were empty, their parietes being soft, or covered by a semi-concrete puriform substance.

160. *G.* The *healing processes presented by tubercles of the lungs* have been described by ROGET, BOUDET, LAURENCE, BAYLE, BENNETT, ANCELL, and others. HASSE conceives that the cicatrization of tubercles cannot take place if the amount of tubercular deposit be considerable or great; and if the softening be, as it usually is, attended by the continual formation of tubercles. The degree, or the procection, of morbid change in the lungs admitting of remedy cannot be defined, even if both were objects of precise observation. The states of organic nervous power and of the circulating fluids should be viewed as the chief sources, from which the local lesions are to derive reparation. And this end can be attained only by supporting this power, by enabling it to improve the digestive and assimilating processes, and thereby rendering the circulating fluid more vitalised, and less capable of forming or perpetuating the tubercular deposits. Under the influence of this system, and of the improved condition of the blood, morbid products are more sparingly formed; those which are formed have their more fluid parts absorbed; they are consequently atrophied, and their more solid, earthy, or saline parts, as respects tubercles especially, alone remain, either in a passive or inert state, and are increased by subsequent depositions, or exist in such condition as gradually advances their discharge. This is the course usually pursued in the removal of tubercular deposits before cavities are formed, and has thus been termed the process of *cretification*. (§§ 161, 162.)

161. *a.* As regards *the formation of these concretions* it may be

inferred that the organic elements of tubercle are absorbed, and carbonate and phosphate of lime deposited in their place; so that the concretions cannot be viewed as the mere solid remains of the pre-existing tubercles. HASSE remarks that the calcareous deposit, in some cases, especially in young subjects, takes place somewhat rapidly, the outside of the tubercle being then changed into a hard crust, while the central part retains its softness. Occasionally the calcareous matter appears to have been deposited at intervals, producing a series of hard, distinct super-imposed strata. Most frequently when the process advances slowly, the tubercles appear like to moist chalk. Thus the volume of the entire mass continues to diminish, so much so that a considerable portion of lung, as may be inferred from the size of the bronchi leading to it, becomes reduced by obliteration and shrivelling, to a hard shell, holding in its centre a chalky tubercle no bigger than a pea. This healing process is by no means rare, its traces being often found in the lungs of very aged persons who have died of different maladies, and not unfrequently also in much younger subjects.

162. *b. Tubercular cavities heal* in the same manner, whether they are connected with several bronchi, or shut out from the air-passages. In the latter case exactly the same capsule, resulting from inflammatory induration of the surrounding structure, is found, wherein the enclosed tubercular mass is converted first into a chalky pulp, and ultimately into a *hard calcareous concretion*. The majority of these concretions originate in the small and still closed cavities. They are irregularly shaped, with a granular rough surface, are hard or friable, and often contain mealy or soft nuclei. They are found most frequently at the summits of the upper and of the lower lobes, firmly impacted within a shrivelled and condensed structure. "In rare instances the residue of tubercular matter, left within the larger cicatrised cavities, is by degrees converted into earthy granules. These are loosely held within the scar-contracted cavity, where they mingle with tubercular and muco-purulent fluids, and may become ejected during a violent fit of cough, provided the implicated bronchial tubes still remain open."—(HASSE, &c., p. 340.)

163. *c. Cavities cicatrise* in different ways; but generally as stated above (§§ 160 *et seq.*). They may disappear altogether, or contract only to a limited extent. In the former case they are united and filled by a cellulo-fibrous substance. In this case the membranous lining or paries of the cavity becomes thickened by a

deposition of plastic exudation or lymph, either upon its external or internal surface, most probably upon the former. The membrane thus grows and contracts towards the centre, until the cavity is filled with a fibro-cellular substance. The gradual obliteration of the cavity is further effected by the condition of the adjoining parts. If the vomica be near the surface of the lung, the pleura becomes much thickened, and the walls of the thorax sink inwards, so as to favour the shrivelling process. The corresponding bronchi are closed, and the healing of the cavity is effected, the remaining scar being either thick, or roundish, or elongated.

When the cavities contract only to a limited extent, and simply lose their original characters, their walls are moulded out of the aforesaid layer of shrivelled parenchyma, which now neither contains nor secretes tubercular matter. "These extinct vomicae are frequently seen at the apex of the lungs, and might readily be taken for mere bronchial dilatations, were their real nature not disclosed by the relations of the surrounding pulmonary texture, by the co-existence of cretaceous masses, and above all, by the character of the membranous lining, which essentially differs from, and does not immediately unite with, the mucous coat of the bronchial tubes." This internal lining usually adheres firmly to the indurated walls of the cavity, and is either thick, reddened, and velvety, or pale, smooth, and thin.

The state of the pulmonary structure, both adjacent and more remote, is influenced by the above healing process; and the consequent changes are well described by HASSE. The inflammatory exudation upon which the above alterations depend, often involves the whole of the apex, if not the entire upper lobe of the lung, while the collective bronchial tubes degenerate into white, thread-like ramifications. The involved parenchyma of the lung is now converted into an almost cartilaginous mass, impervious to the air, very scantily supplied with blood-vessels, and presenting, when cut, a smooth glistening surface. Obliterated pulmonary vessels, closed bronchi, cicatrices, and parenchyma infiltrated with plastic materials, are hardly to be distinguished from each other; and the whole adheres firmly, by means of the thickened semi-cartilaginous pleura, to the sunken walls of the chest. A few cretaceous tubercles are still found scattered throughout the hard, nearly homogeneous mass, which, below, merges sometimes gradually, but more often suddenly, into the healthy texture.

164. *d.* The deposition of *black pigment* into the lungs during the healing process is a very remarkable fact. It is found wanting

only, or almost wanting, in the rare instances of the repair of tubercular disease by means of calcareous deposits in youthful subjects. In older persons the black pigment is so constant, and so considerable that it might be doubtful whether it be the cause, or the sequel, of the cure of phthisis. "Not alone the parts closely adjoining calcareous tubercles and cicatrised cavities, but, in like manner, the entire mass of those extensive indurations of the upper lobe, just described, are found densely loaded with this pigment. Even the most chalk-like residue of tubercular masses is often so imbued, as to exhibit a slate-grey or a bluish black tinge." In other cases, where tubercles are more limited, and in young persons, the pulmonary structure is puckered, without induration or extensive obliteration; the cicatrices appearing elongated, the cretaceous residue as isolated granules, and the black pigment uniformly but less densely disseminated in the interstices of the air-cells. The cicatrices are surrounded by emphysema and dilated bronchi, and the thorax is seldom found depressed.

165. *e.* From the above description, it may be inferred, that tubercles in the lungs may be *arrested* in their course, and that the progress of certain of the local consequences of these formations may also be interrupted, delayed, or even altogether arrested. The modes in which these results are produced are described already; but it may be stated, that the *post mortem* inspection of all who die more or less advanced in age, present appearances in the lungs of a large proportion of them, indicating an arrest of the course of tubercular formation, and of its local consequences. That this proportion is much greater than is generally supposed is undoubted: but the amount or ratio of such appearances must necessarily depend, 1st., upon the climate, and the prevalence of consumption in that climate, and 2nd., upon the ages of the persons whose lungs are inspected, for in climates where pulmonary consumption is prevalent, even in a moderate rate, the proportion in which an arrest of the tubercular alterations occurs, will be greater as age is advanced. The proportion has been stated to be as high as a *third*, or even a fourth part of all who die above sixteen years of age; and even as high as one half of those who are above seventy years; but I believe these last proportions to be much too high.

166. *H.* In *children* the lungs are less the predominant seat of tubercles than other parts, especially the mesenteric and lymphatic glands and the bones. When deposited in the former in excess the tubercles pass through their stages rapidly. In very young children the pulmonary deposits are often latent, death ensuing from

the co-existence or supervention of disease of other parts. In those subjects who have died of other maladies, the lungs contain greyish, transparent semi-fluid granules or tubercles, not confined to the apex, but existing equally in the lower lobes. The bronchial glands are at the same time very tuberculous. BILLARD met with five instances of tubercles of the lungs in new-born children; HUSSON and KENNEDY in the foetus. I have seen the disease in the lungs of several infants of the age of a few months only. The disease in young children is generally acute, and it usually is of this form up to the age of seven or eight years. In young children the tubercular deposits may be as great or even greater in the bronchial, mesenteric, and cervical glands; in the liver, spleen, brain and its membranes, and kidneys, as in the lungs.

167. *I.* The tubercular and other lesions, found in the several organs of *adults* dead of pthisis, are often very numerous. Many of them have been already described when noticing the *complications* and intercurrent affections of the disease (§§ 123, *et seq.*). In the advanced stages, pleural inflammations occur, productive of every variety of false membrane, of adhesions, of miliary tubercles upon the pleura, and within the exudations on its surface, and of turbid, reddish, serous or purulent effusion. When the trachea and larynx are affected, as described above (§ 126.), as well in many other cases, the bronchial glands of the neck and those seated along the trachea are similarly affected, and exhibit all the phases of tubercular disease. The heart is quite devoid of fat in most cases. GLUGE states that he always found the blood within the larger veins and the heart in pthisis to contain pus-globules, to which circumstance, much of the constitutional symptoms may be referred. LOUIS and BIZOT have remarked that the aorta is always more or less contracted. The alterations of the liver and alimentary canal are always remarkable, and described above (§§ 130—135.).

From the researches of LOUIS, MOHR, and HASSE, it would appear that tubercles exist in other organs besides the lungs in the pulmonary pthisis of adults in the following ratio. The bronchial glands were tuberculous in about one-fourth the cases; the mucous membrane of the trachea and larynx in one-twentieth only; the cervical glands in the same proportion; the intestinal canal in one-half the cases; the mesenteric glands in more than one third; the mucous membrane of the stomach very rarely; the serous membranes very often, and in the following order of frequency: — pleura, peritoneum, arachnoid, pericardium. The liver, spleen, urinary organs, brain, spinal chord, are occasionally implicated. The testicles, and

the mucous surface of the Fallopian tubes are also sometimes affected. With the exception of the brain and the heart, the absolute density and weight of most organs, more particularly of the lungs, liver and spleen, are augmented in tubercular phthisis. It therefore follows, that the enormous loss in weight sustained by the body, amounting, on an average, to about 50 lbs., is due to the loss of adipose substance.

CHAP. X.

TUBERCULOSIS OF THE BRONCHIAL GLANDS. — BRONCHO-GLANDULAR PHTHISIS.

168. THE bronchial glands may become the seats, either *primarily* or *consecutively*, of similar tubercular deposits to those found in the lungs. It is chiefly to the *primary form* of tuberculated bronchial glands that attention is now to be offered. This is almost exclusively *a disease of childhood*. In this primary form, originating in adult or advanced age, bronchial glandular phthisis is comparatively rare; and in the aged it is almost always the mere attendant of lingering pulmonary phthisis. Primary tuberculosis of the bronchial glands generally commences between the first and second dentition, and finishes its course with the appearance of puberty; although its consequences are sometimes manifest beyond this period. It is obvious that this form of the disease may be associated with tuberculosis of the lungs and of other organs. It may, however, run its course without any tubercles being deposited in the lungs; or the lungs may become implicated at any period of the glandular malady, and be disorganised with the glands; or lastly, bronchial glandular phthisis may subside.

The course of bronchial glandular phthisis is generally chronic; and the destruction and shrivelling of the affected glands proceed so gradually as to allow the organism time to compensate for the loss. "Hence it readily admits of reparation; nor is it in itself perilous, although accidental circumstances may render it fatal." (HASSE, p. 349.) The glands at the bifurcation of the bronchi are earliest attacked, and first pass through the several morbid

stages. Thence the morbid process generally diverges into three distinct directions:—first, to the lymphatic glands following the ramifications of the bronchi into the pulmonary structure; secondly, to those placed between the pericardium and the lungs and along the œsophagus in the posterior mediastinum; and, thirdly, to those which accompany the large vessels in the anterior mediastinum, and pass from thence to the trachea and the cervical plexus. Only where tubercles are primarily seated in the mesenteric glands do they appear to advance to those glands which follow the course of the œsophagus, passing thence to the cervical plexus. In some instances they probably originate in the glands of the neck.

An occasion seldom offers of examining tubercles, in these situations, in their nascent states. In these states they then appear as grey or yellow granules, up to the size of millet-seeds. In a short time the glands become so infiltrated with tubercles as to form a yellowish white friable substance, in which no vestige of the former healthy texture is discernible. They thus enlarge remarkably; those at the bifurcation of the trachea often attaining the size of a pigeon's egg, those within the lung that of a hazel nut, their size decreasing with their remoteness from the part first affected. Though but loosely attached in the midst of cellular tissue, in the healthy state, they now coalesce by its medium with the adjoining parts, especially with the bronchi, acquiring from the lardaceously condensed cellular tissue a firm isolating envelope.

169. These glandular enlargements but seldom produce very marked symptoms of compression of nerves or blood-vessels, although important trunks and branches run in their vicinity; but it is not improbable that the little attention hitherto paid to the lesions of the bronchial glands in children has led to the misinterpretation of the symptoms and effects produced by them, and to the disorders actually caused by them being imputed to other sources. It is extremely probable that *spasmodic croup*, *Laryngismus stridulus*, and other affections of the *trachea* and *bronchi*, are sometimes either caused, or aggravated, or perpetuated, by tubercular enlargements of these glands, nervous filaments and arteries being found, on careful dissection, traversing the localities of, and obviously pressed by, these glands. The veins, however, are more susceptible of pressure by them; but the bronchial canals are seldom much affected by them, owing to the resistance furnished by their cartilaginous rings, and to the more yielding structures adjoining. In some cases, notwithstanding, as shown by ANDRAL, the pressure has acted injuriously on the bronchi; and it

may, even in adults, be connected with the pathology of some cases of *asthma*.

170. The tuberculous deposit in the bronchial glands may long continue without much change; but more frequently it undergoes softening. HASSE states, that when the softening proceeds from the centre, one or more small excavations are found containing a purulent and gritty matter, and the process is tedious. When the softening commences at the circumference, the filamentous sheaths of the glands are highly vascular and puffy, constituting at last a mere cyst around the thick, yellowish, tuberculo-purulent fluid. From this period the tumour collapses, its contents either becoming gradually absorbed, or escaping through a passage made by them. Absorption proceeds very slowly, being carried on chiefly by the external vascular coat of the tumour, the inside of which coat has a red velvety appearance. Like a vomica, it generally possesses an unorganised membranous lining, formed of thickened pus and tubercle. The cavity thus produced does not, however, like the pulmonary excavation, continue to enlarge: its walls receive no additional deposition of tubercle, but rather protect from this occurrence; and in no case do two adjacent glands communicate or form one cavity. On the contrary, as the fluid contents are absorbed, the cyst contracts upon the more consistent residue, which, lessening gradually, acquires a cretaceous character, and ultimately is converted into a hard concretion. These products are often met with, even in youthful persons, in the place of one or other of the bronchial glands, especially at the bifurcation of the trachea.

“When the tuberculous mass has remained fluid until long after puberty, or the disease has arisen at a later period, black pigment becomes deposited, both in the unsoftened portion, and in the pap-like matter.” It is so intimately combined with the latter, as ultimately to form an uniform, black, smeary pulp. In such cases the tumour, whilst gradually contracting in dimensions, retains the same soft condition for years. Sometimes separate calcareous nuclei are found in the midst of the blackened mass. “This deposition of pigment within glands, totally degenerate and partially destroyed, is the more remarkable, as furnishing a proof of connection with the lymphatic vessels. It can scarcely be reckoned an immediate secretion from the glandular cyst and *necessarily* concerned with tubercular cicatrisation, because this process in other organs (the lungs excepted), and especially in lymphatic glands, is scarcely attended by any deposition of black pigment.” (HASSE.)

Softened tubercle often escapes by perforating the bronchi, generally from without inwards, the tuberculo-purulent fluid bursting through the bronchus. Years are in such a case required for perfect recovery, which is brought about either by the gradual healing of the aperture, whilst the subjacent gland shrivels away; or by the closing of it, ere the contents of the gland are entirely voided; the remainder afterwards passing through the several phases, until it undergoes the calcareous change. Sometimes the irritation is renewed at a subsequent period, and the concretions come away.

171. Various other consecutive lesions supervene contingently upon those now mentioned; but these are individually of so rare occurrence as hardly to deserve enumeration. The chief of these are — 1st, the escape of the tuberculated contents of a bronchial gland into the parenchyma of the lung; — 2ndly, perforation into the pleural cavity, where the softened glandular mass is situated immediately under the pleura, at the interlobular divisions (BERTON, RILLIET, and BARTHEZ); — 3rdly, perforation of the œsophagus (BERTON and LABLOND); — 4thly, simultaneous perforation both of the œsophagus, of the trachea, and of the pericardium (SYME); — and 5thly, perforation of the parietes of one of the large blood-vessels. Of each of these only two or three instances have been recorded.

172. In *children*, in whom alone this disease appears primarily or independently, the lymphatic glands of other parts, especially of the mesentery, often afford the sole evidence of concurrent disease. The lungs are, in particular, sometimes quite free from tubercles. PAPAVOINE states, that of forty-nine children affected with tubercles of the bronchial glands, but thirty-eight had tubercles in the lungs. My experience, however, is more in accordance with RILLIET and BARTHEZ, who never found other organs in children tuberculous, without the bronchial glands being pre-eminently so. Still bronchial glandular phthisis in children often induces acute tubercular disease, the lungs, the liver, the spleen, the kidneys, the serous membranes, &c., being all found, in various degrees and frequency, to contain recent tubercles. In *adults*, on the contrary, in whom either recent, or the remains of former, bronchial glandular phthisis may be discovered, tubercular disease of the lungs always predominates, and is in itself fatal.

173. The usual *physical signs* of this form of tuberculosis are, feeble respiratory murmur on one side, owing to pressure of one or more swollen glands on the bronchial tubes, dulness on percussion in the interscapular regions, bronchial respiration, mucous rales, and sometimes gurgling. If the rational signs of phthisis, as, persistent

cough, emaciation, shortness of breathing, wheezing, &c., are present, while the physical signs are absent over the chest, except at the parts above named, the disease may be viewed as bronchial glandular phthisis. This form of phthisis is most frequently met with between the second and twelfth years of age, in the scrofulous and lymphatic diathesis,—is often consequent upon bronchitic and catarrhal attacks and upon pertussis; and, owing to the cough accompanying it being very frequently paroxysmal, it is often mistaken for whooping-cough. As the glandular disease advances, the indications of tuberculosis of the lungs are more and more manifested. The respiration becomes more wheezing and oppressed; the face becomes swollen, and the veins of the neck, chest, and head distended. In young children, the expectoration is generally swallowed, but in the older it varies with the extension of the malady, being chiefly bronchial and ropy, and if perforation of a blood-vessel is produced by the pressure of the enlarged glands, hæmoptysis occurs at an advanced stage.

CHAP. XI.

THE PROGNOSIS, DURATION AND CURABILITY OF PULMONARY CONSUMPTION.

i. PROGNOSIS.—THE issue in most cases of phthisis may be viewed as apparent from what has already been adduced. But there are *two* sources of information as to the result in individual cases, namely, the existence, the severity, the character, and the procession of the symptoms, and the influence of the treatment upon the symptoms.

174. A. The more *favourable* may be the opinion as to the duration, if not of the ultimate issue, of the disease, the earlier the period or stage at which it comes under treatment, and the slower the pulse, and the less acceleration remarked in it by change of posture, by cough and by mental excitement.

The absence of the flocculent and puriform characters of the sputa in the advanced stages, and of the symptoms and signs of pneumonia, pulmonary congestion, pleurisy, &c.; an increase of flesh, strength, and weight, or even the arrest of progressive emaciation; the non-appearance of night or morning sweats or diarrhœa; the respiration remaining only moderately accelerated, or not being accelerated in a much greater ratio than the pulse; the absence of marked anæmia, emaciation, and debility, and of the other com-

plications besides those just mentioned; the persistence of accustomed discharges, and the continuance in females of the catamenia in the natural or accustomed state; the tolerably regular discharge of the several secreting and excreting functions, especially those of the bowels; quiet repose during night; a mild form of the hectic fever and an improvement in one or more of the chief symptoms and signs of the malady, may severally or all be viewed as indications of a slow or protracted, if not a curable, state of the disease.

The results of treatment in controlling the more important symptoms and signs, and especially in mitigating or arresting, and the influence of change of climate and of locality, should be duly estimated in forming a prognosis and in imparting our opinion of the issue to friends, or to the patient himself. The hopes of recovery in an early stage of the malady is now much greater, and justly greater, than they were thirty or even twenty years ago. But the more successful results have not been the fruits of special or even of public institutions, but of the enlightened knowledge furnished by a due study of the functions of life as displayed throughout the whole human economy.

175. *B. Much less favourable*, and indeed most commonly *unfavourable*, are the following: — Rapidity, softness and smallness of the pulse, or a pulse ranging about or above 100 in the adult; quickness of respiration above the ratio which the respiration bears in frequency to the pulse; the states of the sputum indicating the second or third stages of the disease; the appearance of aphthæ on the tongue or mouth, or the symptoms or signs of any of the chief complications described above (§§ 104, *et seq.*); the occurrence of profuse sweats or diarrhœa, without any obvious cause; inability to lie on either side; great emaciation or the production of bed sores; manifest anæmia conjoined with great rapidity and smallness of pulse; great dyspnœa and oppression throughout the thorax; suppression of accustomed or natural discharges or evacuations, more particularly of the catamenia in women; a clubbed and fusiform state of the fingers, and incurvation of the nails; loss of the hair, with profuse perspiration from the scalp, neck and chest; pain and constriction extending between the sternum and spine; the occurrence of a wandering delirium during the febrile exacerbation of the evening and night; and the loss of appetite for food, are the chief indications of a progressively fatal state of the disease.

176. The hæmoptysis so frequently indicating the commencement and progress of phthisis, as well as being an important complication, may, according to its character and amount, be either a

favourable or an unfavourable occurrence. If it be an early or incipient occurrence, the pulse being neither very frequent nor small; if the pulse fall in frequency, and if oppression in the chest, and difficulty of breathing be diminished by it; if it be of a moderate amount, or even if it be very abundant, and be followed by an amelioration of the symptoms, it may prove even beneficial, by removing pulmonary congestion and incipient inflammatory action, although the presence of a portion of the blood in some of the bronchi may excite inflammatory irritation of their mucous surface. When, however, the hæmoptysis is very scanty, or merely streaks the expectoration, or if it be brownish, rusty or black, and at the same time scanty or very moderate, it then may be viewed as an unfavourable circumstance, or as indicative of active congestion, or of congestive pneumonia of a portion of lung; if it be abundant, protracted, and the blood very dark and gelatinous, no relief of the oppression and dyspnœa following it; and if, in either case, the pulse becomes even more frequent, and the respiration more rapid, the danger is great. In a case of this last description, which I saw many years ago at Lowestoft with Mr. WORTHINGTON, and in others to which I have more recently been called, an arrest of the hæmorrhage was procured by means of the oil of turpentine, and the recovery became complete under the treatment advised in the sequel. Hæmoptysis at an advanced period of the disease, more especially when cavities are formed in the lungs, and the loss of blood large, is always an alarming symptom. The same opinion should be formed if the expectoration be of a sanious, ichorous, or offensive character, or if it contain shreds or small pieces or patches of disorganised substance or tissue.

177. The existence of cavities, although clearly indicated by all the usual physical signs, is not a sufficient reason for viewing the disease as beyond amelioration or even cure, if the pulse and respiration be not greatly accelerated, and the other symptoms be not unfavourable, and especially if the flesh and strength of the patient be not very much reduced; for one or even more cavities may exist in the lungs, and still sufficient healthy structure may remain to perform the functions of respiration, provided that these functions be not too heavily taxed, and that the remaining lungs be not the seat of inflammatory action or congestion, or of tubercular deposit. The falling in and immobility of the parietes of the chest, with great acceleration of the respiration and pulse, difficult respiration, sweats, diarrhœa and aphthæ are in such cases the indications of a not far remote dissolution. If the patient, not

having retrograded during winter or spring, experiences an aggravation of all the symptoms upon the sudden occurrence of warm or hot weather, it may be inferred that no amelioration can be expected; for I have observed, that patients thus affected by the transition to a range of temperature of about 70° or upwards, generally do not survive above a very few months; and that those who are improperly sent to a warm climate at an advanced stage, soon have their existence terminated by the injudicious change.

178. ii. DURATION OF TUBERCULAR CONSUMPTION.—It is not improbable that tubercles may exist in the lungs of a person, hereditarily or constitutionally predisposed to phthisis, from an early age in a quiescent state, or without advancing to the stage of softening, without shortening by many years the duration of life. This is more likely to occur when the determining causes of the disease have either been avoided, or have not acted with much intensity. Instances have come under my own observation that have been characterised by the chief symptoms of the first stage, and by occasional attacks of hæmoptysis, from an early period of life, and yet they reached to upwards of 60, and in two cases to 68 and 69 years. I have no recollection of an instance of 70 having been passed in such circumstances; but Dr. GREGORY mentions a case of a person who was consumptive from 18, and died of the disease at 72 years of age.

Phthisis, with the exceptions arising from the occurrence of acute states of the disease, is generally chronic or protracted. Its duration is much shorter in hospitals, and wards containing a number of cases of the disease, and in crowded workshops and manufactories, &c. than in social life. In 215 fatal cases at the Hospital for Consumption—in 193 cases observed by LOUIS, and in 200 noted by BAYLE, the duration was as follows:—

Duration.	Hospital.	Louis.	Bayle.
Less than a month	—	1	1
In one month	—	3	1
From 1 to 3 months	1	11	14
„ 3 to 6 months	22	52	44
„ 6 to 12 months	66	62	64
„ 12 to 18 months	34	24	30
„ 18 to 24 months	22	17	18
„ 2 years to 3 years	29		
„ 3 years to 4 years	13		
„ 4 years upwards	14		
„ 2 years to 8 years	—	23	18
„ 8 years to 20 years	—	—	10
Doubtful	14		

179. Although tubercles in an early stage may long remain latent or quiescent, yet when they begin to soften, there is every reason to suppose that their advancement is progressive, although at varying rates, or even so slow as to be nearly stationary. It is manifest that numerous circumstances after the commencement of phthisis must tend to accelerate its progress on the one hand, or to retard or arrest its course on the other. The continued or occasional operation of any of the causes of the malady—season, weather, climate, age, sex, constitution of the patient, medical treatment, diet and regimen, may operate in either way. In the Hospital for Consumption it was observed that of those who died within eighteen months 60·5 per cent. were males, but only 50 per cent. were females; whilst of those who lived beyond eighteen months, 31·9 per cent. were males, but 45·5 per cent. were females. According to the tables of LOUIS and BAYLE, the duration of the disease was twenty-three months, which nearly agrees with M. ANDRAL's experience at La Charité. Sir J. CLARK remarks that in the upper ranks of society, where patients have all the advantages of the best regimen, of change of air, and of medical treatment, the average duration of phthisis is probably not much short of three years.

According to the above statement, *Hospitals for Consumption* must appear of at least very doubtful benefit to the community, as respects both the patients received into them and the advancement of medical knowledge; the above statistics being the only information as yet afforded by them. It may be admitted, however, that, as regards the most wretched of the lowest classes of the community, though the duration of life may not be prolonged by hospitals, the comforts enjoyed in the last remnant of existence may be increased in them. But is the majority of patients admitted belonging to the most wretched of the lowest classes? If it be not the great majority, then the great object of these charities is not obtained, but is misplaced. If the public have expected, as it has been repeatedly told and most delusively promised, that the knowledge of the nature and treatment of pulmonary consumption is to be advanced by these institutions, this expectation has not been as yet realised; and from every consideration of the physical and vital constitution of man is not ever likely to be realised. But, this specious parade of the advantages of special institutions for the treatment of special disease, as well as the special study and practice of disease, is one of the most important delusions of the age, is founded chiefly upon the mechanical, manufacturing

and commercial spirit of the times, and is unsupported by scientific views, by reliable facts, by sound arguments, and by enlightened experience.

180. MAY CONSUMPTION BE CURED?—The curability of consumption, especially in an early stage, is admitted by every experienced and scientific physician. The cure of the malady is always an object kept in view until a far advanced stage—until the state of the pulse, the emaciation, colliquative discharges, and the physical signs furnish indications of the inefficacy of the means which have been employed. Most of these means are also, even in that stage, and in these circumstances of the case, the most appropriate for alleviating the more urgent symptoms, for protracting or arresting the progress of organic lesions, and of contingent complications, and thereby for prolonging life. Close observation during the lives of patients, and examinations after death, have proved that, in many cases, even where organic lesions of the lungs, such as vomicæ and cavities have been formed, as shown above (§§ 154 *et seq.*), recovery has taken place; and that the subjects of the malady have continued to live the more usually prolonged period of existence, or for many years,—some in tolerable health, others in a more or less delicate condition, and many as invalids. The results vary in different cases, according to the predisposition, diathesis, or constitution of the patient; to the progress the disease had made when a suitable treatment was instituted, and to the regimen, care &c., observed subsequently. I have in many instances had every reason to infer, from both the constitutional and the physical signs, the existence of vomicæ and cavities in the lungs, and nevertheless recovery had taken place, and life had been prolonged for many years, with either a good or very tolerable or impaired health. In some cases, death has taken place from other diseases, or from a recurrence of the same disease, many years after consumption had commenced, had advanced, and been arrested or cured; and cicatrices have been found in the lungs, or cavities, often of very considerable sizes have existed, the parietes of which had been converted into smooth, cartilaginous, or fibro-serous surfaces, showing that a healing process had taken place, and that these cavities had long existed in this state of restoration. The appearances of cavities and of cicatrices of various sizes and ages, are fully described above (§§ 157 *et seq.*) and are quite demonstrative of recovery, and of the duration of life for very many years after the disease had made very considerable or even great progress. I have already noticed cases of partial and complete

recovery, which have occurred under my care, and I could make mention of many more, if it were requisite, for which I have been consulted in the course of my practice, and which have been observed by other medical men who had more frequently attended to them. Indeed not a few of these cases have occurred in the families or relatives of medical practitioners, by whom I was consulted respecting them.*

CHAP. XII.

THE CAUSES OF PULMONARY CONSUMPTION.

THE causes of phthisis may be supposed to have been fully ascertained, and the extent of their influence in producing this very prevalent and dangerous malady duly estimated, both individually and concurrently, by the numerous writers who have treated of them and of the forms and symptoms of the morbid effects which they occasion, and to which the various appellations enumerated above (p. 1.) have been applied. Yet these causes have been imperfectly observed, often incorrectly imputed, whilst some have been entirely overlooked, and, as respects certain states of the disease, their sources, nature and co-operation, insufficiently investigated.

181. The influence of hereditary predisposition, and its very frequent if not general dependence upon the scrofulous cachexy, are fully admitted, but several of the other remote or predisposing causes, which appertain especially to the parent or parents, and influence the organisation of the offspring, are insufficiently recognised. The predisposition, also, which is generated, and the more direct effects produced in the frame by the causes which depress the vital influence or force — whether mental or physical — whether morally or corporeally exhausting — in circumstances peculiar to the individual, by the removal of agents to which the

* A man of great literary eminence took his wife to Italy in 1821. She had been phthisical for a very considerable time, and had suffered several attacks of hæmoptysis. Dr. VACCÀ, of Pisa, saw her soon after her arrival in that city. He stated to her husband her almost hopeless case, and "little hope was given by him and others that she could survive beyond the year." She lived, however, till the year 1857. "The expectoration," this eminent writer remarks, "of blood, &c., sometimes in alarming quantities, and never entirely without recurrence, lasted throughout a life of no ordinary duration."—*The Autobiography of Leigh Hunt*. 8vo. London, 1860, p. 317.

frame has become habituated, or which are necessary to health, and by the action of other agencies, which are either obscure or concealed, or are merely concurrent in their operations with more prominent or commonly admitted causes, are often overlooked or not known; and thus the advantages connected with their prevention and removal are altogether lost. Hence, these *causes* being unknown or unsuspected, their *effects* cannot be prevented; and the means necessary to the removal of the former, or the cure of the latter, are either altogether neglected, or employed accidentally, empirically, and often inappropriately.

Though pulmonary or tubercular consumption may occur independently of a pre-existing scrofulous taint, whether hereditary or acquired, yet the former is so frequently the development of this taint into the state of tubercular consumption by means of the causes more especially affecting the respiratory organs and functions, that it becomes unadvisable to disconnect the consideration of the causes of the *special* development and manifestation of the *generic* or constitutional condition from the due appreciation of the causes of this condition itself. The causes of this latter are the predisposing, and not infrequently the most efficient causes of the internal and local morbid state. The general morbid condition may exist, as a state of predisposition merely, without the special pulmonary malady, or any other form of tubercular malady, being developed, the causes of the generic or general morbid condition either being insufficiently powerful to develop the local manifestation,—the tubercular deposit,—or requiring the influence of additional or determining causes for its development.

When treating of SCROFULA (§§ 13, *et seq.*), in the work already referred to, the *causes of this generic disease* were then fully described; but the *causes*, which, whether acting singly, or in combination, develop *this species of malady*, require attention, more particularly with reference to their modes of action. Certain of these causes, however, which have been fully considered in the work now referred to, will only be slightly noticed, or noticed with reference to this specific disease; whilst others will receive that attention which their importance demands, with due regard not merely of the *causation*, but also of the prevention of this malady.*

* CLASSIFICATION OF THE CAUSES OF TUBERCULAR CONSUMPTION.

i. THE CAUSES APPERTAINING TO ONE OR BOTH PARENTS.

A. *Hereditary Constitution, or Predisposition.*

a. Transmission to the fetus, or infant.

b. Extent of hereditary transmission.

i. THE CAUSES APPERTAINING TO ONE OR BOTH PARENTS.

182. A. *The hereditary transmission of phthisis* is proved,
— 1st. By the frequency of the disease in the offspring of parents

B. *Diseases of the Parents productive of Tubercular Consumption.*

- a. A syphilitic cachexia.
- b. A constitution impaired by mercurial courses.
- c. Exhaustion of vital power, or debility caused by excessive sexual indulgences, or by masturbation.
- d. A gouty diathesis.

C. *The Ages and the Social Condition of the Parents.*

- a. Premature congress in respect of either parent.
- b. Far-advanced age, especially of the male parent.
- c. Influences of circumcision or uncircumcision.
- d. Intermarriages.
- e. The occupation of the parents.

D. *The Modes of Living of the Parents, in respect of Food and Drinks.*

- a. Insufficient or unwholesome food, — pork, bacon, &c.; blood and viscera of animals, &c.
- b. A vegetable and animal diet considered; fish, &c.
- c. Intemperance, and addiction to spirits, — in the male, in the female.
- d. Causes acting on the female during gestation and lactation.

ii. CAUSES ACTING CHIEFLY DURING EARLY LIFE, OR PREVIOUSLY TO PUBERTY.

A. *Inappropriate Food, Drink, and Regimen of Infants and Children.*

- a. During infancy. The milk of strumous or phthisical nurses.
- b. Insufficient or unwholesome food in childhood.
- c. Sleeping with the aged, debilitated, or phthisical.
- d. Insufficient clothing and bed-clothes, and cold sleeping apartments.

B. *Contaminated, Cold, and Humid States of the Air.*

- a. Overcrowding, congregating, or sleeping in great numbers, in a close apartment, &c.
- b. Exhalations from privies, cesspools, drains, or from swamps, &c.
- c. Emanations from the lungs and skin of the phthisical.

C. *Employments, Exercises, Amusements, and Regimen previously to Puberty.*

- a. Sedentary employments, irksome occupations, &c.
- b. Deprivation of out-door exercises and amusements.
- c. The congregation of numbers in factories, rooms, houses, and sleeping apartments.
- d. Dress, day and night clothing.
- e. The influence of light, sunshine, and temperature, especially the deprivation of these.
- f. The influence of low temperature, humidity, and exhalations, &c., during sleep; sleeping apartments, &c.

iii. CAUSES MOST FREQUENTLY ACTING DURING AND SUBSEQUENTLY TO PUBERTY.

A. *Amusements, Exercises, Occupations, Clothing.*

- a. Ill-regulated studies, amusements, and exercises, in both sexes.
- b. Positions of the trunk of the body, supports, stays.

of a scrofulous diathesis or taint, whether quiescent or internally or externally manifested. 2nd. By the presence of tubercles in

- c. Improper clothing in respect of the several regions of the body.
- d. Cold sleeping rooms.

B. *Trades, Employments, and Conditions of Life.*

- a. Trades which are injurious by preventing exercise in the open air.
- b. Occupations in which dust, or other irritating matters are inhaled, — grinders, sculptors, &c.
- c. Occupations which are exposed to great vicissitudes of temperature and weather.

C. *The instinctive Desires and Emotions.*

- a. Premature or excessive sexual indulgence.
- b. The vice of masturbation.
- c. Celibacy.

D. *Mental Exertions and Affections.*

- a. Intense or prolonged mental exertion.
- b. The depressing mental emotions and affections.
- c. Nostalgia.
- d. Prolonged anxiety. Disappointed hopes and affections.

IV. CAUSES CONSISTING OF CONTINGENT OR ASSOCIATED INFLUENCES OR CIRCUMSTANCES.

A. *Sex, Age, Diathesis, and Temperament.*

- a. Sex, age, &c.
- b. Diathesis and temperament.

B. *Seasons and Atmospheric Conditions.*

- a. Humidity, dryness, temperature, and other atmospheric conditions.
- b. The seasons, — winter, spring, summer, and autumn.

C. *Climate and Locality.*

- a. Climate and locality of various countries.
- b. Climate in connection with modes of living.
- c. Climate in connection with religious and social observances.
- d. Prevalence in England, London, &c.

D. *Influence of Confinement in Prisons, Workhouses, and of Expatriation.*

- a. Prisons, hulks, &c.
- b. Workhouses, &c.
- c. Expatriation, &c.

E. *Vicissitudes of Fortune, Anxieties, Disappointments, &c.*

- a. Poverty and distress.
- b. Loss of reputation, of friends, &c.

V. PATHOLOGICAL CAUSES OF PHTHISIS.

A. *Previous Diseases of the respiratory and circulating Organs.*

- a. Catarrh, catarrhal fever, influenza.
- b. Bronchitis, pneumonia, broncho-pneumonia.
- c. Hooping cough, Asthma.
- d. Vascular lesions of the heart, with or without hæmoptysis.

the foetus, and in infants of tuberculous, phthisical or scrofulous parents. 3rd. By the existence of tubercular consumption in the offspring of a scrofulous mother or scrofulous father; and the scrofulous parent having died, the children of a parent of a sound constitution, in cases of a second marriage, having been exempt. 4th. By the occurrence of the malady in a family in which no other cause exists. 5th. By the hereditary transmission of the disease in the lower animals. DELAFOND states that a phthisical ram produced the disease in from sixteen to twenty sheep.

183. Phthisis may be transmitted to the offspring, — 1st. As a predisposition, or proclivity, or diathesis, or taint — terms which are nearly synonymous. 2nd. As a latent germ, which may be quiescent for many months or years. 3rd. In a more or less developed state in the foetus. The scrofulous taint of the parent, although quiescent, may give rise either to external scrofula, or to internal tuberculosis in the lungs, or in some other organ, or in several organs or tissues, especially in children and young subjects. External scrofula, or external glands which have fully suppured, is less likely to be followed by phthisis than the quiescent scrofulous taint; but either condition will transmit phthisis to the offspring. The transmission may not take place in the children, and yet appear in the grandchildren. The predisposition, rising either from the scrofulous taint or from declared tubercular disease of some organ or tissue, may remain dormant through life, not having been roused by the exciting and determining causes into activity, or developed in the form either of glandular enlargement, &c., or of tubercular consumption, so that it cannot be inferred that the offspring of a scrofulous or phthisical parent or

B. *Exanthematous Diseases.*

- a. Vaccination, small-pox, &c.
- b. Measles, scarlet-fever, &c.

C. *Suppressed or excessive Secretion and Excretion.*

- a. Suppression of the cutaneous excretions.
- b. Excessive secretion or excretion, — prolonged suckling.
- c. Disordered, suppressed, or excessive catamenia.

D. *State of organic, nervous, or vital Power.*

- a. Hereditary debility.
- b. Acquired debility.

E. *Morbid State of the Blood.*

- a. Anæmia.
- b. Chlorosis.
- c. State of the hæmato-globulin.

parents, who has not been affected with either scrofula or phthisis, is, therefore, free from the constitutional taint, or in other words, from the hereditary predisposition. It is manifest, however, and it will appear still more manifest hereafter, that a very varying proportion of those attacked with phthisis in any community or climate shall have been thus afflicted from hereditary predisposition, numerous other predisposing and exciting causes being sufficient to develope the malady in those not hereditarily or even constitutionally liable to the malady.

184. *a.* As to the proportion of cases of phthisis that may be referred to hereditary taint, authors differ widely. RUYSCH says that four fifths are hereditary; M PORTAL, two thirds; Mr. ANCELL, one third; M. PIORRY, one fourth; BRIQUET, 36 out of 90; RUFZ, 24 out of 35. Mr. ANCELL states, that in the Consumptive Hospital $24\frac{1}{2}$ per cent. of consumptive patients were born of phthisical parents. My own experience gives 47 per cent. or nearly one half. M. ROCHE considers that the children of phthisical parents are doomed to the disease, and such may be the case if they be subjected to one or more of the causes which occur previously to, or during puberty and early manhood. M. LUGOL states, that more than half the subjects of tuberculosis have consumptive progenitors. Of 141 persons affected with scrofulous glands, whose family history was investigated by Dr. BALMAN, the following accounts were furnished:—

The <i>Fathers</i> died of phthisis in	9
One or more deaths occurred from phthisis in the families of uncles and aunts on the father's side of	61
Grandfathers on the father's side died of phthisis	11
Grandmothers on this side	17
	<hr/> 98
The <i>Mothers</i> died of phthisis of	11
One or more deaths from phthisis in the families of uncles and aunts on the mother's side of	38
Grandfathers on this side died of phthisis	9
Grandmothers	20
	<hr/> 78

In 30 of the 141 scrofulous persons, no death from phthisis in either parents or collateral relations were ascertained; but whether the latter exhibited signs of tuberculous taint or disease does not appear. In the Hospital for Consumption, of 669 *males*, 122, or 18·2 per cent.,—and of 341 *females*, 124, or 36·3 per cent. were predisposed by the disease having existed in a parent or parents.

185. *b.* As to the relative frequency of the transmission of *phthisis* in the two sexes opinions are opposite, and statistical information is very imperfect. J. P. FRANK, J. FRANK, M. BRIQUET, RICHARD, and PHILLIPS, favour the more frequent transmission by the father, whilst NASSE and others entertain an opposite opinion. From the Report of the Hospital for Consumption, it would appear that, omitting those cases in which both parents were consumptive, the father transmitted the disease to sons in 59·4 per cent., and to daughters in 43·5 per cent.; and that the mother transmitted the malady to daughters in 56·5 per cent., and to sons in 40·6 per cent. The numbers from which the above results are calculated are, however, insufficient to be relied upon; nor can the facts be determined with precision, especially as respects the absence of any taint in either parent. In the cases in which I observed with care the constitution of both parents, the taint existing only in one parent was communicated in very nearly an equal ratio to both sexes of the offspring.

186. *c.* The question may be asked, *In what manner or way is the hereditary predisposition transmitted?* Is it by the general organisation or constitutional formation, or by the blood, or by miliary germs? But previously to the consideration of this topic, it may be asked, Is the tubercular taint, either quiescent or manifested by internal or external tuberculosis, necessarily transmitted from parent to offspring? That it is thus transmitted, when both parents are predisposed or tainted, cannot be doubted. The taint may be latent, not having been developed into active disease owing to the inefficiency of the exciting causes. When, however, one parent only is thus tainted, all, or only some, or even none of the offspring may be predisposed, the taint being limited to one or more, or extended, in various grades to several or to all. That the constitutional taint may exist in the offspring in the form of *miliary germs* is possible, inasmuch as several observers as well as myself have detected these germs in the foetus, where the taint has been manifested in either or in both parents, especially the mother; but this cannot therefore be considered as the usual manner in which the evil is transmitted. It has been supposed to be always conveyed in the blood—the taint existing in the blood of the foetus and of the individual into which the foetus is developed in all the stages of growth and existence. This supposition may be correct, but various considerations militate against it. 1st. There is no proof, either chemical or microscopic, of the fact. 2nd. The predisposition or taint being permanent, it cannot be inferred as always

existing in the blood, which is continually undergoing changes by the functions of secretion, nutrition, and excretion—by the processes of assimilation and of waste—by the metamorphosis of the globules from the states of those existing in the chyle, through those forming the red blood, to their final extinction by the secreting and excreting organs. 3rd. If it exist in the blood it must necessarily vary with the changes and constitution of the blood, or even be eliminated from the blood, during the processes just referred to, or by the agents often passing into and affecting the circulation, or in the course of diseases which sensibly alter the states of the blood; but no diminution or alteration of this taint has ever been produced in consequence of any or of all these agencies. That this predisposition or taint is one not existing primarily in the fluids, although more or less manifestly affecting these fluids, both the circulating and the secreting, may therefore be inferred; and that it is present in those parts of the solids upon which digestion, assimilation, and nutrition mainly depend, must necessarily appear as a rational conclusion—that it is as much a part of the constitutional conformation—of the intimate organisation of the tissues and organs, as of the conditions and contour of the several parts and features of the individual, and of the states of intellectual and moral development and power.

187. *B. The disorders of the parents predisposing to tubercular consumption in the offspring* are chiefly the scrofulous taint; the syphilitic cachexia; a constitution impaired by mercurial courses, or by excessive doses of mercury; exhaustion of vital power, or the debility caused by age, sickness, excessive sexual indulgences, or by masturbation; and a gouty diathesis. It is impossible to separate the baneful influence of secondary and tertiary syphilis from the effects produced on the constitution by excessive or prolonged courses of mercury, as, in former times especially, both were often more or less injurious to the frame of parents, and most frequently in connection with each other. That parents thus circumstanced may have children free from any scrofulous or phthisical taint may be conceded, but that their offspring are much more frequently thus tainted, than the children of parents who have not been similarly circumstanced, I am convinced by careful observation. Premature and excessive sexual indulgences, and more especially masturbation, particularly as regards the male parent, have a very marked influence upon the constitution of the offspring, if indeed any offspring be produced by persons thus exhausted. In most instances, the children of these parents are puny, very generally tuberculosed,

the membranes of the brain, the substance of the lungs, and other organs being often the seats of the tubercular deposits, to an extent incompatible with the duration of life for any number of years or even of months; or if the effects are not so severely and early manifested, a predisposition is at least communicated to the offspring to external scrofula, in childhood or about the period of puberty, or to pulmonary tubercles about the same epochs or at later ages.

188. *a. That very aged, gouty, exhausted or debilitated parents* have children much more predisposed to external scrofula and internal tubercular formations, than the offspring of healthy, mature, or young parents, has been asserted by many, and denied by some. It is, however, confirmed by common sense, by close observation, and by the opinions of the best writers. That the children of such parents are delicate in constitution is generally admitted. FERNELIUS, no mean observer, remarks: "*Senes et valetudinarii imbecilles filios vitiosa constitutione gignunt;*" and VAN SWIETEN has illustrated the opinion with his wonted ability. In estimating the influence of the parents in causing phthisis in their offspring, the following may be viewed as the chief sources; viz. hereditary predisposition, constitutional syphilis, far advanced age of the male parent, masturbation, premature or excessive sexual congress in respect to either or both parents, and an early or intemperate use of spirituous liquors or of tobacco.

189. *b. Social position of the parents.*—The influences of *circumcision* and of *uncircumcision*, the former as tending to prevent, the latter as favouring, a predisposition to the scrofulous taint, have hitherto been entirely overlooked; or if any attention, even the least, have ever been directed to the matter, it has certainly been by no means adequate to its importance, as respects the constitutional and mental powers of the offspring. The subject has hitherto been viewed entirely as a religious rite, altogether superseded by the doctrines of Christianity; but unjustly superseded by the earliest schismatics in the Christian Church—by some of the apostles themselves. Circumcision, however, as practised by the followers of MAHOMMED is very different from that inculcated by ABRAHAM. By the latter, the whole of the prepuce was directed to be extirpated at a period of life most proper for the operation; whilst the former often resorted merely to an incision. The advantages of the Jewish rite are not merely those which have usually been imputed to it; namely, the prevention of the usual effects of the retention of the follicular secretion under the prepuce; but chiefly the prevention of that excitement to masturbation about the period of puberty,

experienced by, and so frequent among, the uncircumcised, especially in warm countries; and the more prolonged act of sexual congress, and the more complete as respects the female, than in persons otherwise circumstanced. The general results in connection with other predisposing causes influencing the constitution of both parent and offspring, notwithstanding several powerful counteracting circumstances, are more prolific marriages, and the less frequent occurrence of the scrofulous, phthisical, and gouty constitutions, in the Jewish than in other races.

190. (c.) *Does the milk of a scrofulous or phthisical nurse occasion scrofula or phthisis in the child?*—Mr. PHILLIPS has ably discussed this topic, and has adduced opinions in the affirmative as well as negative. BORDEU said that scrofulous nurses communicate the disease to the child. WHITE, FAURE, LALOUETTE, and PUJOL, on the contrary, denied that a nurse could transmit scrofula to her nursling. "But the impression that the disease may be thus communicated, exists on the minds of many medical authorities in the present day." Yet in the support of this opinion, Mr. PHILLIPS states, that he knows no single well-observed fact on record. I agree with him in concluding that, although there is no proof of the justness of the opinion, "that the disease may be propagated in this way, neither is it easy to procure proof that it could not happen, since such proof could only be negative; meanwhile, as all our present evidence is negative, we are justified in saying that such communication is, in the present state of our knowledge, inadmissible." Though the difficulty is very great of adducing evidence as to the milk of a scrofulous nurse occasioning scrofula in the child, yet there can be no doubt of the propriety of avoiding this risk. But there should be no hesitation in preventing a phthisical nurse or mother from nursing a child, the risk to the child being obviously great, both from the milk and from the breath of the nurse, whilst suckling will accelerate the fate of the nurse.

191. (d.) *Frequent intermarriages, or marrying in and in.*—It has been alleged by Mr. CARMICHAEL and others, that frequent and close intermarriages are generally followed by a puny race, and frequently by scrofula, in one shape or another. On this topic Mr. PHILLIPS remarks, that there is no clear evidence of the bad consequences either on the mind or body, of frequent intermarriages. As concerns the human race, the point is not easily elucidated, and the evidence is not conclusive that the practice is very injurious in the lower animals. Isolated classes, as Jews, Quakers, &c., furnish no evidence in support of the opinion; but the isolation of these

or other classes is not so complete as to determine the question. The closest intermarriages or connections between the sexes exist in several countries of Central Asia, as Thibet, &c.; but the inhabitants are said to be robust and healthy, the population being, however, kept down by one female in a family having several husbands, and those frequently her nearest male relations. Mr. PHILLIPS concludes, that intermarriages among healthy persons tend to no such calamity as the production of scrofula; but that he must not be understood to assert that other physical or mental influences may not result from such unions. I believe, however, that a comprehensive consideration of the subject, and with reference to the lower animals, as well as to man, will show that a close breeding in and in, when continued for more than three or four generations, will occasion a degeneration of the offspring; whilst crossings of races or breeds will give rise to increased development of constitution and power, especially in the weaker race. The Turks and Persians are manifestly indebted to the females of Georgia and Circassia for the best of their constitutional features; and few who have taken any interest in tracing the history of aristocratic families, even in this country, and are acquainted with the private histories, the intrigues, and intermarriages or crossings of many of them since the commencement of the seventeenth century, can fail of knowing how often family descent has thereby been preserved nominally, although not most legitimately.

As to the influence which the several professions and occupations of life followed by the parents may exert on the health of the offspring, it is most difficult to arrive at a conclusion, as statistics can furnish no precise data. Whatever injurious effects may be produced, is certainly manifested in the guise of tuberculosis, in one or other of its forms and seats. The only inference which can be drawn with justice from the professions and employments of the parents is, that such as are most conducive to the promotion of health and strength, will be most likely to favour corresponding effects in their children.

192. (e.) *Does the habitual use of certain articles of food by the parents predispose the offspring to scrofula or tubercular consumption?*—It has been supposed that pork and the viscera and blood of animals, favour the occurrence of gout in those who frequently use them as food, and often give rise to scrofula in their offspring. That these articles of diet are very often productive of diarrhoea, dysentery, and other disorders of the digestive organs, more especially in warm climates, cannot be disputed: and

I believe that the offspring of those who live much on pork and bacon are more liable to scrofula, in some one or other of its forms, than persons who use a different or more wholesome diet. The food of the parents may reasonably be expected to influence the constitution of the offspring, and hence to predispose to certain diseases, in preference to others. It is difficult to determine the influences, either of an excessive use of animal food by the parent or parents, or of the restriction to vegetable diet solely, in causing scrofula in the offspring; but that either extreme may have a predisposing effect, especially when aided by other causes, may be reasonably inferred. That the vegetable diet of the Hindoos does not exempt them from the presence, if not from the prevalence, of struma, appears to be established. It is not improbable, however, that a vegetable diet in a temperate and healthy climate, when it is wholesome in kind and quite sufficient in quantity, does not, *cæteris paribus*, predispose the offspring to this distemper; whilst the excessive use of animal food, and more especially of the articles of food just noticed as often injurious, is more likely to produce a noxious effect.

193. (f.) *Insufficient*, as well as *unwholesome food*, certainly predisposes the offspring to scrofula, both external and internal; and when this is associated, as it too frequently is in the lower classes, with addiction to *spirituous liquors*, the injurious influence is the more marked, particularly when the mother is thus circumstanced, and addicted during the periods of utero-gestation and of lactation. I have on numerous occasions remarked this to be amongst the most undoubted causes of strumous affections in the poor; but it is so generally associated with others about to be noticed, especially impure air, and insufficient ventilation, that it is impossible to say truly what degree of influence may be assigned to it solely. The numerical pathologists may, however, assign it a number; I therefore leave its true value to be calculated by them.

194. C. *The modes of living of the parents as to food, drink, &c.*, have been too generally disregarded in our speculations on the causes of the disorders and diseases of childhood, and of the constitutional powers and predispositions of the offspring.—a. The injurious effects of insufficient and unwholesome food, and of the frequent use of pork and pork meats, and of the blood and viscera of animals—not only on the parent, but also on the offspring; and the respective influences of a vegetable and an animal diet, have been noticed above; but the use of fish, or a purely fish diet, in-

cluding shell-fish, has not been satisfactorily investigated. In the Shetland Isles, where I resided up to the age of fifteen, and visited for short periods for several years afterwards, the labouring classes live chiefly, or rather entirely, on fish, potatoes, meal, and cabbages — the kinds of fish being the most wholesome and best,—the cod, ling, the torsk, halibut, haddock, whiting, skate, coal-fish, &c.; and these are very generally taken with the oil of the recent livers as the only sauce. Those who live in this manner are healthy, enduring, and but little subject to pulmonary consumption or to other visceral diseases. Shell-fish is more productive of cutaneous affections than the fish now mentioned; and the former is more frequently followed by other injurious effects, especially in persons of a peculiar idiosyncrasy.

195. *b. An intemperate use of spirituous liquors* has been viewed as a cause of consumption, whilst its influence in causing this malady has been denied. That it has some influence, especially when associated with other causes, may be admitted; but I believe that it has more influence upon the progeny than upon the parent. Dr. OGSTON of Aberdeen found in the lungs of 73 intemperate persons who died suddenly—42 by drowning, and the rest by accident and suicide—diseased appearances within the cranium in 89 per cent. and in the respiratory organs in 56 per cent.; several organs being affected in the same person. There were also marks of disease in the pericardium, heart, or aorta in 41 per cent.; in the stomach in 27 per cent.; in the intestines in 10 per cent.; in the abdomen 73 per cent.; in the liver in 41 per cent.; in the kidneys in 34 per cent.; and in the spleen in 14 cases. LIEBIG supposes, that the elements of alcohol combined with oxygen in the body, that its carbon and hydrogen are given off as carbonic acid and water, the oxygen existing in a free state in arterial blood, and that the oxygen of the arterial blood, instead of combining with the tissues, combines with the elements of alcohol, and the arterial blood becomes venous. He further states that the amount of carbonic acid given off by the lungs is diminished by the excessive use of alcohol while the animal heat is lowered and the strength impaired.

196. There can, however, be little doubt of *the injurious influence of the intemperance of the parents on their offspring*; and there is as little doubt that the injurious effects are mainly evinced by the scrofulous diathesis thereby generated in the children, and developed either into external and internal tuberculosis in infancy or into tubercular consumption in early or late epochs

of existence. It is difficult to say in what sex or parent this vice is most productive of these maladies in the offspring. It is, however, evident, that the female who addicts herself to the abuse of intoxicating liquors, and especially during pregnancy and lactation — and there are many both in the middle and lower classes who thus devote themselves and their infants to perdition — will bear an unhealthy foetus, or one which will be imbued with the diathesis and seeds of disease just mentioned; and, if it live so long, will communicate a similar evil to its offspring. How efficiently are our legislators providing the incentives to the destruction of health, constitution, and morals, in the licenses and encouragements furnished throughout the kingdom to the abuse of intoxicating liquors! But what are these important matters, to the higher consideration, to them, of aristocratic interest, family patronage, and the influence of party?

197. Other causes besides intemperance may so affect the mother during the child-bearing period of life, and during pregnancy and lactation, as to favour the development of a scrofulous and tubercular disease in the foetus and infant. Too low living, unwholesome meats, especially the too exclusive use of pork and bacon, anxiety of mind, and all the distressing and perturbing emotions, are more or less injurious to the offspring, and in the way just stated, more especially when conjoined with the other causes of ill health, which abound in all cold, low, humid and ill-drained localities; in crowded and ill-ventilated houses and apartments, and in crowded or close manufactories and manufacturing towns.

198. *c. The use of tobacco* in any way, either by smoking, snuffing, or chewing, is most injurious, especially in early life, and as respects its effects upon the constitution of the offspring, more particularly when either of these vices are indulged to excess by the male parent. Numerous instances have come before me of young men who have become habitual tobacco-smokers in early life, and who, having married, have either failed of having a progeny, or had children that could not be reared; or if they reached any of the early epochs of life, were subjects of tuberculosis in one or other of its forms or seats, and especially of tubercular consumption. I am convinced that the very remarkably increased use of tobacco in this country, more especially by smoking, will render scrofula in all its states, and phthisis, still more prevalent than they now are, and the inhabitants more and more stunted in growth.

ii. THE CAUSES OF TUBERCULAR CACHEXIA AND OF TUBERCULAR CONSUMPTION THAT ACT CHIEFLY IN INFANCY, CHILDHOOD, AND IN EARLY LIFE, OR PREVIOUSLY TO, OR ABOUT THE PERIOD OF PUBERTY.

199. THE causes of external and internal tuberculosis, or in other words, of the scrofulous cachexia and of tubercular phthisis, may act directly upon these classes of subjects. These causes may be in operation during infancy solely, or during later childhood, or even not until after this epoch. They are amongst the most influential causes of the distemper, especially when acting more or less in combination, as often observed respecting some of them. It is generally difficult to determine the amount of influence of each, or even of several of them, when operating either co-etaneously or in succession, particularly when the constitution presents an hereditary taint, and, in this case, those causes are the most efficient in developing this taint into open or manifest disease. The *milk* of the nurse, especially if she be circumstanced or addicted as just mentioned (§§ 190-7), or if her health be such, owing either to natural delicacy of constitution or to disease, as to render her milk insufficient, innutritious, or unhealthy, is a most influential cause of debility and disease of the infant, this disease assuming more frequently the form of internal or external scrofula than any other. In connection with the suckling of the infant, there are several causes which often concur in the production of the morbid effect; the most influential of these are the articles of food given to the infant either supplemental of the milk of the nurse, or during and after weaning, and the state of the air which the child breathes by night as well as by day.

200. A. The *food* and *drink* which are best adapted to the infant, before it has got several teeth, is the milk of a healthy mother or nurse; and in as far as a departure from this food takes place, so far will the development of scrofula and phthisis be risked. When the mother is incapable of suckling, or her milk is unhealthy or insufficient, a healthy nurse is required; and if she cannot be obtained, then the best means of feeding the infant should be adopted. In the various circumstances in which children are brought up, it is very difficult to determine the share of injury which may be imputed solely either to the nature and amount of their food, or to the state of the air which they breathe, or to the other influences which surround them. M. BENOISTON DE CHÂTAN-

NEUF states, that of infants nursed by their mothers in Paris, 18 per cent. die in the first year, and that of those suckled by strangers, 29 per cent. die in the same time. Doubtless much of this mortality is to be imputed to other causes, as to the close unhealthy air of a large city, as well as to those connected with the food of infancy. Both in towns and country districts, healthy wet-nurses cannot be obtained owing to the circumstances of the majority of those requiring them; and their artificial feeding becomes their only resource. This feeding, independently of the many unfavourable influences which concur with it, fails of furnishing an appropriate nourishment; and consequently a very large proportion of the infants who are subjected to this mode of rearing, die in their first year; and of those who live, many become the subjects of internal or external scrofula. Mr. PHILLIPS has adduced a series of statistical details, illustrating the deaths during infancy of the inmates of several infant institutions, where the children are brought up by hand; and in these the deaths in the first year appear to vary from upwards of 80 to 50 per cent. In *Lyons*, a crowded manufacturing town, where the infants are suckled, the mortality in the first year was 33 per cent.; the ordinary mortality at Lyons during the first year being about 20 per cent. In the London Foundling Hospital, where the children are provided with wet-nurses, the deaths are 22 per cent. during the first five years, and of these 10 per cent. only die during the first year; but it should be recollected that a child is rarely admitted before the third month, and that it is during the first three months of life that the mortality is greatest. In large manufacturing towns and cities the number of infants reared by hand is greatest, and the deaths are also much the greatest; and the proportion of the survivors that become consumptive and scrofulous is also the greatest. In London, the number of infants thus reared who die during the first year is three or four times as many as those who die from among those similarly reared in the country.

201. Whilst very much of the mortality, and of the disease of the survivors, of those reared by hand, is to be imputed to this cause, much also should be referred to the kind of food which is substituted for the milk of the mother, to the air which the infant breathes, and to the other circumstances by which it is surrounded. As respects the *kind of food* which is thus substituted, it may be stated that, in manufacturing towns, where the married women

employed in the factories rear their infants by hand, little attention is paid to the nature of the food, and few of the children survive the first or second year, most of the survivors becoming tuberculous or scrofulous. There are two things to be noticed in respect of children thus circumstanced, viz., the nature of the food and the manner of taking it. The food, even if it be milk, instead of being drawn directly from the mother, has probably been obtained some time before from a purely herbivorous animal—the cow, between the milk of which and that of human milk there is a very considerable difference, that of the former containing more than twice as much caseine, and much less butter and sugar of milk. Moreover, in towns the milk of cows is often unwholesome, especially to infants, owing to the confinement of, and modes of feeding, these animals, and not unfrequently to tubercular disease developed in them by these causes. The mode also of taking the food exercises an important influence on the health of the infant. By the act of sucking, a certain quantity of saliva is pressed into the mouth, and is mixed with the milk so as to render its digestion easier. Indeed, this is essential to good digestion in infants. Moreover, the act of sucking is an exertion which can be made only for a certain time, and hence over-distension of the stomach is prevented; whilst, when fed by hand, the risk of over-feeding is often run, by the anxiety of the nurse, and harm from this is not infrequent.

202. In the greatest number of instances, instead of milk, gruel with a little milk, sopped bread, or flour, or other farinaceous substances are used. This food is assimilated with difficulty, and readily gives rise to acidity, flatulence, and irritation of the digestive mucous surface, with all the consequent evils of insufficient secretion and excretion and impaired nutrition. Mr. PHILLIPS justly remarks, that these evils are made evident by the following facts:—"In Lancashire and the West Riding of York, the deaths in the first year of life are to the total deaths as 1 to 3·9; while in Devon and Wilts, they are 1 to 6·4! Now it is in the great factory towns which are found in Lancashire, Cheshire, and Yorkshire, that the system of bringing up the child by hand is most commonly practised, and where its evils are most apparent; first, in the great destruction of infant life, and failing that, in the development of tuberculated lungs and other states of tuberculosis." But the mothers are not solely the guilty parties. The fathers are often so drunken and dissolute as to provide little or no food for their families, and the mothers are therefore obliged to be employed in the factories to provide for the wants of their children, entertaining at the same

time but little desire to add to their number, or to devote much care on those which require it the most.

203. The digestion of infants is rapid, and as the quantity of food taken at a time is small, it is necessary that, during the first month, the interval of feeding should not exceed from one and a half to three hours. If, in addition to inappropriate food, the intervals between the periods of administering it be much more prolonged, as it often is in manufacturing towns, the evils must be so much the greater. Mr. PHILLIPS states, that in the large factory towns, the deaths from tuberculous and scrofulous diseases are as 1 to 31 of the total deaths during the first year of life, whilst in the metropolis they are as 1 to 42. During the whole of life, they are 1 to 5·6 in the factory districts, and 1 to 6·4 in the metropolis. According to the experience of Friendly Societies, he adds, the expectation of life in rural districts, at 30, is 38·4 years, and in cities 32·8 years. Of the total population living at the age of ten, one half will have disappeared in cities before the age of 62, and in towns before 65; whilst in rural districts half the population will attain nearly 69 years. The greater longevity of the latter, or the less prevalence of scrofula, is not to be imputed to the food only, even granting this be more nutritious and more appropriate, for the former may possess the greater advantages in this respect; but to the air, ventilation, exercise, &c., enjoyed by those residing in country districts.

Dr. BARON HOWARD gives a just but melancholy description of the character of many of the operatives in large towns. "A large proportion of those who regularly receive high wages are constantly in a state of the greatest poverty, and often bordering on actual starvation; their houses are almost destitute of furniture, comfortless, and uncleanly; too often damp, cold, and ill-ventilated. Their families are ill-fed, scantily clothed, and badly lodged. They live much on innutritious and indigestible food, and often use articles of bad quality, or such as are rendered unwholesome by adulteration, or by being kept too long. They are extremely intemperate in their habits, and instead of purchasing wholesome food and proper clothing, the greater part of their wages is often expended by anticipation at the public house. The effect of the intoxicating liquids they consume is of course to produce a temporary excitement of the whole system, which is succeeded by a corresponding depression; they lose all relish for plain nutritious food, and their appetites can be stimulated only by something savoury

and piquant. This kind of diet does not afford sufficient nourishment to repair the losses the body is continually sustaining; great languor and debility are the consequences; for the removal of which stimulants are again had recourse to, and thus an alternately excited and depressed state of the system is kept up. By this mode of life too, the digestive organs become impaired, and the function of digestion is so feebly and imperfectly performed, that even much less nutrition is extracted from the indigestible and impoverished diet they use, than would be the case if the digestive organs were in a healthy condition." This writer adds, that "scrofula in all its varied forms may be mentioned as one of the commonest diseases prevalent among the destitute poor, and which frequently originate in deficiency of food." There can be no doubt of the justness of the conclusion at which Mr. PHILLIPS arrives from his researches, namely: "That in Great Britain scrofula is least prevalent where children and others are best fed; and although I by no means assume that the immunity is entirely owing to better feeding, because where much attention is bestowed on the food, it is hardly likely that other means of maintaining health will be neglected; yet I would submit as a fair deduction from the foregoing evidence, that food exercises a more important influence than any other agent in the production of scrofula."—(*Op. cit.* p. 175.)

204. (a.) *What influence has particular kinds of food in causing scrofula and tubercular consumption.*—This question has been differently, but not satisfactorily answered. Several articles of diet have been accused of producing this effect, and to certain of these I have adverted above (§ 192). HALLER was amongst the first to mention the opinion of the prevalence of this distemper being caused by the use of potatoes. The use of these, as the staple article of food in Ireland, where scrofula is more prevalent, and the duration of life is less than in England, tends to show that they may be concerned in producing these effects; but it ought not to be overlooked that they afford insufficient nourishment, and that there are other causes in operation. Mr. PHILLIPS believes that those who live almost exclusively on vegetable food in this country are less robust, and exhibit a greater tendency to scrofula, than those who subsist on an admixture of animal and vegetable food; and he considers, that our own rural population, as well as that of Scotland and Ireland, bear out the assertion. "But, although it has been shown that insufficient and improper food, however associated, may lay a foundation for that disease, we have, in truth,

no conclusive proof that any particular article of food directly tends to the production of scrofula."

205. (b.) The *drink* or *beverage* used by infants and children has no mean influence in favouring the development of scrofula, and of tubercles at a more advanced age. Among the lower classes, especially in large and manufacturing towns, the frequent recourse to anodynes and carminatives, containing narcotics, sedatives, &c., in order to procure sleep or quiet for infants and young children, and to allay their wants, cravings of appetite, and irritations of temper, is of itself no mean cause of their weakness of constitution, of imperfect development of both mind and body, of scrofulous and tubercular formations, and of various other diseases, as they advance to puberty and manhood. The not infrequent practice, amongst the lowest and most abandoned classes, of giving spirituous and other intoxicating liquors to their children—of causing their infant offspring to partake of the noxious beverages in which they are themselves indulging, is productive of effects, in the innocent victims, of the kind just stated. The vices of the parent are, in the present state of society, not merely passively propagated in the offspring—to even the third and fourth generation; but are not infrequently most actively and feloniously extended, at the most tender and helpless periods of existence, to those for whom the ties of nature should be most intimate and indissoluble.

206. B. Next in importance to this source, is the *congregation of numbers in a close or insufficiently ventilated place*, more especially in a close sleeping apartment.—a. Amongst the most prevalent causes of scrofula and tubercles, especially in the present state of society and manners, there are perhaps none more influential than congregating children and young persons in boarding and large schools, where they are often scantily fed, and through the greater part of the day restricted in air and exercise,—confined in a school-room, often insufficiently or improperly warmed, and imperfectly ventilated, in order to economise fuel,—subjected to premature mental exertion, or to cramming modes of instruction,—and packed into sleeping apartments insufficiently ventilated and much too small for the number confined in them. It is a common practice in boarding schools in large towns to put from six to twenty children or young persons in the same sleeping apartment; and the parents are, from ignorance, or the delusion of having a bed assigned to each, contented with the arrangement. Many such apartments even have not, during night, any ventilation, excepting what takes place by the fireplace, both the doors and windows being closed;

and so foul does the air become by the morning, that it is sickening to a healthy person entering the chamber, so completely is it loaded with the emanations resulting from the insensible and sensible perspiration, and from having been repeatedly respired.

207. *b. The temperature and ventilation of sleeping apartments.*—A too low range of temperature in sleeping apartments in this and many other temperate countries, especially in the winter and spring months has no mean influence in favouring the development of consumption. It is not unusual to find in the bedroom the thermometer in these months ranging from 55° to 35° during the night, owing to the neglect of fires in these apartments, whilst the sitting and reception rooms have the temperature kept up to 60° , 65° , or even 70° . Thus the circulation in the lungs and the vital endowment of this organ are subjected to the influence of a greatly depressed temperature at a period when the lungs and their functions are least able to endure this depressing influence with impunity. The neglect of due *ventilation*, or of a requisite renewal of air in the sleeping apartment, is another influential cause of phthisis. The same atmosphere is thus repeatedly inhaled and proportionally contaminated. Not infrequently the great coldness of the sleeping room leads to the adoption of means which prevent ventilation. Even independently of the temperature, every sleeping apartment should be provided with an open chimney, and when this is wanting the door should always be open during the night. Insufficient ventilation of a sleeping room, and the use of curtains around the bed, favour the contamination of the air, and prevent the due oxygenation and depuration of the blood in the lungs.

208. This *self-contamination* of the air is often only supplemental of the contaminations derived from other sources, especially from such as have been just mentioned; and which, although injurious in many private seminaries, are even still more so in many large institutions and charities, owing to the congregation of greater numbers, particularly in sleeping apartments, to ill-regulated dietables, to insufficient exercise in the open air, at a period of life which requires air and exercise for the healthy development of the frame, and to the over-exertion of the mind to the neglect of healthy pastimes and amusements. This cause is especially productive of the more internal forms of scrofula, and particularly of tubercles of the lungs; and is the more influential as being in continued operation during the periods of the growth and development of the frame. These congregations of young persons, especially during the age of

puberty,—at the period of sexual evolution, when instinctive impulses are too strong for the control of the weakly-exerted dictates of reason, often lead to practices which tend—and tend more than any other cause, especially at such early periods of life—to exhaust the powers of life, to impair and vitiate nutrition, and to favour the production of the several forms of the distemper now being considered. This mode of life, at this early age, as well as several others to which the lowest and even the highest, are often subjected—the one from misery and necessity, the other from ignorance, vanity, and excessive care,—is not infrequently rendered still more injurious by the want of due exposure to the sun and air.

209. *Exhalations from privies, cesspools, drains, and sewers*, especially in large institutions, manufactories, and towns, occasion this as well as other states of constitutional disease; and to these are often added the emanations from burying-places. Amongst the poor, the influence of cold, often conjoined with humidity, and with overcrowding and insufficient ventilation; the exhalations from the soil, and from the animal and vegetable matters which are undergoing decomposition in or upon the soil; living in damp cold cellars and apartments on the ground floor, insufficiently drained and ventilated; and want of light and sunshine, are causes which aid the operation of hereditary predisposition, and of deficient or improper food.

210. *Of the influence of vaccination and of small-pox on tubercular phthisis.*—An important question is raised by RILLIET and BARTHEZ with reference to the influence of small-pox and scrofula. DE HAEN and ROWLEY were of opinion that the inoculation of small-pox had a tendency to excite in the system the development of scrofula; while RILLIET and BARTHEZ state, that in any of the variolous cases they have observed, the eruptive fever has not been terminated by tuberculation. They believe it to be proved that small-pox and tubercular disease are of different natures and mutually repel each other; that since the use of vaccination tubercular diseases had become more frequent; that those children who die without having had small-pox are more frequently tubercular than otherwise; and that of those vaccinated a greater number are disposed to tubercles than of those who have not been vaccinated. They, however, guard themselves from assigning vaccination as a cause of tubercles; all they have been able to observe is, that a greater number of vaccinated children die with than without tubercles. The only precise evidence they furnish for the opinion is the following:—“Of 208 vaccinated children, 138 died tubercular,

70 non-tubercular. Of 95 children who died without having been vaccinated, 30 were tubercular, 65 not so."—(p. 149.)

These results certainly agree with my own observations, and confirm an opinion I have long entertained respecting the comparative effects of vaccination and small-pox upon the prevalence of scrofula. The scrofulous and tubercular matter may become partially resolved and absorbed, the cretaceous or mineral parts of the deposit only remaining, has been proved to take place, but the exact circumstances in which it does take place have been very insufficiently ascertained. RILLIET and BARTHEZ believe that small-pox more especially, scarlatina and typhoid fever, tend to favour this resolution. That scrofulous and tubercular affections have increased since the introduction of vaccination is undoubted; and that the dangers from the inoculation of small-pox, under due management and care, in preventing the occurrence of the non-inoculated disease, were actually few, although remarkably exaggerated, are also certain. But, granting that vaccination favours the prevalence of the several forms of scrofula, it is not evident how this result is produced. Can it be occasioned by the inoculation of a virus, which, although productive of a local effect, causes a certain taint of the constitution, which is not prevented, or removed, by its elimination in the form of pustules on the external surface? According to this view, vaccination may be, in many instances, the introduction of a poison or virus, which slowly and silently contaminates the frame, without being matured and thrown out on the surface; whilst small-pox has a very different effect, owing to the free suppuration of the pustules and the elimination thereby of the morbid material or virus from the system.

211. There are other causes or circumstances influencing the constitution of young persons which have been viewed by some and denied by others, to be concerned in the production of scrofula. That confinement in prisons, in poorhouses, in asylums, in charitable institutions for education or reformation, in factories, &c., will occasion some form or other of scrofula, more especially tubercular deposits in the lungs and other internal organs, cannot be gainsaid with truth, although this morbid effect may be manifested in so few as to almost justify the denial of its existence, especially where a sufficiency of wholesome food, exercise in the open air, due light, ventilation, and sunshine are enjoyed. But where these are more or less wanting, and especially where there is over-crowding, particularly in sleeping chambers; low

ranges of temperature, conjoined with dampness; contaminated states of the air; depression of spirits or anxiety of mind, &c., the morbid effects will soon become manifest, and frequently in the forms constituting those now under consideration. Most of the causes already considered have been numerically and satisfactorily investigated by Mr. PHILLIPS, who has thrown much light upon several of them; but, in the extended sense in which I have viewed the subject,—not solely with reference to external scrofula, nor to childhood, but with regard to both the external and internal distemper, more particularly to tubercular phthisis, as observed at all periods of life,—I believe that several causes, which he views as possessed of little or no influence, are actually deserving of more consideration and elucidation than they have hitherto received. There can be no doubt that, in the several circumstances just enumerated, and in the different classes, positions, and employments of life, certain causes are more influential in some of these than in others—in one class or occupation than in the rest; and that, where several causes are in simultaneous action, it is difficult to estimate the relative value of each; but, nevertheless, whatever cause has the effect of lowering the powers of life, of impairing assimilation, nutrition, and strength, will, in a considerable proportion of those thus affected, give rise to tuberculous deposits, particularly if an hereditary predisposition or constitution already exists, and will reinforce or determine the action of other agents in developing this mischief.

iii. OTHER CAUSES CONCURRING IN THE PRODUCTION OF THE SCROFULOUS TAINT, AND AIDING OR DETERMINING THE DEVELOPMENT OF TUBERCULAR CONSUMPTION.

212. *The causes* which have been already insisted upon are certainly the most influential in the production of latent and developed scrofula and tubercles; *but there are others* which concur with the foregoing either in producing a scrofulous taint, or external scrofula merely, or in developing internal tubercles, especially in the lungs, in persons who are already imbued with this taint, and which, when acting energetically, may produce this effect even on those who are not manifestly thus imbued. In this latter case, the causes in question, acting either independently of the foregoing causes, or conjointly with them, or aiding and determining their effects, impair not only the vital energy and vital functions throughout the frame, but also the nutrition of the

several tissues, and the intimate condition of vital cohesion and action. Many young persons, possessed of a scrofulous diathesis, or who have been the subjects of external strumous disease in childhood, and even some who present no very marked sign of a scrofulous taint, become, as puberty, or early manhood, or more mature age is arrived at, the victims of tubercular formations in some internal organ, especially in the lungs, owing to the operation of those causes, which I am now about briefly to consider.

213. *A. Neglect of exercise in the open air*—of exposure to the light of day and to sunshine—is one of the causes which is most influential in superinducing tubercular formations in the scrofulous diathesis, and even in constitutions which evince no evidence of this taint. The general neglect of the indications suggested by the alternations of night and day—the neglect of repose during the hours of darkness, and of rising and of being employed during the hours of day—the common practice of pursuing our avocations and recreations during a large portion of the time intended by nature for our repose, and of devoting a large portion of the day to sleep, is not without influence in impairing the constitutional powers, in weakening the assimilating and excreting functions, and in relaxing the mental vigour. An early departure to nocturnal repose, and the limitation of this repose to the hours of darkness—the trite maxim of “early to bed and early to rise,” &c., is of much greater importance than is indicated by the practice of modern times.

214. *B. Inattention to a due preservation of the cutaneous function* is not without its influence. The imperfect performance of this function, the sudden arrest of it, or the entire suppression of it, however well it may be vicariously discharged by the lungs, kidneys, or intestinal canal, endangers the healthy condition of the blood, and disorders the assimilating processes. It should not be overlooked, in our pathological speculations, that the cutaneous function is supplemental of other important functions—of the respiratory, of the renal, of the hepatic, and of the intestinal,—and that, even when no supplemental or vicarious office may be traced to this function, or to either of these other functions, a very intimate relation subsists between them, the due discharge of the one influencing the others more or less. The importance, therefore, of duly regulating this function, guarding against its excess as well as its suppression, by proper clothing and exercise, will be admitted.

Among the *dark-skinned races*, a free and even an abundant cutaneous perspiration is most necessary to the continuance of

health; and when it is habitually diminished, especially by migrating to a colder climate, tubercles, especially in the lungs, supervene in very numerous instances. A diminution of the accustomed perspiration may not, however, be the sole cause of this liability of the Negro and other dark races to tubercles after migrating to temperate or cold climates. The sedative influence of cold upon the constitution of these races may have a considerable or chief share in the production of this effect, especially in connection with the obvious want of adaptation of the constitution of these races to temperate and cold climates. Of the *influence of climate* generally upon the prevalence of scrofulous and tubercular diseases no precise data exist. The subject, however, will be adverted to in the sequel, and with stricter reference to Tubercular Consumption.

215. *C.* Intimately connected with the foregoing is *the influence of dress and of various physical conditions depending on occupations and habits of life.* Exposure of parts of the frame requiring protection or uniformity of temperature, as the upper regions of the chest, and the hips and lower extremities, to vicissitudes of season and weather, and sleeping in too low a range of temperature, are injurious, the effects being more frequently manifested in the lungs than in any other organ. To restrain habitually the movements of the thoracic and abdominal parietes, by position, by occupation, or by dress, or to otherwise embarrass the function of respiration, is much more injurious than is generally considered. The stooping position, particularly when long continued, or frequent; stooping at a low desk or table, especially if a part of the parietes of the chest is brought in contact with, or rests upon, the desk; and, above all, stiff and closely laced stays or corsets, are amongst the most injurious agents to which youth or mature age can be subjected, and their effects are most frequently manifested by favouring the development of tubercles.

Stiff or unyielding stays prevent the due exercise of the muscles of the trunk, impair their development in early life, and weaken these muscles at later periods. If this article of dress be too closely applied or drawn around the waist, the movements of the ribs are restrained or even prevented; the liver is carried upwards, and it invades the thoracic cavity, compressing the lungs and embarrassing the circulation through the heart and large vessels; and the colon is more or less displaced, or pressed upon, with the rest of the abdominal viscera. The undoubted consequences of these conditions — consequences, which vary in amount and danger

with the cause now assigned — are an imperfect performance of the respiratory, of the digestive, of the assimilating, and of the excreting functions; and ultimately a morbid state of the blood, tubercular depositions, especially in the lungs, hæmoptysis, anæmia, &c.

Not less injurious than tight lacing is the practice of wearing unyielding supports in the stays, especially steel supports, which, however well covered, tend to carry the electro-motive influence from the frame, and to withdraw a salutary stimulus of nervous power from the system. The importance of attention to this matter is not hypothetical, but real, as proved by long and frequent observation, and by the results following the removal of this evil. The more freely the movements of the trunk and spine are allowed to be performed, and the more efficiently the actions of the muscles concerned in these movements are accomplished, the more certainly and healthily will the functions of the several organs contained in the trunk be discharged.

216. *D. Excessive secretion*, and more especially an excess of the recrementitious secretions, or an undue discharge of the latter, contrary to the intentions and indications of nature, and particularly the unnatural and debasing vice of *manustupration* — a vice most generally practised by prudes, the unmarried, and the sanctimonious — have no mean influence in the production of tuberculosis, especially of the lungs, even independently of the pre-existence of a scrofulous diathesis. The vice now adverted to, and a premature or excessive sexual intercourse, are injurious, both by the discharge from the œconomy of a secretion intended to aid the healthy development of the frame, and afterwards to support and to promote the nervous and other functions, and by the frequent and excessive excitement, by which this discharge is preceded, a consequent state of languor, depression, and vital exhaustion always resulting.

217. *E. Sleeping with very old and debilitated persons* is certainly prejudicial to the healthy, both in predisposing to tubercular consumption, and determining or developing the disease in those predisposed by a scrofulous diathesis or other influences. It may also be associated with other causes, and the results become more immediate and severe.

218. *F. Infection.* — *Emanations from the lungs and skin of persons, in the second or third stages of phthisis especially*, are certainly sometimes productive of consumption, more particularly in young persons of a scrofulous diathesis, and in those who are predisposed by other causes, or who are subjected to several concurring influences. The inhalation by the healthy of the emanations

from the lungs and skin of the consumptive, and the consequent appearance of the disease in the former, may, as in other cases of infection, be productive of its injurious effects only in the circumstances now stated, but the disease is caused by infection nevertheless, although the fact is stated loosely by many writers as one of the propagation of phthisis by contagion, and denied by others, as indeed the infectious nature of nearly every disease has been denied by some, who consider belief in infection to be credulity, and scepticism to be a proof of a "strong-minded" physician, or rather of an incredulous old woman. Although phthisis, in the circumstances favourable to infection, may be communicated to others, especially when the healthy sleep in the same bed or apartment with the sick, and although this result is, perhaps, more likely to occur in persons under or about the period of puberty than at a much more advanced age, yet for many years after puberty the person thus exposed and predisposed may be attacked; and this result is the more likely to take place in the cases of married, especially recently married, persons. I state this as the result of my observation; and although the matter has been discussed from the days of GALEN, and the occasional transmission of the disease by infection believed by him, by RIVERIUS, MORTON, VAN SWIETEN, NARDUCCI, RONCALLI, CHAVET, J. FRANK, HUFELAND, HILDENBRAND, and many others, and denied by SALMADE, CASTALLANI, PORTAL, and numerous other writers, it still remains in dispute.

219. *G. Employments, exercises, amusements, and regimen previously to puberty.*—Sedentary employments, irksome occupations, and confinement in close or dark apartments, are more or less influential in predisposing to, or more directly occasioning, tubercular phthisis. The deprivation of out-door exercises and amusements, so requisite at this period of life to the development and strength of the constitution, and the congregation and confinement of numbers, in ill-ventilated factories, houses or sleeping-apartments, blight the vital endowments of the frame; and of all the structures and organs, the lungs, like the leaves of a plant—both being the respiratory organs of their respective bodies—are the first to experience, and the most disposed to sustain injury. The respiration of foul air contaminates the blood, especially during the circulation through the lungs, and prevents the requisite discharge of carbon and other impurities, and the due depuration of this fluid, thereby favouring the deposit of tubercles in the lungs and other parts of the body. Children and young subjects living in low, damp and badly lighted cellars, more especially those confined

in these localities and devoted to sedentary occupations become the subjects of scrofula, and tuberculosis in all their forms and manifestations, and if to these causes, insufficient food and clothing be added, the effects are proportionately exasperated. Nor are dress, night and day clothing, the influence of light, sunshine and temperature, at this period of life, undeserving attention as respects both sexes; for although either of these singly may appear of little importance, yet operating, as they often do, in combination, their effects on the general organisation are often remarkable. The frequent practice of leaving portions of the body uncovered by the dress, without reference to the weather and season, during the early periods of life; the very low temperature of sleeping apartments during the winter season, in this and some other countries, whilst the confinement of the air by closely drawn curtains around the beds causes the repeated respiration and consequent contamination of the air, thereby inducing feverish, restless and unrefreshing sleep, and a contaminated state of the blood, are amongst the most influential occasions of an imperfect development of the body at a period of life when all the aids to health and strength are most especially required. Not infrequently also other agencies are brought in co-operation with those just mentioned, and these too of no mean influence. Deprivation of light and sunshine—of the salutary influence of the sun's rays on the frame—not infrequently, especially when aided by the causes already noticed, produces an etiolation similar to that occasioned by this cause in plants; and, although the body grows in height, and the vessels extend in the direction of their axes, as in plants, yet the various structures are loosely, weakly and insufficiently formed, each one being deficient in tone, firmness and vital cohesion. Associated with this state of imperfect organisation, the blood presents a similar defect of assimilation, and an arrested development of the red-globules. It is thin, watery, and, although it may abound in colourless globules, or in those not yet metamorphosed into red globules, these last are very much diminished in number, or in their usual proportions. Nor should the mental depression, the irksomeness, the weariness of both body and mind, occasioned by the circumstances noticed under this category, and their effects upon the youthful constitution, be overlooked. These circumstances, when acting either singly, but protractedly, or in various combinations, exert their injurious influence primarily, although not always manifestly, on the lungs. These organs, although generally the first to suffer, are not always the first to indicate disorder. The functions of digestion, assimila-

tion and nutrition often furnish the earliest indications of disease to the casual or superficial observer, but the experienced eye, and the informed mind, detect the antecedents of these, and carry the analysis of the morbid phenomena much farther, and until the agencies producing them are fully disclosed.

IV. CAUSES OPERATING DURING AND SUBSEQUENTLY TO PUBERTY.

220. *A.* It is manifest that when the mental *studies* of the upper and middle classes of society, at this period of life, are pursued too far, or to the neglect of those amusements and exercises requisite to health, and to the proper development of the frame, pulmonary consumption will follow in a large proportion of cases, especially when the constitution is predisposed by original conformation, by the strumous diathesis, or by other causes acting in earlier life, or concurrently with this. If these studies are rendered still more injurious by stooping positions, or by pressure of the side against a desk, whereby the actions of the respiratory apparatus are hampered or confined within too narrow limits, the injurious effects will be more certain. But, where these latter causes are not present, others equally injurious may operate; and these may either be too close cinctures of the lower regions of the chest, the pressure of unyielding, or insufficiently yielding supports in the stays worn by females; the use of steel supports, which conduct the electricity of the frame from the body into the air, and thereby deprive the nervous system of a salutary stimulus; and insufficient clothing on the neck, upper regions of the chest, and shoulders, or even the complete exposure of these parts without any clothing whatever, are not without their influence, either as exciting or concurrent causes, especially where a predisposition to this disease already exists.

221. *B.* *Trades, employments, and conditions of life* are conducive to pulmonary consumption when they prevent exercise in the open air; when they are followed in cold, low, close, humid, and dark apartments or situations, or in confined, bent, or cramped positions of the body, as by miners, &c. As to the comparative liability of persons pursuing different trades and occupations, no precise information has been furnished, as the number of persons occupied in each of these trades, in connection with the number attacked with phthisis, can rarely be obtained. It is manifest, however, from the researches of Drs. GUY and LOMBARD, that the

deaths from this disease in those who followed in-door occupations are about double the deaths of those who pursue out-door employments. Shoemakers, tailors, milliners and dressmakers and other needlewomen, clerks and shopmen, weavers and glovers, compositors and printers, servants, bakers, &c., are amongst the trades most liable to phthisis. BEDDOES stated that butchers are less liable to this malady than those following any other employment, and later observations have confirmed the statement. Dr. TROTTER made a similar remark in favour of sailors, and this is rendered more obvious by the more liberal diet allowed to them now than formerly. Dr. WITHERING considered stable-boys, grooms, post-boys, and dragoons, less liable to phthisis than other employments, and such appears upon the whole, to be the case.

The occupations in which dust and other irritating particles, whether mineral or vegetable, are inhaled into the lungs are especially productive of diseases of these organs, and particularly of pulmonary consumption, bronchitis, asthma, and various complications of these, either with one another or with other lesions. The artisans and labourers most liable to consumption from the inhalation of mineral, metallic, vegetable and animal molecules, are stone-cutters, sculptors, quarriers and miners, more especially the cutters of millstones, sandstones, &c.; dry-grinders, and needle-pointers, edge-tool, gun-barrel and other grinders; flax-dressers, wool-carders, and feather-dressers; iron, brass and other metal filers; sawyers, turners, weavers, and starch-makers; pearl and horn button makers, millers and bakers, &c. All these suffer more or less—needle-pointers, dry-grinders, and millstone makers the most, and starch-makers the least. The form of pulmonary and respiratory disease thus produced varies with the predisposition, diathesis and other circumstances of the case; but the most frequent maladies are tubercular and laryngeal consumptions, chronic bronchitis, chronic inflammations and emphysema of the lungs, asthma, &c. The tubercular and more inflammatory affections, most frequently result from needle-pointing, dry-grinding, and stone-cutting; and very few persons who are thus employed live longer than 35 years, especially if they have been thus occupied from an early period of life. In most of these cases, the symptoms and appearances after death differ but little from the same diseases arising from other causes.

222. *C. The instinctive emotions and desires* are more important causes of tubercular phthisis than is generally supposed by either medical men or others; and this category of causes is most

influential in young persons of a scrofulous diathesis, and in those who are otherwise predisposed, more especially by the causes already mentioned.—*a.* Premature or excessive sexual desires and indulgences, and still more the crime of self-pollution, are the chief of the class of causes in producing tubercular phthisis, and several other maladies. This crime, for it is no less than a crime, and one most severely, but not unjustly, punished by the Mosaic law when detected, is one more frequently practised by both sexes than may be believed by those who have not had occasion to inquire into the matter; and it is most prevalent in those who are sanctimonious and pharisaically censorious of others. The injurious effects of this crime are probably greater in the male than in the female, especially in causing tubercular phthisis; and it is not improbable that the rite of circumcision among the Jews was instituted partly with the intention of preventing the excitement to the commission of it, that is liable to occur in the uncircumcised. Various mechanical contrivances for the prevention of the vice in females were employed from very early ages, and several of these adopted in the middle ages may be seen in museums of antiquities. No more certain means of exciting females to this vice can be supposed than riding. Instances have come directly to my knowledge of females having relinquished horseback exercise entirely on this account.

223. *b. Celibacy* may be viewed as a cause of tubercular phthisis, although the reason of its being a cause may not be obvious to many. It is, however, more generally known that the average duration of the life of bachelors is much under that of married men. This is mainly owing to the circumstance of their having become addicted to the vice of masturbation. A very large proportion of those who are thus addicted are impotent, and many of them are conscious of this fact, and do not marry; whilst others continue this vice in preference to sexual congress, and often pay the penalty by inducing this or other diseases. Several instances have occurred in my practice of persons having admitted, when afflicted with phthisis, or with any other of the maladies entailed by this vice, that they were conscious of the cause only when too late, and often when their minds and the powers of volition were too much weakened to resist the impulse to its commission. Even married men who had become addicted to it previously to marriage have continued it subsequently, as they have themselves confessed to me in several instances.

224. *D. Mental exertion and the moral emotions.*—*a.* Mental

exertion, especially when prolonged or intense, is more frequently a concurring than an exciting cause, unless where an original or acquired predisposition to phthisis already exists. It is injurious chiefly about or soon after the period of puberty, when the frame, in all its parts, is not fully developed and consolidated, and when exercise in the open air, and in light and sunshine, which it often prevents, and which is requisite to perfect bodily organisation is neglected. This cause is often also heightened by the position of the body, especially by the stooping position, which during mental application is often too long retained.

225. *b.* The depressing emotions and affections, anxiety, longings after the objects of affection, either absent or lost, disappointments, losses of fortune or friends, &c., severely depress the organic or vital influence, impair digestion and assimilation, and predispose to, if they do not actually occasion, this malady. *c.* Under this category may also be placed nostalgia in its various longings for early abodes, scenes and objects, and for the society of early or beloved friends.

V. CONTINGENT AND ASSOCIATED INFLUENCES OR CIRCUMSTANCES AIDING OR CONCURRING IN OCCASIONING PHTHISIS.

226. *A. Sex.* — According to the Registrar-General's returns, the deaths during two years and a half (1837, 8, and 9) in England and Wales from phthisis were 146,338, being 69,009 males and 77,329 females; and in 1847 the deaths from this disease were 25,083 males and 28,234 females. Mr. ANCELL says, that "from the Irish Reports, it appears that of 135,590 deaths from phthisis, 63,935 were males, and 71,955 females. In London, however, and in the large manufacturing towns, the proportion of deaths from phthisis in males and females was different. In London, from 1843 to 1846, the deaths were greater in males than in females, by nearly six per cent. According to the returns of 1847, the deaths from scrofula, tabes mesenterica, and hydrocephalus were 8105 in males and 6542 in females; and from phthisis 25,083 males and 28,234 females, thereby showing that, whilst the former scrofulous diseases were more fatal in males than in females, the latter, or phthisis, was more fatal in females by nearly six per cent. (5.9). In this country, therefore, it appears that females are slightly more liable to consumption than males. In the Metropolitan

district, however, the deaths in 1838 from phthisis were 4057 males and 3630 females; and in 1839, 3749 males and 3355 females. The deaths in this district, in 1838, from phthisis, were 7687, whilst in the southern counties, the population of which is somewhat greater, they were 5805. The subjoined tables from the Registrar-General contain more recent results. (See Tables I. and II.)

No. I.

Deaths in London from all causes, and at all ages, and from Phthisis, from 1853 to 1857, inclusive.

Years.	Deaths in London from all causes, and at all ages.			Deaths in London from Phthisis.			Proportion of		Proportion of
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Both sexes.
1853	30,852	29,217	60,069	3989	3404	7393	1 in 7·8	1 in 8·58	1 in 8·2
1854	37,151	36,546	73,697	3914	3340	7254	1 in 9·5	1 in 10·9	1 in 10·2
1855	31,354	30,588	61,942	4070	3586	7656	1 in 7·7	1 in 8·5	1 in 8·15
1856	29,076	28,198	57,274	3810	3484	7294	1 in 7·6	1 in 8·1	1 in 7·85
1857	29,769	29,384	59,153	3970	3399	7369	1 in 7·5	1 in 8·64	1 in 8·07

No. II.

Deaths in England from all causes, and from Phthisis, from 1853 to 1857, inclusive.

Years.	Deaths in England from all causes, and at all ages.			Deaths in England from Phthisis at all ages.			Proportion of		Proportion of
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Both sexes.
1853	214,720	206,377	421,097	25,955	28,963	54,918	1 in 8·3	1 in 7·1	1 in 7·6
1854	222,422	215,483	437,905	24,206	27,078	51,284	1 in 9·2	1 in 7·9	1 in 8·55
1855	216,587	209,116	425,703	24,602	27,688	52,290	1 in 8·8	1 in 7·5	1 in 8·15
1856	198,875	191,631	390,506	23,016	25,934	48,950	1 in 8·6	1 in 7·4	1 in 8
1857	212,356	207,459	419,815	23,354	26,752	50,106	1 in 9·1	1 in 7·7	1 in 8·4

227. *B. Age.*—The several tubercular maladies present a greater or less frequency of occurrence at one epoch of life than at another. Tubercular meningitis and hydrocephalus are most frequent during infancy; mesenteric decline in early childhood, or about the period of weaning; external scrofula from the period of weaning till puberty; and phthisis from puberty until advanced age. The following abstract from the returns for 1845 and 1846 will show the deaths from phthisis, *in London*, at successive epochs of life:—

Years of Age.	Mortality from Phthisis at successive Epochs.			
	Males.		Females.	
	In 1845.	In 1846.	In 1845.	In 1846.
Under 5 years	354	234	316	269
5—10	88	88	114	92
10—15	59	61	107	104
15—20	191	219	214	228
20—25	343	387	349	362
25—30	405	450	426	434
30—35	436	456	379	383
35—40	431	454	328	401
40—45	379	397	279	305
45—50	312	346	218	211
50—55	240	234	133	135
55—60	155	179	97	99
60—65	111	104	72	60
65—70	73	66	46	48
70—75	21	36	15	15
75—80	9	14	9	6
80—85	4	1	1	3

228. In 1845 the deaths from phthisis *in London* at all ages, were 3624 males, and 3107 females; and from all causes, at all ages, 24,496 males, and 23,836 females; the deaths from phthisis being in both sexes 6731, and from all causes 48,332. In 1846 the deaths at all ages from phthisis were 3729 males, and 3161 females; and the deaths from all causes, at all ages, were 24,941 males, and 24,148 females; the deaths from phthisis, in both sexes, being 6890, and from all causes 49,089. From these returns it appears that the proportion of deaths from phthisis among persons advanced in age, the number of persons thus advanced being considered, continues great to very mature age.

229. The following table is an abstract from a more extended one by Mr. ANCELL, which he has made from the Registrar General's returns for 1847, in which the deaths by phthisis, in all *England and Wales* at the several epochs of life, are stated and compared with the mortality by all causes, and with the number of persons living of the specified age in the middle of that year.

Years of Age.	Mortality from Phthisis.			Mortality from all Causes.			Estimated Population of that Age in 1847.		
	Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.
Under 1	1,251	1,164	2,415	49,547	39,237	88,784	215,150	234,959	450,109
1 to 2	676	656	1,332	16,666	16,019	32,685	230,463	230,038	460,501
2 to 3	318	315	633	8,900	8,513	17,413	233,385	235,187	468,572
3 to 4	212	212	424	5,870	5,803	11,673	217,806	221,556	439,362
4 to 5	179	182	361	4,123	4,137	8,260	215,225	215,026	430,251
5 to 10	780	876	1,656	9,768	9,369	19,137	1,020,042	1,022,576	2,042,618
10 to 15	910	1,432	2,342	5,101	5,330	10,431	942,534	915,115	1,857,649
15 to 20	2,294	3,232	5,526	6,615	7,126	13,741	836,843	865,094	1,701,937
20 to 25	3,521	3,899	7,420	8,241	8,324	16,565	774,542	888,360	1,662,902
25 to 30	2,983	3,683	6,666	7,216	8,190	15,406	657,138	722,120	1,379,258
30 to 35	2,373	3,094	5,467	6,626	7,623	14,249	601,706	646,972	1,248,678
35 to 40	2,212	2,515	4,727	6,833	7,387	14,220	465,847	482,871	948,718
40 to 45	1,847	1,903	3,750	6,909	6,917	13,826	466,338	486,047	952,385
45 to 50	1,534	1,404	2,938	7,135	6,462	13,597	345,472	349,380	694,852
50 to 55	1,261	1,111	2,372	6,981	6,684	13,665	328,848	351,469	680,317
55 to 60	1,025	874	1,899	7,615	6,982	14,597	202,956	217,199	420,155
60 to 65	749	715	1,464	8,703	8,725	17,428	223,801	247,912	471,713
65 to 70	515	505	1,020	9,220	9,323	18,543	129,211	149,231	278,442
70 to 75	253	246	499	9,335	10,782	20,117	111,365	129,120	240,485
75 to 80	128	109	237	9,357	10,532	19,909	59,546	69,089	128,635
80 to 85	41	26	67	6,651	7,799	14,450	33,295	42,745	76,040
85 to 90	9	10	19	3,487	4,580	8,067	10,770	14,881	25,651
90 to 95	2	3	5	1,006	1,571	2,577	2,662	4,333	6,995
95 et sup.	—	—	—	302	538	840	622	1,175	1,797
All Ages	25,083	28,340	53,423	115,076	207,901	322,977	8,368,914	8,755,174	17,124,088

No. III.

Deaths of Males in London by Phthisis at different periods of life, from the years 1853 to 1857, inclusive.

Years.	Deaths of Males in London by all causes and at all ages.	Deaths by Phthisis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95
1853	30,852	3989	248	81	68	683	917	976	634	291	80	9	2
1854	37,151	3914	295	94	90	638	896	893	587	282	125	14	2
1855	31,354	4070	264	91	92	676	939	923	649	301	118	17	—
1856	29,076	3810	230	71	68	635	873	913	603	285	109	23	—
1857	29,769	3970	249	87	66	570	935	964	643	320	116	7	3

No. IV.

Deaths of Females in London by Phthisis at different periods of life in the years 1853 to 1857.

Years.	Deaths of Females in London by all causes.	Deaths by Phthisis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95
1853	29,217	3404	235	101	114	671	891	737	417	172	53	12	1
1854	36,546	3540	297	106	109	668	852	688	375	161	66	13	2
1855	30,588	3586	279	79	127	708	927	747	402	210	88	18	1
1856	28,198	3484	265	103	91	678	958	739	390	197	50	10	3
1857	29,384	3399	247	85	77	658	910	735	429	190	75	10	3

No. V.

Deaths in England of Males by Phthisis at different periods of life in the years 1855 to 1857.

Years.	Deaths of Males in England by all causes.	Deaths by Phthisis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95
1855	216,587	24,602	1894	654	845	5613	5443	4404	3106	1805	756	115	7
1856	198,875	23,016	1609	528	725	5137	5335	4143	2838	1660	697	108	6
1857	212,356	23,374	1615	522	716	5322	5388	4162	3078	1761	699	87	4

No. VI.

Deaths of Females in England from Phthisis at different periods of life in the years 1855 to 1857.

Years.	Deaths of Females in England from all causes.	Deaths by Phthisis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 &c.
1855	209,116	27,688	1752	708	1330	7375	6861	4813	2596	1478	641	127	7	
1856	191,631	25,934	1593	657	1192	6915	6598	4637	2527	1222	474	89	10	
1857	207,459	26,752	1630	634	1174	7141	6807	4782	2624	1364	517	68	10	1

No. VII.

Deaths in England from all causes, and from Phthisis and Bronchitis.

Years.	Deaths in England from all causes and at all ages.			Deaths in England from Phthisis.			Deaths in England from Bronchitis.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1853	214,720	206,377	421,097	25,955	28,963	54,918	11,587	10,804	22,391
1854	222,422	215,483	437,905	24,206	27,078	51,284	10,303	9,759	20,062
1855	216,587	209,116	425,703	24,602	27,688	52,390	13,783	13,399	27,182
1856	198,875	191,631	390,506	23,016	25,934	48,950	11,043	10,488	21,531
1857	212,356	207,459	419,815	23,354	26,752	50,106	12,798	11,790	25,588

230. *C. Diathesis and temperament* predispose more or less to phthisis, but it is difficult to determine the extent to which they have this effect. It is even more probable, and more agreeable with experience, that original or early-acquired conformation of the body, arising from causes affecting the parents, has more influence in predisposing to phthisis than the temperament, as they have hitherto been described by physiologists, or conventionally admitted by medical writers. Temperaments are so mixed with one another, with diathesis, habit of body, and with states of vascular plethora, or its opposite, as to be rarely distinguished with precision, or to be viewed only as states of constitution, which every physician estimates conformably with his own views, although he may not be able to describe them with precision, or agreeably with the conceptions of others. I have nothing to add at this place to what I have observed above (§§ 9, *et seq.*) on this subject, and that is much less satisfactory to myself than I wish.

231. *D. Seasons, weather, and atmospheric conditions and vicissitudes*, have less direct influence in producing phthisis than has generally been supposed. They are, however, frequent concurrent and determining causes, and when they appear most efficient in occasioning this malady, they often act by producing catarrh, bronchitis, or pneumonia, either of which may develope

quiescent phthisis into a state of action, or call the latent predisposition into a more manifest form. Cold conjoined with humidity, especially when the already predisposed, or those not accustomed to these atmospheric conditions, are exposed to them, and sudden vicissitudes of cold, warmth, and humidity or dryness, or rapid alternations of these, are certainly powerful agents, especially in low situations, in developing phthisis. The rapid transference of terrestrial electricity into the atmosphere, during humid states of the air, has an injurious influence on persons predisposed to, or labouring under phthisis. The vicissitudes of temperature to which many expose themselves by passing from a very warm apartment into the cold external air, or from the latter into the former, and by sleeping in a chamber the temperature of which is many degrees below that of the apartments used during the day, are certainly more or less injurious to persons disposed to phthisis. In cold sleeping-chambers, although the body is protected by warm bed-clothes, the lungs are exposed either to a low range of temperature, or to a higher range generated by breathing the same air repeatedly in consequence of the confinement of the air by bed-curtains. No small injury is often also produced by overexciting or overheating the body, so as to produce copious perspiration, which often chills the surface, and throws the momentum of circulation inwardly, favouring pulmonary congestion, especially when the external surface is not protected by flannel next to the skin. Living in damp or ill-drained houses, removing into recently-built houses before the walls are quite dry, and living in those which are built on a humid or clay soil, without sunk areas around them, or without sufficient space for ventilation, are more frequent causes of disease, and especially of pulmonary consumption, than they are generally supposed to be, especially in persons of a scrofulous diathesis, or otherwise predisposed.

232. The influence of *seasons* on phthisis is but slight, and almost undetermined. Medical statistics give very little information on this topic, and that little is deficient in precision. The returns of the Registrar-General furnish no data respecting it, for the deaths from phthisis during the four quarters present little difference as to numbers; and when the very remarkable differences of duration presented by this disease are considered, it cannot be expected that the deaths can be an index to the seasons in which the malady was occasioned.

233. *E. Climate and Localities.* — *a.* As to the climate of different countries, and as to the influence of situation and locality,

either in favouring or in preventing the prevalence of phthisis, our knowledge is altogether imperfect. Much that has been asserted on this subject is more or less inaccurate, the inaccuracy being often in proportion to the dogmatism with which the matter is treated. That some climates and localities present a much greater prevalence of this disease amongst their inhabitants than others is an admitted fact; but the degree of prevalence, or the amount of influence attributable to climate only, and the shares which may be imputed to situation, circumstances, habits, customs, &c. of the inhabitants, especially the natives, are either very imperfectly known, or not known at all; even at the best an approximation to the truth only is to be expected. Several writers have stated that pulmonary diseases, and more especially consumption, are rare within the tropics, and in the natives of these countries particularly; but Dr. WEBB states that the "records of cases of natives of every part of *India* show that phthisis and pulmonic affections are at least not uncommon diseases among natives of India, and only yield in frequency to fever, cholera, and dysentery, presenting every form and variety that is to be met with in any other part of the world." Dr. GREEN states that pulmonary consumption is a prevalent disease in the lower provinces of Bengal; and Dr. WEBB, who quotes this statement, remarks that he has himself "observed the disease extensively among the Hindoo race, and the Puharrees inhabiting the lower belt of the Himalaya range of mountains." The same writer refers to Dr. GOODEVE's report of the prevalence of pulmonary disease in *Upper India*; wherein he states—"tubercular phthisis we have had abundance of, as the detailed autopsies forwarded every month show." (WEBB's *Pathologia Indica*, p. 100, *et seq.*)

234. *b.* Dr. ARCHIBALD SMITH, in some valuable communications he kindly sent me respecting the diseases of *Peru*, remarks that "In the negro, hæmoptysis is less frequent, perhaps, as a symptom of phthisis, than it is of disease of the heart or aneurism of the aorta. Hæmoptysis is also very often observed in the congestive stage of fever in the Peruvian negro; but with the fever the sanguineous sputa disappear. Comparatively speaking, phthisis is decidedly less common in the negro than in the cross between the negro and Peruvian Indian, or pure Indian bred in the mountains, but migrated to the coast. The mixed races with preponderating Spanish type or blood, constituting the creole white race, nurtured in luxury, idleness, and pleasure, and consequently with an unhealthy physical and moral training, are delicate and feeble of

organisation; and therefore, of all the different races, the most prone to ailments and failing health, and also most subject to tubercular consumption. In the *purely* white race phthisis is comparatively rare, except among such youths as are sent from Europe with pulmonary complaints. But, as these are found in mercantile establishments, they are usually sent from one station to another, without trying the benefit of mountain air; for in the mountains there are few European mercantile establishments. In 1792 Lima contained 52,000 inhabitants, of whom 20,000 were whites, 23,000 of the negro race, 6,000 of the cross of white and Indian, and 3,000 only of the pure Indian. At that period the races were treated in their respective hospitals. The whole deaths by hospital and parochial returns were 2,795 for the year given. From the *white* hospital 650 dead were buried, while 693 died in the negro and Indian hospitals; thus showing a much greater mortality among the whites in general (including the creoles). Now, rest assured that phthisis always maintained its relative position among the causes of death next to fevers and dysentery. In the Indians on the coast the relative mortality is far beyond that of the negro. In Lima phthisis and intermittent fevers are less common in the negro than in the white and Indian races. But diseases of the liver, of the heart and aorta, and of the gastric and intestinal viscera, especially dysentery, commit more havoc in the negro and other dark members of this family, than among the other races."

235. In other parts of *South America* the occurrence of phthisis appears to be infrequent, especially among the unmixed dark races; but the information respecting these parts and races is very defective. In *Mexico* this disease is said to be rare; as respects the city of Mexico this may be owing to its high position above the level of the sea, and to other circumstances; but no information is furnished as to the comparative immunity of different races in this country. According to Dr. HANCOCK phthisis is almost unknown on the coast of *British Guiana*, and very rare in the mountains. This immunity must have reference chiefly to the native races, as instances of death from phthisis have occurred among both whites and blacks who have removed to that country. Col. TULLOCH states that in St. HELENA the mortality of the population from diseases of the lungs is about 3.2 per 1000 annually.

236. *c.* Upon reference to my notes respecting the diseases of those parts of the *west coast of Africa* which I visited and resided in for short periods many years ago, and which were inhabited

almost entirely by true negro tribes, individuals of the white, Arab, or Moorish races being very few, I find it stated that phthisis, remittent, and intermittent fevers appeared very rarely to occur among the former; but when they migrated to somewhat colder climates, even to the West Indies, phthisis was sometimes observed among them; and this became the most fatal malady to them, excepting small-pox, when they were sent to temperate or cold climates. Although dysentery and chronic diarrhoea were amongst the most prevalent and fatal maladies among negroes in those parts of Africa, yet the liver appeared less frequently diseased than the spleen in this race; and much less so than in the purely white and mixed races. Amongst negro children, however, I remarked that mesenteric disease was not uncommon.

237. *F. Race.*—After considering the distribution of heat over the globe as displayed by the isothermal lines of HUMBOLDT and by the later researches and illustrations of Professor DOVE, I infer that less is owing to temperature than to *race* and modes of life in the causation of phthisis. There are numerous circumstances which concur with temperature in producing a climate either favourable or unfavourable to the prevalence of phthisis; and of these coldness and humidity of the air, low elevations from the surface of the ocean, sudden and frequent vicissitudes of temperature and weather, are amongst the most influential elements of a climate which favours the production of this malady; whilst a moderately warm and dry atmosphere, considerable elevation above the sea, especially in warm countries, and regularity of season and temperature and weather, greatly diminish the prevalence of the disease, and favour recovery in the early stage of the malady. But these conditions, favourable and unfavourable, are so associated with numerous other agencies, especially with the influences of race, of social and domestic conditions, of food, habits, and modes of living, &c., that it is impossible to determine the amount of influence which may be ascribed to each.

238. There can be no doubt, however, that the disposition to phthisis existing in different *races or varieties of our species* should be viewed in very intimate connection with the climates in which they reside, and with the food and modes of living adopted by them. Having ascertained the frequency of the disease in the aborigines of a country or climate, it is next of importance to know how far that frequency may be modified—diminished or increased—by change to other countries, either colder or warmer, or of higher or lower elevation, &c., and by the adoption of different

food and other habits. Our knowledge of these subjects is deficient and the difficulties in the way of improving it are many; but before I endeavour to draw a few brief inferences closely connected with it, I shall succinctly notice such information as I have found calculated to remove a few of these difficulties.*

* Dr. LEE of New York states that in the city of Baltimore for the year 1850, the mortality among the blacks from phthisis was 50 per cent. greater than among the whites,—the males being 43·5 per cent., the females 56·5 per cent. If we compare the sexes at different ages, we find that up to 15 years the per-centage is the same for both. From 15 to 45, it is 38 per cent. for males, and 62 per cent. for females. After this age the males slightly predominate. It thus appears that the child-bearing period furnishes the larger proportion of deaths from phthisis in this race.

The mortality from consumption, as compared with the whole deaths, excluding still-born, in the following cities is given, as follows, by Dr. C. FRICK (*Amer. Journ. of Med. Science*, 1855, p. 330):—

Baltimore, average from 1850 to 1854 is	.	.	.	1 in 6·2
Philadelphia " 1854	.	.	.	1 in 8·0
New York " 1852 to 1854	.	.	.	1 in 7·5
Boston " 1848 to 1852	.	.	.	1 in 6·6
London " 1853 and 1854	.	.	.	1 in 9·2

As respects the deaths from phthisis in *London* during these two years, the average was only 1 in 9; whilst, with the exception of the year when pestilential cholera prevailed, the ratio being then 1 in 9·3, it was only 1 in 8·3 during the five years from 1853 to 1857, inclusive. The deaths in all *England* from 1853 to 1857, inclusive, averaged nearly 1 in 8·2.—so that very little difference exists between the mortality in *London* from phthisis and that registered for all *England*.

Dr. LEE says that the deaths from tubercular consumption throughout New England vary from one-seventh to one-fourth of all that die, according to locality and other circumstances. "The seeds of the disease seem to be more extensively sown in the autumn and winter than at any other season. A much greater proportion die of the disease between the ages of 20 and 30 than at any other period, and during this period the number of females who die of the disease in New England is nearly double that of the males. The same holds true between the ages of 30 and 40. In the country towns of Massachusetts the proportion of the sexes who die of phthisis is as 39·01 males to 60·99 females; in New York it is as 42·08 to 57·92; and in England, except London, it is as 46·13 to 53·87. It would seem that some causes exist in country towns to extend the disease among females, while different causes exist in cities to increase the disease in the other sex."

It is a mistaken notion, Dr. LEE states, that more die of this disease on the seaboard than in the interior. "From 1842 to 1848, in the four western counties of Massachusetts, out of 11,803 deaths from all causes, 2,398 were from consumption, or 1 in 4·92. During the same period in the eastern counties, out of a total of 22,930 deaths, 5,333 were from consumption, or 1 in 4·29. In Boston from 1830 to 1849, the deaths from phthisis were 1 in 7. In New York from 1838 to 1843 there was, on an average, one death annually from tubercular phthisis to 194 inhabitants. In Philadelphia from 1836 to 1845, 1 in 284; and in London from 1838 to 1842, 1 in 205. In Portsmouth, U. S., from 1801 to 1825, the deaths from this disease were 1 in 5·02. In Providence, Rhode Island, from 1841 to 1845, 1 in 4·58. In New York city from 1811 to 1845, 1 in 5·03. In Philadelphia from 1811 to 1845, 1 in 6·81. In Baltimore from 1821 to 1845, 1 in 5·97. In Charleston, South Carolina, from 1822 to 1845, 1 in

239. In countries in which the isothermal lines of annual temperature range from 70° to 85° , phthisis appears to be rare among the aborigines; but it is more or less increased in frequency in mixed races, and in those who have migrated from very warm to cooler districts, or from a dry and elevated situation to low and humid localities; but the amount of increase under these circumstances cannot be shown. *Upper Egypt* and other parts of *Northern Africa*, and those places in *Western Asia* where the annual range of temperature is not much above 75° , or below 65° , phthisis is very infrequent, although numerous circumstances combine to occasion external tuberculosis, especially in children, and probably also mesenteric disease; and of these circumstances the most influential are evidently insufficient and unwholesome food, and want of cleanliness. The immunity of these countries, more particularly of Egypt, from phthisis, was well known to the ancients from the days of ARISTOTLE; and hence this country was recommended by them as a place of residence for consumptive patients. It is stated by CHARDIN, FRYER, KAYE, KERNS, and others, that consumption is seldom observed in *Syria* and *Persia*; and MM. BROUSSAIS, BOUDET and other French writers remark that phthisis is rare in the natives of *Algiers* and of the *Barbary Coast*, the mean annual temperature varying from 68° to 72° . The former of these writers observe, that in *Algiers*, where periodic fevers prevail, of 40,000 cases in the French army only 62 were consumptive; and that the deaths from this disease were 1 in 102, while in the army in France they were 1 in 5. In the *West India Islands* the annual mean temperature varies from 75° to 80° . The statements respecting the prevalence of phthisis in these islands vary remarkably, and are often contradictory; but upon the whole it appears that this disease is not infrequent among the dark races, especially negroes who have been brought from Africa, and among creoles. Drs. MUSGRAVE, DAVY, and HUNTER say that it is rare among the indigenous inhabitants. The reports of Col. TULLOCH give five deaths from disease of the lungs annually in 1000 of the population in Jamaica; and a greater mortality from phthisis among white troops stationed in these islands than in their own country, but a much less mortality when stationed in the East Indies.

6-58. In England from 1838 to 1842, 1 in 6-20. In London from 1840 to 1847, 1 in 6-97. In Paris from 1816 to 1819, 1 in 5-55. In Geneva from 1844 to 1846, 1 in 9-91. Statistics prove that this disease is as prevalent in our southern states, and in the West Indies, as in New England, and far more fatal than in Canada and the British provinces of North America. — (Dr. LEE, in *Dict. of Pract. Medicine* by J. Copland, M.D., &c., vol. iii. pp. 1235, 1236.)

240. The *East Indies* furnish a variety of climates, according to latitude, elevation above the level of the sea, and the other elements constituting climate. The annual isothermal lines vary accordingly from 66° to 82° ; and cases of phthisis amongst the native races are not rare, especially in the jails and other places, where several causes concur with race and climate in occasioning the disease. According to the accounts furnished by STEWART, JACKSON, BALFOUR, SYKES, and others, it appears that external scrofula and phthisis occur, especially the former, in the several races in the East Indies, but in very different degrees of frequency. The writers on this subject generalise from very limited sources of observation, in respect both of climate and race. It is, however, agreed that tuberculosis, both external and internal, are most prevalent in the half-castes, or cross between the whites and natives. Col. SYKES states that in 267,456 cases of all diseases treated during five years at the dispensaries in *Bengal and North-West Provinces*, there were 115 cases of external scrofula and three deaths, and 187 of phthisis and nine deaths; thus showing a low rate of tuberculosis in the natives of India. Dr. BALFOUR states that phthisis is very rare in the natives serving as troops in the *Madras* Presidency, the deaths annually from this disease being only $\cdot 4$ or $\cdot 3$ per 1000. It should not, however, be overlooked that negroes, when removed either to the West or East Indies, are more liable to phthisis than in their native countries.

241. As to the frequency of phthisis in *Madeira*, accounts are most contradictory; some writers stating extreme opinions on the subject. Upon the whole it appears, that the disease is not infrequent among the natives, and that it is even common among the lowest class. In *Malta*, in *Italy*, *Spain*, *Portugal*, *Greece*, *European Turkey*, and southern parts of *France*,—in all the places to which consumptive patients are so often sent from this country,—the disease is more or less prevalent; generally as frequent in all these places as in this country, and in some even more frequent. M. ANDRAL states phthisis to be very prevalent in the Mediterranean Archipelago. Mr. SPENCER WELLS says that one-third of the deaths at the Royal Naval Hospital in Malta was from this malady; Dr. BURGESS, LUGOL, ANDRAL, MERRYON, and others, phthisis is most fatal, especially in certain localities, both in *Italy* and *France*; and of these Orleans, Rheims, Montpellier, Marseilles, Nice, Rome, Naples, &c., are not the least remarkable. Mr. ANCELL gives the following table of the ratio of deaths from

phthisis to all deaths in the civil and military hospitals of these countries :—

Leghorn .	Civil and military .	1 in 10·75
Florence .	Civil .	1 in 11·5
Rome .	“ .	1 in 3·4
Naples .	Average of three hospitals .	1 in 2·33
“	Military .	1 in 3·85
Paris .	Civil .	1 in 3·25
“	Military .	1 in 12·2

In Marseilles the deaths from this disease are stated to be one in four, in Naples one in eight, in Nice one in seven; but these can be viewed as approximations only to the truth. There can be no doubt that, even omitting the deaths from other tubercular diseases, those which occur from tubercular consumption among the inmates of children's hospitals or institutions, and those brought up in these institutions, are even greater than any just noticed in either of these cities. Dr. CASPAR of Berlin gives the following table of deaths from phthisis in different cities in Europe and the United States, the average being about one in six :—

Berlin .	during 10 years	1 death from phthisis in 5·7 deaths
Paris .	4	1 . . . 5·5
London	2	1 . . . 6·2
Hamburgh	3	1 . . . 4·6
Stuttgart	10	1 . . . 4·7
New York	11	1 . . . 5
Philadelphia	7	1 . . . 7·7
Baltimore	8	1 . . . 6·7
Boston .	7	1 . . . 5·9

In *Belgium* and *Holland* phthisis is quite as prevalent as in England and France. In *Sweden* the deaths from this disease are said to be about one in nineteen of all deaths. Dr. GELLERSTEDT remarks that the mortality from this malady in the military hospitals in Stockholm is eight in 1000, and that the life of a soldier is favourable to the production of phthisis, which he believes to be on the increase in Sweden. According to a writer in the *British and Foreign Review*, this disease is rare in *Denmark*, and still rarer in *Norway*, *Lapland*, *Iceland* and the *Feroe Isles*. In *Canada*, notwithstanding the severity of the winters and sudden alterations of temperature, the air being dry, tubercular maladies, and especially phthisis, are comparatively rare. In *Russia* this disease is much less frequent than in the southern countries of Europe, although both Sir A. CRICHTON and Sir G. LEFEVRE state that external scrofula is very prevalent, especially in St. Petersburg

and Moscow, and remark that those who bear about them scars from scrofula are supposed to be exempt from phthisis.

242. "In the *Southern Temperate Zone*, between the isothermal lines of 40° and 70° , comprising the southern part of South America, the Cape of Good Hope, with a portion of South Africa, nearly the southern half of Australia, Van Diemen's Land, and New Zealand, all accounts lead to the conclusion that tuberculosis is much less frequent than in countries situate to the north of the northern tropic." This comparative immunity is owing to the remarkably less liability of the native races to the disease, and to the general dryness of the air notwithstanding the sudden vicissitudes of temperature. Other conditions, either not known, or imperfectly appreciated, may also concur to produce this result. In many parts of Australia, however, the quantity of dust so frequently floating in the air, during the hot and dry seasons, in some measure counteract the other beneficial influences of the climate as respects phthisis.

243. In the statistical accounts which have been furnished respecting the prevalence of phthisis in different parts of the globe, the influences of race and of the food adopted by races and by the inhabitants of different countries, are not sufficiently considered, or are even altogether overlooked. Although statistics may nevertheless furnish much that is important on this subject, yet there are other circumstances besides these which have not been taken into the account. Of these not the least important are, the influences of religious institutions and rites; of the states of social intercourse; of modes of living and of warming apartments, in cold and in temperate countries; the effects of the soil, of vegetation, of water, and of the emanations from them. Of the agency of these, either in favouring or in counteracting the prevalence or frequency of phthisis, our knowledge is very deficient.

244. From the imperfect information furnished by statistics and by other sources of knowledge, and from what I have stated under CLIMATE in the work already referred to, I venture the following inferences as comprising most of what is known of the influence of climate, and of its more important effects, in causing tubercular consumption.

a. Phthisis is more or less prevalent in the northern temperate zone, especially in the countries of Europe and the United States of North America.

b. This prevalence is most remarkable in the Caucasian race,

and in the crosses of this race with any other, more especially with the negro and other dark races.

c. The natives of countries to the northward of the temperate zone are rarely affected with phthisis while they reside in these countries and continue the habits and modes of life — of clothing, lodging, sleeping, living, and feeding — which are generally adopted by them; but when they are removed to more temperate climes, and adopt the habits and modes of life of these climates, they evince a manifest tendency to phthisis, which is probably heightened by the nostalgia to which they are subject when removed from their native countries and from accustomed pursuits, habits, &c.

d. The negro and dark races inhabiting intertropical countries, and the dark races peopling the islands within the tropics, and those in the southern temperate zone, are rarely subject to tubercular consumption as long as they remain in their native countries and islands, and continue their usual habits and modes of living; but the offspring from a cross with the Caucasian race, especially when they remove to a temperate or cold and humid climate, and still more these native races when they migrate to such a climate, are even more liable to phthisis than the inhabitants of temperate countries.

e. The immunity of the natives of the countries to the north of the temperate zone from phthisis is mainly attributable to their active vocations in the open air, to the nature of their food, and its adaptation to the temperature and climate, to the general dryness of the air, to the warmth of their clothing, whereby the skin preserves its depurating functions, and to the warmth of their sleeping places.

f. The immunity, or comparative immunity, of the negro and dark races from phthisis while they reside in their native countries, is chiefly to be attributed to their outdoor modes of living and exercises, to the adaptation of their food to high ranges of temperature, to the influence of miasmatic districts in counteracting the tendency to tubercular consumption, and in no small measure to the increased functions of the skin in these races; these functions being in them more decidedly supplementary of those of the lungs and liver, — more actively depurative of the blood than in the white race.

g. The greater liability of the dark-skinned races to phthisis when they migrate to a temperate or cold climate, is mainly attributable to the asthenic diathesis of these races, to the depressing

influence of cold, especially in cold sleeping apartments, upon the vital condition of their lungs—to the blight which a low range of temperature produces upon the organs of respiration; to the change in their habits, modes of living, food, &c. The proclivity of cross-breeds to this malady is partly owing to the causes just stated, in connection with their indolence, their debauched habits, their venereal excesses, and indoor occupations—if occupied at all. The dark races and mulattos, when they migrate to countries whose annual range of temperature is much below that of their native climates, are disposed to congestive or asthenic inflammatory affections of the lungs; in which, owing to the low grades of vital power and vascular action, the morbid exudation is incapable of the usual changes consequent upon sthenically increased vascular action; but, instead, assumes the tubercular form, or that state which is incapable of organisation, and equally incapable of absorption, and which undergoes the alterations characteristic of tubercular matter.

h. The Mongolian race, especially as typified by the Chinese, does not appear to be more liable to phthisis than the natives of the northern provinces of India and of the countries in Asia between China and Europe. Of the Chinese and Japanese, as well as of these latter countries, our knowledge is very imperfect as respects the relative prevalence of disease. But from what I can learn, tubercular phthisis is not a prevalent disease among them, at least as long as they remain in their native climates and pursue their usual occupations, habits, and modes of living. How far the various races and tribes inhabiting these vast regions may be liable to this malady when they migrate to either colder or warmer countries, is not known; but the results must manifestly depend upon the many circumstances attendant and consequent upon such migration.

i. The food of man increases the disposition to phthisis in as far as it is not adapted to the constitution and wants of the races in their native countries—to the different races inhabiting cold, temperate, and tropical climates; to each of which it requires to be appropriate in its nature, as shown in the article CLIMATE in my *Dictionary of Practical Medicine* (§§ 26, *et seq.*). This adaptation of food to race and climate extends to the beverages used by the inhabitants of different countries; the neglect of this principle of Hygiene being demonstrated by the destructive effects of ardent spirits in the dark-skinned races, which are comparatively so little injurious to the natives of cold countries.

k. The influence of clothing upon the frequency of phthisis requires, equally with food, a reference to race; and the considera-

tions which apply to the one appear in great measure to apply to the other. In all races the clothing, and in the dark races the inunctions of the skin, in addition to the slight clothing required by the vicissitudes of season and weather, tend to promote the regular discharge of the cutaneous functions; the fair-skinned races of Europe and America being those in which these functions are least active in health, and most liable to interruption.

l. In our estimates of the influence of climate on the frequency of phthisis in the white races, a cold moist climate, and low situation, and without being miasmatic, or a variable and humid climate, is the most favourable to the production of this disease; whilst a dry, temperate, and moderately elevated situation, with a regular procession of the seasons, or a limited range of temperature, is that which is most likely to diminish the frequency or arrest the progress of the malady. Other considerations connected with climate will be entertained when the prevention of phthisis is discussed.

245. *Religion and religious rites* may be viewed by many as exerting no influence on the frequency of phthisis or of any other disease in any climate. I believe, however, that religious rites exert some influence, but the extent of that influence I cannot state; indeed, it would be impossible to ascertain it, especially in Mohammedan countries, and in countries to the eastward and the north of the former. There can be no doubt, however, that the strictness of diet, and the rites of the Jews, notwithstanding several counter-vailing influences to which they have been exposed during many centuries, have rendered scrofula, phthisis, and gout less frequent among them than among other peoples in their vicinity (§ 189).

246. *G. Confinement in prisons, barracks, hulks, workhouses, hospitals, and expatriation, &c.*, are severally productive of phthisis, both in the predisposed, and in those who have evinced no marked predisposition; but in the former most especially.—*a.* In prisons, hulks, and workhouses several injurious influences, physical and mental, combine to produce a more or less marked effect. Insufficient ventilation, want of exercise in the open air, and of light or sunshine, deficiency of external warmth, low grades of temperature conjoined with humidity, or with low and moist situations, and insufficient or unwholesome food, generally combined with depression of spirits, longings after liberty, and weariness of prolonged or hopeless confinement, are the frequent causes of phthisis among the inmates of these places. Dr. BALY states that, in a period of eighteen years in the Milbank Penitentiary, nearly half the deaths and half

the pardons on medical grounds were due to tubercular disease, the frequency of this disease progressively increasing after a few months' confinement; and the ratio of mortality in this prison being nearly four times more than that of the metropolis, as regards this malady. Dr. BALY has further shown that a similar increase of phthisis among prisoners occurs in other places of confinement, both on the continent of Europe and in the states of North America. Dr. ALLEN WEBB remarks, on the authority of Dr. GREEN, that in the jail of Midnapore, in Upper India, in $22^{\circ} 30'$ north latitude, and $87^{\circ} 25'$ east longitude, and in the Calcutta prison, phthisis frequently occurs, although in a hot climate, where this disease is but slightly prevalent. In these intertropical prisons the malady often follows attacks of pneumonia, or it assumes the acute and febrile form, or that described as most common in children (§§ 95, *et seq.*).

247. *b.* Many of the conditions existing in prisons are, to some extent, present also in *barracks* and in *workhouses*. According to the *Army Reports*, the British foot-guards are much more liable to consumption than the general London population; and in most stations, both in temperate and in warm climates, the mortality from phthisis in barracks is much greater than among the officers or the general population of the country. As respects the guards, something may be owing to the height of the men, tall men being more frequently predisposed to this disease than those of middle size; but much more is certainly owing to the congregation of numbers in a limited space, to the irregularities and vices of a barrack life, and to the influence of a vitiated atmosphere. The results are similar, and often more remarkable, in large public or private schools, where a large number sleep in one apartment, and breathe repeatedly the same air.

248. *c.* *Constrained postures* during employments, stooping positions, and the pressure on the edge of a desk during studies or occupations; prolonged application in employments and studies favouring constrained, or unchanged postures, more especially where the air is impure, or when the apartments are overcrowded or insufficiently ventilated, as in factories, workshops, more particularly in the workshops of tailors, shoemakers, in printing-houses, in woollen and cotton factories, &c.

249. *d.* Confinement in *workhouses* and *hospitals* is injurious chiefly by inducing tubercular disease, in some form or other, and especially in that of phthisis. In the hospitals for children this is especially the case, as shown by MM. RILLIET and BARTHEZ. The continued respiration of the air of an hospital or workhouse, without

removal from the wards or apartments into the open air, is even more injurious than breathing a more impure air than that in these places, when exercise in the pure open air is enjoyed during the day; the continued respiration of even a slightly impure air being more injurious than the respiration after intervals of a much more vitiated atmosphere. The impurity of the air in these places is caused by the numbers breathing the same air in a confined space, by the exhalation from the bodies of the inmates, and by the effluvia proceeding from diseases, morbid discharges, &c. Infants of women confined in lying-in hospitals often become generally tuberculous if they remain long in these places, as I have observed on several occasions when consulting physician to one of these institutions.

250. *e. Expatriation*, either by transportation for crimes, or by emigration, unless the climate to which expatriation takes place be dry and temperate, is generally followed by an increase of mortality caused by tubercular consumption. Even removal from the high lands and from the scenes of early youth to the low and humid situations in the same latitude, although the temperature be milder, causes an increased disposition to phthisis. This is partly owing to the mental emotions consequent upon the removal so frequent in young persons thus circumstanced, and is greatly increased by the nostalgia produced in these instances (§ 225).

251. *f. Poverty, and the vicissitudes of fortune and of life* have no mean influence in both predisposing to and exciting tubercular consumption. MM. LOMBARD, D'ESPINÉ, and LEBERT have furnished sufficient evidence that this malady is much more prevalent among the poor than among the middle and highest classes of society. M. LOMBARD states that the combined statistics of phthisis in Vienna, Paris, Hamburg, and Geneva, show that the disease is doubly more prevalent among the poor than in the higher classes. Every competent observer must have remarked the occurrence of phthisis after the loss of fortune, honour, and friends, and have seen mental depression, conjoined with poverty, slowly developing this disease in its most irremediable form, in all temperaments and constitutions, and even independently of hereditary or other states of predisposition. (See also §§ 221, *et seq.*).

VI. PATHOLOGICAL CAUSES OF PHTHISIS.

252. Previous disorder or disease more frequently both predispose to and directly occasion tubercular consumption than is commonly

supposed; and the effect is produced not merely by calling the tubercular germs into activity where they already exist, but also by causing their formation and progressive development where no evidence either of a tuberculous diathesis or of their existence had been previously detected. If we endeavour to trace the pathological changes as they successively occur, and remark their nature, from those characterising the previous disorder to those which interpose between that disorder and those which constitute the incipient stage of phthisis, we shall be especially struck by the influence produced upon the vital and constitutional powers by the disorder, although apparently slight, which has occasioned this malady. Several of these disorders are so insidious, and others of a more important nature are in some cases so mild, as not to excite any apprehension as to the effects they may produce, and thus they are allowed to proceed, or are exasperated by exposure and neglect of proper treatment and regimen, until the changes or states which either indirectly lead to tubercular deposits, or directly produce them, more or less fully supervene. In other cases severe attacks of disease, either inflammatory or exanthematous, are injudiciously treated or neglected towards and during convalescence, owing to the desire of the patients or their friends to get rid of medical attendance; or are imprudently or prematurely exposed to the various internal and external causes of disease, and especially to those which in such circumstances more particularly depress organic nervous power, disorder digestion and assimilation, and blight the vital functions of the respiratory organs. During convalescence from epidemic and exanthematous maladies, and from inflammatory affections of the respiratory passages and organs, the patient is often left, by his own self-will and ignorance, without those means which are required to restore his exhausted vital energies, to renew the vigour of the organic nervous system, to improve digestion and assimilation, and to promote the healthy metamorphosis of the colourless chyle globules into the red globules of the blood. In many diseases, and especially in exanthematous and other fevers, the waste of the hæmato-globulin is progressive, and at the period of incipient convalescence it is generally greatest, and the blood is then poorest and most deficient in red globules. Now, if these states of exhausted organic nervous influence, and of impoverished circulating fluids, be not improved by judicious treatment and regimen, or by change to a healthy air, &c., and more particularly if they are influenced by injurious exposures or agents, digestion, assimilation, and nutrition are liable to be perverted, and tubercular

germs are thereby rapidly developed, or are directly or primarily produced.

253. *A. Previous disease of the respiratory and circulating organs* has no mean influence in predisposing to, or in directly occasioning phthisis. Frequent attacks of catarrh, catarrhal fever, influenza, hooping-cough, bronchitis, asthma, broncho-pneumonia, pneumonia, chronic debility, rickets, &c., are severally calculated to develop phthisis, particularly in the scrofulous and lymphatic diathesis; though it is not necessarily a consequence of these, but more generally independent of them, as to its origin. In these diseases the evil is not always to be ascribed to the development during their course of the germs of tubercle which had previously existed, but to the primary formation of these germs or deposits during their progress and decline, or their periods of decadence, constituting the early stage of convalescence. In this stage excited action has subsided into more or less of exhaustion, vital power is locally or generally impaired, the circulating fluid somewhat wasted as respects its most assimilated elements, and the digestive and assimilating functions considerably weakened. Diseases of the heart, especially valvular diseases, causing either congestion of the lungs or hæmorrhage from the bronchial tubes, have also no mean influence in developing phthisis; for the congestion thus occasioned is not unfrequently productive of an exudation either into the air-cells or into the parenchyma of the lungs, which passes into the tubercular form, or is converted into or becomes the nidus of fully developed tubercles. Similar results may also follow the exudation of blood from the bronchi, especially if the fluid pass into the air-cells.

254. *B. Exanthematous diseases* are often followed by phthisis, and this latter malady is more likely to originate during the decline of these diseases, or in their early and advanced stages of convalescence, than at an early period. Of all this class of diseases there is none that is more productive of phthisis, or more rapidly develops it, where the germs of the malady already exist, or where a predisposition to it is present, than *measles*, and this is more especially remarkable in persons about or above the age of puberty. I have often observed persons who, by diathesis, hereditary predisposition, or other circumstances, were possessed of a consumptive tendency, pass through measles without any marked pulmonary complication, or any pulmonary disorder that could be detected by auscultation or otherwise, and yet during the progress of advanced convalescence, or soon afterwards, indications of incipient phthisis have appeared, especially if any exposure or want of care had favoured the deve-

lopment of the malady. In this, and in others of the exanthemata, the decadence of the disease, and the consequent convalescence, present, as just stated, the most favourable occasions for the origination of phthisis, and these should be carefully guarded against.

Of all the exanthemata, there is none so unfrequently followed by phthisis as *small-pox*. It would appear that this latter malady either carried off most of those predisposed to phthisis, when smallpox was a more prevalent disease than it is now, or it destroyed the predisposition to phthisis. I have long remarked, and I believe that others have also remarked, the very rare occurrence of phthisis in any one even but slightly marked with smallpox. It is manifestly otherwise with *vaccinia*, for what I have stated with respect to its influence on the frequency of SCROFULA (§ 210) is equally applicable to phthisis. It does not appear that *scarlet fever* is influential in producing or developing phthisis further than that the debility consequent upon it, during convalescence, requires a careful protection from exposures and other exciting causes of this latter malady. Scarlet fever is often attended or followed by enlargement and suppuration of the glands of the neck, especially in scrofulous subjects; and in these cases, as well as in other scrofulous cases, when these glands suppurate, the liability to tubercular consumption is thereby greatly diminished.

255. *C. Suppressed or excessive secretion or excretion* is often more or less concerned in occasioning phthisis. The suppression of an accustomed evacuation or discharge, or the drying up of an issue, seton, or ulcer, or the healing of a fistulous ulcer, as *fistula in ano*, has been followed by phthisis; but in all such cases as have fallen within my observation, the disease had commenced previously, or had even made some progress; the suppression of the discharge, especially of hæmorrhoids or the catamenia, or of the cutaneous excretions, having been followed by a more acute form of the disease, or having developed a latent or a chronic or slow and insidious state of phthisis, into the congestive, inflammatory, acute, or hæmorrhagic, according to the diathesis or habit of body of the patient.

On the other hand, excessive discharges, whether hæmorrhagic, secretory, or excretory, may so weaken the constitutional powers — may so depress organic nervous energy and impoverish the blood, by wasting its hæmato-globulin, as to be followed by tubercular phthisis, either where a predisposition to it already existed, or where causes tending to blight the vital condition of the lungs were in operation, as cold, humidity, &c.; excessive losses of blood, by

operation or from hæmorrhoids, from menorrhagia, flooding, &c.; prolonged or improper suckling, diarrhœa, or dysentery, enteric fevers, masturbation, and venereal excesses,—have severally not infrequently either caused or developed phthisis, especially where a predisposition to it was present.

256. *D. Impaired organic nervous or vital force*, or debility, whether hereditary, original, or acquired during childhood, youth or maturer age, is more intimately connected with the occurrence of phthisis than is generally supposed, and is directly concerned with the causation of the impaired conditions of digestion, assimilation, and nutrition, which constitute a large portion of that circle of morbid actions characterising the commencement and early stage of tubercular consumption.

257. *E. Morbid states of the circulating fluids*, both the chyle and blood, that are so often present at an early stage of phthisis, or even before this state has manifested itself, are the first results of impairment of the organic nervous power; and although comparatively rarely declared in the form of anæmia or chlorosis, yet they consist of a greater or less deficiency of the hæmato-globulin, and especially of the red globules, with an excess of the colourless globules, and a weakened crasis or diminished vital cohesion of the fibrin, and consequently of the coagulum.

vii. INFERENCES AS TO THE OPERATIONS OF THE CAUSES OF PHTHISIS.

258. Having taken a comprehensive view of the causes operating on the parents and on the offspring at early periods of life tending to produce scrofula and tubercular consumption, but most frequently the scrofulous taint directly or more immediately, and phthisis consecutively, the following *inferences* may be drawn as to the operation of these causes and of the consequences which more directly and more remotely follow:

A. a. Phthisis, whether hereditary and proceeding from causes affecting one or both parents, or produced by causes acting during early or mature age, generally arises from a concurrence of causes, one or more of which may be much more effective than the rest: they may act either contemporaneously or successively, or the influence produced by one or two may be reinforced or determined by others acting subsequently.

b. The causes, then, either affecting the parents and the offspring through them, or the individual only, during early childhood or subsequently, in the many modes of their combination or

succession, are of such natures as to impair the vital force or power, especially as regards the manifestations of the organic or ganglial nervous system, and of the organs and functions endowed by this system.

c. As this system actuates the vascular organs, vessels, and the blood, and as it influences also the digestive, assimilating, and nutritive functions, the secretions and the excretions, so it necessarily follows that causes which imperfectly develope or depress, or exhaust, or otherwise impair the vital force, or the power of this system,—the organic nervous—will co-ordinately affect the states of the assimilating functions of the blood, and of the secretions and excretions.

d. That the offspring of persons thus depressed or exhausted inherit *ab ovo* a weak organisation in respect of both the osseous system and the softer structures, and are endowed similarly to the parent or parents, as regards the vital force and its manifestations, by the digestive, nutritive and circulating functions; the vital endowment and its manifestations in the offspring, varying according to the vital force and structural organisation of one or both parents.

e. That the causes which thus act on the parent or parents, and through them upon the foetus and infant, exert a similar action on the infant, child, or young of strong and healthy parents, but in a less permanent or less marked manner.

f. That muscular power may exist in a very marked degree in the scrofulous diathesis, as this power is generally developed by exercise, &c., but it is seldom so enduring or so capable of being exerted for as long a time, as in healthy constitutions.

g. That the manifestation of scrofulous or tubercular disease in the bones or glands, &c., in childhood or youth, or in other words the development of the scrofulous cachexia or taint into actual disease of the bones or glands in the early epochs of life, generally prevents the occurrence of tubercular consumption.

h. That the advance to adult age is attended by a more marked limitation of internal tubercular deposits to the lungs, or to fewer internal organs.

i. That the scrofulous cachexia and internal tubercular disease are characterised also by an altered condition of the blood, owing chiefly to deficient vital force, and to the impaired manifestations of this force in the digestive, assimilating, and circulating organs.

259. B. The following may thus be inferred as the successive morbid changes resulting from the efficient action of the causes of

phthisis, whether occurring singly or in various combinations, or in succession:—1st. Depression of the organic nervous or vital force of the body, or an imperfect development of this force or power, owing to hereditary or congenital, or to more immediate or direct causes, operating in early or advanced epochs of life; or to age, pre-existing disease or taints, &c.: 2nd. Morbid states of the circulating fluids, especially of the chyle and blood, commencing with the slow or imperfect development of the chyle globules, and followed by a slow and impaired metamorphosis of these and the blood globules, or of the former into the latter,—the plasma or *liquor sanguinis*, with its fibrine, being deficient in vital endowment: 3rd. As the waste of the tissues and of the red-globules exceeds the repair and nutrition, effete materials accumulate in the blood, owing to impaired excretion, and are partly deposited in the form of tubercular matter in one or more organs and tissues: 4th. After the formation of tubercles, their softening, decomposition into their several elements, and the morbid fluids resulting therefrom as well as from the adjoining tissues, are followed by more or less of their absorption into the circulation, by further wasting of the tissues or diminution or wasting of the red-globules, by an impairment of the vital crasis or endowment of the *plasma sanguinis*, and by the further accumulation of effete and morbid matters in the blood: 5th. Thus while the nutrition and vital cohesion of the tissues—the organisation of the frame—ultimately suffer, the contamination of the blood by the passage into it of imperfectly assimilated materials, and by the absorption of morbid matters, especially of softened tubercles, excites or even irritates secreting organs and surfaces, and causes excessive secretion and excretion, and ultimately inordinate waste, emaciation, and exhaustion.

These changes in the organic nervous influence or vital force, in the circulating fluids, and in the nutrition of the structures, produced by the causes of phthisis, may take place contemporaneously and co-ordinately; but they may more reasonably be supposed to advance in succession, however rapidly, impaired organic nervous power accelerating and increasing the other subsequent changes. That this procession of morbid changes actually obtains may be inferred from the modes in which the causes may be presumed to operate; for those causes which primarily and chiefly affect, by depressing or impairing, or imperfectly developing, organic nervous power, as hereditary influence, the depressing emotions of mind, &c., may rationally be presumed to operate

consecutively, and to no slight extent also impede and disorder digestion, assimilation, and the healthy metamorphosis of the chyle and blood globules, and ultimately the nutrition and vital cohesion of the tissues. Many other causes which more directly tend to prevent the development of the chyle and blood globules, or to promote their waste or destruction, as insufficient food, increased discharges, &c., depress organic nervous or vital power, while they impair or arrest nutrition. Certain causes, again, exert a still more extended influence; for they act directly and manifestly, both by depressing or exhausting vital power and resistance, and by accelerating or increasing the waste and destruction of the hæmato-globulin; nutrition, and the healthy conditions of both the fluids and the tissues being more or less impaired. The most influential of these last causes are premature or excessive sexual indulgence in either sex, masturbation, excessive secretions and discharges, sedentary occupations in ill-ventilated and over-crowded apartments, impure air of any kind, confinement, and insufficient exercise, defect of light and sunshine, &c.

260. *C.* The causes which have been above delineated usually act in various combinations of two or more, seldom singly, often in different modes of succession, or concurrence, in producing pulmonary consumption. As to the mode of their action, they commonly *predispose* the body to the injurious influence of more energetic causes, which in various states and succession act either locally or on the respiratory organs, or on the constitution, and thereby *excite* or *develope* the malady. But many of the causes above described may become, by their energetic influence relatively to the vital powers of the individual, singly, or at least chiefly or essentially, the efficient cause of the malady. These causes, which may thus be either predisposing or exciting causes of the disease, according to their more passive or energetic operation, and to previous and concurring circumstances and occasions, are chiefly those which I have denominated *pathological*, and mentioned above (§§ 252, *et seq.*). Several of these may even become associated with, as well as the causes of, phthisis, especially pneumonia, bronchitis, asthma, hooping-cough, measles, catarrhal fever, influenza, rickets, &c.

a. Wherever either of the above states of predisposition exist, the disease may be *called into existence*, or may be developed from a latent or chronic form into activity, by a variety of circumstances which may produce unusual bodily or mental perturbation—by sudden, or unusual, or excessive, or prolonged physical or intellectual exertion—by bodily or mental shock—by exposure to cold

or wet — by suppressed perspiration, or secretions or discharges — by excessive anxiety or injured feelings, &c.

b. The molecules of mineral, vegetable, and animal substances, and acrid vapours, and other irritating matters inhaled by workers in quarries, in coal, copper, tin, or lead mines, by sculptors, stonemasons, dry grinders, millers, bakers, chemical manufacturers, *directly occasion*, and are extremely productive of, diseases of the lungs and respiratory passages of persons thus occupied, that generally shorten their lives. But, though pulmonary consumption, with its worst complications, is by far the most common disease (§ 221) in persons thus exposed, and is very often produced in them, independently of previous disposition, yet inflammations of the lungs or bronchi, or broncho-pneumonia, asthma, and pleuritis are by no means infrequent, and may either exist independently or variously associated, or may lapse into phthisis, and often independently of the scrofulous taint.

c. The offspring of parents subjects of disease of the respiratory organs from either of these causes is very frequently imbued with the scrofulous cachexia, although the parents may not originally have been so tainted, and are often subject to pulmonary consumption, although they have not been exposed to the inhalation of the molecules of these substances.

CHAP. XIII.

OF THE PREVENTION OF THE SCROFULOUS TAINT, AND OF TUBERCULAR CONSUMPTION.

i. THE PREVENTION OF THE SCROFULOUS TAINT, THE CHIEF SOURCE OF CONSUMPTION.

261. It is obvious, that the *prevention of a constitutional taint*, which is not limited to the individual thus tainted, but which is very commonly propagated to his offspring, in some one or other of its forms or contingent effects, is much more important than even the cure of these effects when they come under the eye of the physician; and it is equally obvious, that the prevention consists in the avoidance of the causes producing this taint — these causes

being fully exposed above (§§ 181, *et seq.*), with the implied object of enabling the medical adviser, or whoever is concerned in the matter, carefully to avoid them—this avoidance having reference to the parent or parents, and to the offspring for successive generations. By no class of diseases are the misconduct, the imprudence, and the want of judgment of the parents more severely punished than by this—by none so distressingly, hopelessly, extensively, and successively, until the tainted race is almost or altogether extinguished. Instances illustrative of the misery—of the numerous miseries—resulting from the thoughtless, the ignorant, the worse than culpable intermarriages of scrofulous persons, or even by the marriage of a healthy person with one who is thus tainted, crowd upon my recollection, and are too common—too well known to every one who may read this—to require enumeration. The subject is sufficiently illustrated by the calm consideration of every thinking mind. Several of the causes which I have discussed above require only to be known to be guarded against, and certain of them may readily be avoided by careful persons. Others cannot be avoided by those most concerned, or who are about to become their victims; but they may be altogether removed in some cases, by those who have the power of inflicting them.

262. *The Hygienic Treatment of Scrofula* should, however, not be limited to the careful avoidance of the causes above described, whenever this object can be attained; but be extended to the use of such rational means as may prevent the full development of the scrofulous taint, and of its consequences, in those who may evince it in any grade, in childhood or infancy, and more particularly in the children of scrofulous parents. If this latter *indication* be carefully pursued, and if judicious means be employed, much may be accomplished, especially if the tainted subject be early submitted to these measures.

The scrofulous cachexy, being perhaps more frequently derived from one or both parents than from causes operating during infancy, childhood, and puberty, it necessarily follows, that the prevention of it depends on the conduct of the parents:—1st, as respects their own constitution and health; and, 2nd, as regards the management and health of their offspring. The causes which I have fully described above as belonging to and impairing the constitutional powers of the parents should be avoided as completely as possible; for the very full exposition of these causes (§§ 182, *et seq.*) have been made with the object of preventing their undoubted effects on the offspring. The infants of parents whose constitutions

have been injured by the causes I have stated, should be suckled by healthy nurses, if the constitution and health of the mothers forbid this important maternal duty from being discharged by themselves. And in such cases, suckling ought to be very considerably prolonged if the milk or nurse continue healthy. Where this cannot be duly carried out, a portion of ass's milk, or goat's milk, varying in quantity with the circumstances of each case, should be added to the infant's food, and after weaning, or at a more advanced age, small doses of cod-liver oil may be given, on the surface of any suitable medicine containing a preparation of iron, as two or three drops of the tincture of the muriate of iron. As the growth of delicate children, the offspring of weak, old, or scrofulous parents, proceed, other preparations of iron, as the iodide given with the syrup of *sarzæ*, the ammonio-citrate, or the ammonio-chloride, or the tincture of the acetate, or the *ferrum tartarizatum*, or the phosphate of iron, may severally be prescribed according to circumstances.

263. A scrofulous and phthisical disposition has been attributed above, in some cases, to a syphilitic taint existing in either parent. In these cases, either where it is evident or suspected, and especially if former infants have died about or soon after birth, the *hydrargyrum cum cretâ* should be given so as to promote the excretions; or a few drops of the compound tincture of cinchona, containing half a grain of the bichloride of mercury in each ounce of this tincture, ought to be prescribed for the infant three or four times in the day; or the nurse should take the sixteenth part of the bichloride in a drachm of this tincture thrice daily.

264. The influence of food in infancy and childhood, in predisposing to scrofula and tubercular consumption has been shown above (§§ 200, *et seq.*). Therefore the food should be of a wholesome and digestible kind, consisting of a due proportion of animal, vegetable, and farinaceous articles; of a large proportion of new milk or of fresh butter-milk, in childhood; of ripe fruit, and of substances abounding in hydro-carbonous and protein principles. Recourse may also be had to milk boiled with mutton or venison suet. Attention should be directed to the due discharge of the digestive and excreting functions, and the diet ought to be directed with reference also to the temperature and to the climate, and to the amount of exercise, which should be active, regular, and taken in the open air, without being excessive. When the temperature is high or the climate warm, the diet ought to consist of farinaceous and vegetable substances, of fruits, &c., rather than of animal substances; these

latter, more especially butcher's meat, ought then to be taken in moderation—more generally in small quantities only.

Great care, especially as to food and clothing, should be taken of children at the periods of dentition and weaning. At these epochs, especially the latter, asses'-milk, milk boiled with suet, cod-liver or sweet oil on the surface of milk, or on any other suitable fluid, medicinal or other; the chalybeate preparations already noticed, small doses of liquor potassæ with tonic infusions, or of BRANDISH'S alkaline solution, or the solution of the muriate of baryta, especially in older infants or children—salt-water bathing, the temperature being adapted to the strength of the child—and warm flannel clothing over the whole body, are the most beneficial hygienic means.

265. The support of animal warmth, and the animal heat derived from a young healthy nurse, are most beneficial to delicate, and more especially to scrofulous infants, and the more so the younger the child. An emanation of organic nervous power, as well as of warmth, may be furnished from this source to the delicate infant. The lower animals afford this protection to their young until growth is considerably advanced; and yet the young animal which is most helpless in infancy, and requires this the most, is the oftenest deprived of it, or is allowed to remain no longer in the bosom of its nurse than when it is suckled. During the coldness or coolness of night, and often in a chamber very much below the usual temperature of the sitting apartment, the infant is often allowed to sleep in a cot altogether apart from the curtained and warmer bed of the nurse.

266. Change of air, or the migration from one locality to another, according to the circumstances of the case, the age of the patient, and the season of the year; removal from crowded towns or situations to a high, dry, and temperate locality; residence near the sea-coast, in a temperate and dry air, and on a gravelly or sandy soil; sea-voyaging in some cases; sleeping in large airy chambers; exercise in the open air, the enjoyment of light and sunshine during the waking hours, and limiting sleep to the hours of darkness, are generally of great service, especially in advanced childhood, and during the progress to puberty. Cold-bathing, particularly sea-bathing, the Turkish-bath, active frictions of the surface, a generous diet, with a due proportion of animal food, and regular meals, are also most beneficial in the early periods of life. Whilst these means are pursued, the digestive and assimilative functions should be promoted, whenever they are insufficiently performed, by sulphu-

reous and chalybeate mineral waters, especially those of Harrogate, both internally and externally; by stomachic and tonic aperients, as the compound decoction of aloes, with the compound steel mixture, or the compound infusions of gentian and senna; and the use of unnecessary stimuli or stimulating beverages, of pork and indigestible meats, of sugar and saccharine substances, should be avoided.

267. As puberty advances, the utmost care should be exercised in all matters which may affect the sexual feelings or desires. A proper superintendence of both sexes ought to be instituted, in order to prevent the tendency to masturbation, which is greater amongst scrofulous constitutions, at this epoch of life, than in others; and which, if practised at all, will certainly develope this diathesis into actual tubercular disease, especially tubercular consumption. A careful supervision should also be exercised, after puberty, in order to prevent attachments being formed between scrofulous persons, or between an individual of this diathesis and one who possesses a healthy constitution. This intention, however, will frequently fail; but where it is attempted amongst the well-informed classes, and the evils consequent upon the neglect of it are duly explained by members of the profession, it will receive attention, and the good results will ultimately become apparent.

ii. THE PREVENTION OF CONSUMPTION.

268. A town-life, especially a metropolitan town-life, if prolonged without change, is sooner or later followed, according to the circumstances of the individual, by etiolation, blanching, anæmia, cachexia, with all their consequences. These are hastened, in the higher classes, by want of occupation, by ennui, by late hours, and by numerous excitements and indulgencies; and in the lower classes by unwholesome or insufficient food, contaminated air, and unhealthy avocations. In both classes of society these consequences are hastened and heightened by depression or exhaustion of vital force, by the consequent impairment of assimilation and of healthy nutrition, and by the ultimate contamination of the circulating fluids and of the soft solids of the body, thereby developing various diseases according to the temperament and constitution of the individual, and to the activity and combination of various mental and physical agencies. Of these diseases, owing to the predispositions and exciting causes above described, the most common are the tubercular in their several manifestations, and the disorders of the respiratory passages. In all stations of life,

the prevention and the cure of these maladies in their earlier stages can be effected only by removal of these causes, by favourable influences, and more especially by change of locality and of the quality of the respired air, judiciously aided by suitable food, regimen, and medicine. The injurious influence of the causes and agencies just noticed are evinced most frequently, and most rapidly developed, in the early stages of existence, and often in a ratio according to the earliness of the stage; and the beneficial results of change and of the more or less avoidance of the several co-operating agencies, are manifested according as predisposing, concurring, and exciting causes are avoided and removed, and in proportion to the early and efficient adoption of change of locality or climate, and of its concomitant advantages.

Late hours, unnatural excitement, mental anxieties and fatigue, air contaminated by sulphurous and other gases, by animal and putrid effluvia, and by noxious exhalations, when exchanged for early hours, mental relaxation, amusement, exercise in the open air, and various other beneficial influences, not merely displace the injurious causes, but also tend to remove the effects which these causes had already produced. Change to the sea-side, or to a dry and temperate air in elevated localities, where contaminating agencies do not exist; but where the *oxygen* of the atmosphere is improved either by its combination with *ozone* as believed by SCHÖNBEIN, or by its more active condition as viewed by FARADAY, has a very remarkable influence on the human constitution, before the effects of the morbid agencies already exposed have advanced far, not only in arresting or impeding these effects, but also in preventing their occurrence by fortifying the constitution against their operation.

269. The full exposition of the *causes* of phthisis which I have given above, and which many readers may consider tedious and unnecessary, will not be viewed in this light when it is admitted that a knowledge of these causes, and of their modes of operation, is the most certain basis of rational means of prevention. By ascertaining the causes, and the ways in which they act, as far as they may be ascertained, we are enabled either to avoid or to counteract them. When we can neither avoid nor arrest the causes, we should endeavour to arrest or to palliate their effects, by means rationally selected and employed—guided by the lights of science, and by careful observation and induction. The great objects, therefore, of treatment are, in the first place, *to avoid and to counteract the causes of the malady*, and, secondly, when this end cannot be attained, *to arrest or palliate their effects*. The former constitutes

the *prevention*, the latter the *cure*, of the disease. But in the procession of morbid conditions from the first impression of the causes, there is an intermediate state between the operation of the causes, and the development of their effects in a manifest form, that requires the prompt recognition of the physician, and rational decision as to treatment. This state of incubation — of threatened or incipient phthisis — requires great acumen for its detection, and equal promptness for its arrest. For this state *measures of prevention* should be conjoined with *means of cure*, either predominating according to the circumstances of individual cases.

270. The *prevention* of phthisis is either *radical* and *efficient*, or *conditional* and *uncertain*. The avoidance or removal of the causes is required for the former; the counteraction or the arrest of their more immediate or early effects is all that can be expected from the latter: the one is *positive*, for the causes have not existed or acted; the other is *contingent*, for the causes have been present, have probably acted and produced their more immediate effects, the means of counteraction or of arresting these effects either succeeding or failing, as numerous circumstances may determine. Prevention thus may be divided into,—first, that which consists of the avoidance of all the causes of the malady; and, second, that which attempts the counteraction, or the removal of their more direct and immediate effects, before the malady is fully developed.

A. *The Efficient Prevention of Phthisis* consists in the avoidance and removal of the causes which predispose to, and directly occasion, the malady. Those which affect one or both parents, or which operate during the earliest epochs of childhood, have generally produced their effects upon the constitution before professional advice is obtained. The transgressions of the parent have already injured the offspring, and the scrofulous taint has either been communicated to, or generated in, the child, before efficient measures of prevention could be instituted. The remarks which I have offered on the prevention of scrofula (*see* §§ 261, *et seq.*) apply with equal, if not greater, force to the prevention of phthisis. Consumptive persons who marry are even more culpable in this than those who are imbued with the scrofulous diathesis, or who have been affected with external tuberculosis. The offspring of the former may be scrofulous, but the taint is more likely to be manifested in the form of tubercular consumption, whilst the offspring of the latter are more liable to external tuberculosis, although they may be attacked with phthisis, especially when the external malady has not occurred. When the *predisposition*, whether it be hereditary or occasioned by the habits or the diseases of the parents,

or by the management of infancy and childhood, has been produced, the radical and complete prevention of the malady can then rarely be effected, the best efforts to this end being merely conditional or uncertain. It is only by the avoidance of those causes which I have arranged under the head of *Causes appertaining to one or both parents*, aided by the removal of *those which usually act during the early epochs of life*, that the efficient or certain prevention of this disease can be expected.

B. The Conditional Prevention of Phthisis, although uncertain, should not be neglected. Where the predisposition, arising from either the constitution or the health of the parents, already exists, prevention may be hoped for, but it cannot be insured.—

a. During Infancy and Childhood the Hygienic precautions which were advised above (§§ 262, *et seq.*), are even more urgently required when tubercular consumption has appeared in the family of either parent, or when the causes mentioned under the first class of the arrangement have injured the constitution of one or both parents. For children thus circumstanced, a dry, pure, and mild air, considerably elevated above the surface of the sea; frequent change of air; clothing suited to the temperature and season; exercise in the open air; light digestible food, with strict attention to the digestive functions; a milk, farinaceous, and vegetable diet, with a moderate proportion of wholesome animal food, as childhood advances; but the milk of a healthy nurse, asses' milk, &c., during infancy, and the other means advised in the place just referred to, strictly avoiding the causes incidental to this period of life (§§ 264, *et seq.*), are severally of great importance, especially when aided by such other means as the circumstances of individual cases will suggest.

b. During Puberty and Adult Age, the causes of phthisis which have been noticed as most frequently operating in these epochs of life (§§ 199, *et seq.*) should be carefully avoided, especially those which relate to schools, sleeping apartments, &c. A strict surveillance ought to be instituted over youths of both sexes, in order to prevent the secret vices alluded to above (§ 222,) and their enormity should be represented to the delinquent, and measures taken to prevent the mental contamination from extending to others. The sleeping-rooms should be well ventilated; but their temperature ought not to be much lower in winter than that of the sitting apartments, especially for the delicate and predisposed. For these a physical and mental regimen should be enforced, aided by proper food and clothing; by change of air, preferably to a warm, dry, and pure air; by a course of Harrogate, or other sulphurous

mineral waters; by chalybeates in forms suited to the peculiarities of the case; and, where the predisposition is manifest, by travelling to and in healthy, warm, or mild and dry countries, as Syria, Upper Egypt, Nubia, South of Spain, or north coast of Africa, &c.; or even in the dry and cold climates of Canada and north of Europe.

271. These preventive measures are chiefly suited to the rich only; and to these especially hunting, riding, farming in a dry, elevated district, and field sports are remarkably beneficial. The selection of professions and trades for those who are hereditarily or otherwise predisposed to phthisis is attended by great difficulty. Agriculture and the out-door exercises which it involves are salutary to those who can adopt them. Gardening offers some advantages, but these are inferior to those furnished by other agricultural occupations. Poorer persons should become sailors and butchers: but the life of a soldier, even in the best circumstances, is very unfavourable to those in any way predisposed to phthisis. To such persons especially, and even to the most robust, several trades are most injurious. Sculptors, stonemasons, miners, millers, flax, wool, and cotton dressers and workers, weavers, tailors, bakers, milliners, dressmakers, and other needle-women are severally more or less liable to phthisis in consequence of their occupations: and so liable are "dry-grinders," knife, fork, razor, scissor, and needle-grinders, to tubercular consumption and other pulmonary diseases, that it has been said by Dr. C. HOLLAND that about one-fourth of those engaged in these occupations died every five years.*

* See on this subject what I have stated "*On Arts and Employments in relation to Disease*," Dict. of Pract. Med., vol. i. pp. 122, *et seq.* All nuisances, all dangerous and insalubrious establishments, especially in large towns, besides being productive of several other maladies, are liable to develope phthisis, especially in the predisposed. The government of this country has lately paid some attention to the due regulation of these, as regards the public health. In France, as Dr. WALLER LEWIS has recently shown, these establishments are divided into three classes, and before they are permitted to be carried on, certain authorisations and formalities are indispensable. In the first class are placed those establishments that must be isolated from private habitations, but not necessarily from the outskirts of a town; in the second are included those factories which do not rigorously require their isolation from habitations, but which it is important not to allow until assurance has been obtained that the operations proposed to be carried on in them are executed so as not to be a nuisance to the neighbourhood, and not to cause damage. In the third class are such factories as may remain without inconvenience near dwellings, but which should be subject to the surveillance of the police.

As regards the effects on health of various professions and occupations, it is shown by M. LOMBARD, that in 1,000 deaths consumption had furnished the following proportions, viz.:—Occupations with vegetable and mineral emanations, 176; with various dusts, 145; with sedentary life, 140; with workshop life, 138; with hot and dry air, 127; with stooping posture, 122; with sudden movements of arms, 116; with muscular

CHAP. XIV.

TREATMENT OF TUBERCULAR CONSUMPTION.

i. HISTORICAL SKETCH OF THE TREATMENT RECOMMENDED
BY AUTHORS.

272. It was remarked by Dr. YOUNG, one of the greatest of the many names that adorn the literature and science, not only of our profession, but of our country, in his learned work on "*Consumptive Diseases*," that although we may not obtain from the medical writings of the ancients any great variety of information immediately applicable to practical purposes, we may still feel a sufficient interest in the history of a science which deeply engages our attention, to induce us to inquire, how long the few truths which are fully established with regard to it have been sufficiently demonstrated. "When, indeed, a fact is once well authenticated, no accumulation of authorities can be sufficient to invalidate its credibility; yet we cannot help placing a greater degree of confidence in opinions

exercise and active life, 89; with exercise of the voice, 75; living in the open air, 73; with animal emanations, 60; and with watery vapour, 53. In manufactures the majority of workmen are affected with scrofula; this scourge marks the children and the youths with its scars, swellings, and deformities, and attacks more especially the weavers.

The women furnish more maladies and diseases than the men, partly owing to the comparative paucity of their earnings, from which it arises that the poor workwoman is ill-fed, ill-clothed, and ill-lodged. In one sense, indeed, not money, but the want of it, may be denounced as the root of all evil. So, in this case, "want is a bad adviser, and quickly triumphs over the weak resistance of a conscience without religious light to guide it." Debauchery, followed by excesses of all kinds, comes in to consummate the work of destruction commenced by distress. The worst occupations are those of needlewomen, or *couturières*, dressmakers, embroideresses, and *modistes*, from whose ranks the public women are largely recruited.

The separation of the sexes in workshops is a measure imperiously demanded for the moralisation of the working classes.

As to the healthfulness of employments, much depends upon whether they are carried on in the open air or in confined air. Consumption is twice as frequent in the first as in the second case; the latter group comprising occupations carried on in vast spaces well aerated, and in others which confine the workmen in close localities. In the latter phthisis is far more prevalent. The action of dusts on the lungs is in the direct ratio of the volume, weight, and consistence of their molecules. The inhalation of coarse particles is less dangerous than that of dusts finely divided, which penetrate more easily into the last ramifications of the air-cells. Dusts from hard substances cause a far greater number of consumptive cases than dust from soft bodies, or of ordinary hardness. The specific gravity of the dusts does not affect in any marked manner the production of phthisis. The order of the respective fatality of dusts is as follows: viz., 1. mineral; 2. animal; and 3. vegetable.—*Report, &c.*, by Dr. W. LEWIS.

which we are, for other reasons, inclined to adopt, when we are informed that they are sanctioned by the observations of the most respectable authors of every age.

It is necessary to premise that, until the commencement of the nineteenth century, the sub-acute and chronic forms of *bronchitis* were very generally described and treated as forms of *consumption*, and even as true *tubercular phthisis*; and that this want of precision in the diagnosis of these diseases led not only to a much greater diversity of opinion as to their treatment, but also to a marked difference in the reputed results of the means employed. The general misconception existing among writers respecting the precise nature and seats of bronchitis and tubercular formations in the lungs, and their consequences, should be kept in recollection in reading the following sketch; for it will then become apparent that much of the benefit produced by many of the means recommended was actually not manifested in cases of tubercular consumption, but in those of sub-acute, or asthenic, or chronic bronchitis. (See BRONCHITIS.)

It will also be manifest to the observing and experienced, that many of the remedies and of the modes of treatment advised by the ancients, as well as by the older physicians, are even now amongst the best that can be adopted, especially when it is considered that bronchitis or chronic inflammations of portions of the lungs, or even that both are often associated with the majority of tubercular cases; and that the acumen and skill of the modern physician are the best displayed by the employment, in suitable forms and combinations, of these means, which the experience of ages has sanctioned, and by their appropriate adaptation to those pathological conditions which modern science has ascertained—to the presence of tubercular deposits, or of bronchitis, or of partial broncho-pneumonia, or of limited pleurisy, or of the combination of two or more of these, or to the predominance of one or other of them. Although the older writers on consumption confounded the tubercular states of the lungs with bronchitis, and with chronic broncho-pneumonia, more especially with chronic bronchitis, and notwithstanding that the distinctions between these were not satisfactorily shown until recently, and are even now stated with a greater appearance of precision than the frequency of their complication in various and in varying grades of predominance actually warrant, the practical views of the ancient and older writers on consumption are, nevertheless, not much less deserving notice than those which have been promulgated often in an unsuited garb of ori-

ginality, in modern and even in very recent times. We who live in the increasing light of modern science, with all the appliances of recent art and discovery, should not condemn the results of the experience of those who have preceded us, and who have recommended means which close, felicitous, and perspicacious observation enabled them to employ with greater benefit than we may be able to obtain — the indications by which they were guided, as well as the beacons by which they were deterred, proving as salutary as those of which we now boast possession.

273. HIPPOCRATES frequently mentions tubercular consumption by the names *phthisis*, *phthoe*, and *empyema*, and states that the age most liable to it is from eighteen to thirty-five. He notices many of its most prominent phenomena; as the taste and appearances of the expectoration, the pain between the back and sternum, the frequency of *hæmoptysis*, the quick, wheezing respiration, the cough, the condition of the hair and nails; the sweats, *diarrhœa*, emaciation, pleural adhesions, &c. His treatment is not always consistent with itself, or with his pathological views. He advises caustics externally, emetics, purgatives in moderation, oxymel, milk diet, especially asses', goats', and mares' milk, warm from the animal; walking exercise; avoiding the extremes of heat and cold. In addition to these, several other, and often opposite means are advised in different parts of his writings, to which it is unnecessary to refer.

274. In the works of ARISTOTLE are to be found the earliest notice of the opinion that *phthisis* is infectious. He states that this disease makes the breath corrupt and offensive, and those who approach the diseased person breathe air vitiated by him. — PLAUTUS mentions resin and honey as being employed by the Romans for *hæmoptysis*; and DIOSCORIDES, the physician of CLEOPATRA, and the greatest writer on the *materia medica* in ancient times, recommends sulphur — a substance which has been employed in various forms and combinations with more or less benefit, even down to the present time. — ARETÆUS considers ulceration of the lungs as genuine consumption, calls it *phthoe*, and gives a good description of the disease. Most of the chapter on the treatment is lost, but in what remains milk-diet and sea-voyaging are strongly advised.

275. CELSUS states that, in genuine consumption, a long sea-voyage and change of climate are most advisable, if the strength will permit, and the climate of Alexandria is preferred by him. He remarks that the worst air for any disease is that in which it has originated. Amongst various other means he recommends

milk-diet, with garlic, onions, leeks, &c., with vinegar; farinaceous articles, occasionally some mild animal food; flour boiled with mutton suet, and some light and austere wines. He advises the cautery on various parts of the chest, and the ulcers not to be healed as long as the cough continues. He mentions several other remedies, as horehound with honey; the juice of plantain; garlic in wine; raw or soft eggs with sulphur; hyssop; turpentine boiled with butter and honey; carriage exercise: sailing on a long sea voyage. For hæmoptysis, he advises bleeding, cupping, wool wet with vinegar to be placed where pain is felt; a cool apartment, and rest. —The elder PLINY enumerates many substances as specifics for consumption, especially ammoniacum, a course of milk in the mountains, the juice of plantain, a linctus of betony with honey; goats' fat in gruel, or with honey and water, and a little rue, and various other means less rational.

276. The works of GALEN furnish many prolix and digressive discussions on phthisis. The expectoration of cretaceous concretions was first noticed by him. He believes in the infectious nature of the disease. He prescribes vinegar much diluted with water for the hectic; bleeding, an emetic, purgatives, frictions, baths, exercise, a mild opiate at night, and removal to *Stabiæ* for the advantages of the air and milk of that place. He remarks that the air of that place is dry, the pastures healthy, the hills of moderate height, three miles from the Bay of Naples, sloping gently to the west, and near to Vesuvius, which makes the air still drier by its volcanic heat, and defends it from the north-westerly winds. At *Stabiæ*, he says, that the milk of cows is used; but he considers asses' and goats' milk preferable, the former being lightest, the latter of an intermediate nature. In order to allay the cough and improve the expectoration, he prescribes frankincense, myrrh, saffron, squills, liquorice, mastich, tragacanth, &c., with syrup of grapes and honey. When the discharge is excessive, he employs opium and castor, or aloes, mastich, and saffron; or the juice of hyoscyamus with pepper; or a lozenge of *Scribonius Largus*, containing liquorice, myrrh, turpentine, and tragacanth; or sulphur, with cardamoms and cinnamon. Most of GALEN's prescriptions are copied from those of the physicians who had preceded him. Various modes of preparing the *diacodium*, consisting chiefly of syrup of poppies and honey, are given; and for dry coughs, iris with honey is recommended, and for hæmoptysis, roses, gum tragacanth, bole, linseed, and polygonum; and for the consumption consequent on it, iris with hyssop, bitter almonds, the juice of squills, with honey, southernwood, and various other substances.

277. CÆLIUS AURELIANUS gives a tolerably correct account of the disease by the name of phthisis or phthoe. The medicines he prescribes are honied water, fenugreek, iris, aristolochia, arum, and horehound; also fir-cones, with honey and liquorice; and diacodium with butter and honey. Sailing especially to a distant climate and reading aloud are also advised. He censures the use of emetics, and considers the cold bath dangerous. For hæmoptysis he directs astringent electuaries, and pomegranate with aloe, as advised by THEMISON. If the hæmorrhage continue in moderation, he prescribes blood-letting on the third day, as inflammation will then take place; but if the symptoms are urgent with dyspnœa, bleeding should be practised at an earlier period.—ORIBASIIUS gives merely an abstract of GALEN'S practice, and remarks that a milk diet is of more importance than all other remedies.—ÆTIUS makes a similar remark respecting asses' milk. He also recommends venison fat dissolved in soup, and caustics to the chest.—ALEXANDER TRALLIAN gives ripe fruit for the hectic of phthisis, especially grapes. When concretions are expectorated he employs a cooling diet; and for the cough the juice of lettuce with liquorice; and the diacodium for relieving thirst and excessive perspiration. He also mentions the hermodactyls and their combinations. In the writings of PAULUS ÆGINETA and ACTUARIUS, there is nothing beyond what is contained in the works of GALEN.

278. The *Arabian* writers exhibit no views of the nature and treatment of phthisis different from those which have been given by the Greeks. RHAZES, the most original of these, strongly recommends a milk diet, and fumigations from a mixture of orpiment, aristolochia, myrrh, styrax, and galbanum in equal parts, with a sufficient quantity of butter.—AVICENNA prescribes camphor lozenges; in the early stages bleeding; and generally a dry air, a milk diet, and sugar of roses. In all else he closely follows GALEN.

279. The medical writers of the fifteenth, and of the first half of the sixteenth century, follow the doctrines and practice of the ancients, with the exception of PARACELSUS. He recommends a powder for phthisis, containing crude antimony and crocus martis. He considers diet to be of the greatest consequence; and advises a bath to be tried containing a decoction of herbs with sulphur.—FUCHSIUS was the first to notice digitalis, but in a very imperfect way. FERNELIUS, whose reputation was high in the sixteenth century, praises asses' milk, and small bleedings for hæmoptysis; in all things he principally followed HIPPOCRATES. LOMMIUS notices

the infectious influence of the expectoration and breath in phthisis, and the hereditary character of the malady. The work of NICOLAS PISO is only a compilation from GALEN and other ancient writers. PROSPER ALPINUS merely states, in his work on the Diseases of Egypt, that phthisis is one of the endemic maladies of the country. FORESTUS was amongst the first to give cases in detail; but he professes merely to follow the doctrines and practice of GALEN. Among the means which appear to have been most beneficially used by him in consumptions are asses' and goats' milk; and sulphur with the white of egg. SCHENK notices the use of turtle broth, and snails fattened on sugar and flour for hectic; but his materials are chiefly compiled from other writers. Most of the remedies he mentions have been already noticed; but we find that AVENZOAR prescribed olive oil, RUBÆUS sulphuric acid, and J. G. SCHENK the balsam of sulphur, in phthisis. The voluminous writings of BALLONIUS or BAILLOU, a physician in large practice in Paris at the end of the fifteenth century, contain nothing more deserving notice respecting phthisis than a remark as to the frequent occurrence of the disease in those who have nursed others affected with it.

280. POTERIUS, a physician to the French court, struck out novel modes of practice in this disease, but kept the preparation of most of his chemical medicines secret. These, as far as they are known, seem to have been oxydations of tin, of mercury, of silver, of antimony, of gold, &c., with various other substances. He employed sugar of lead as a refrigerant; and a preparation which, under the name of the antihectic of POTERIUS, long enjoyed a great reputation. Dr. YOUNG states that this medicine appears to have consisted of two parts of tin and one of antimony, oxydated by means of nitre. He professes to have cured phthisis by giving five drachms of balsam of sulphur every morning with syrup, and the antihectic in the evening, sulphur lozenges and iris being held constantly in the mouth, with a diet of wine and animal food. The balsam of sulphur he recommends to be made with the oil of almonds, and given in milk; other oils make it too heating. SPRIGELIUS states that consumptions are more common in England than elsewhere, owing to the habit of confining the chests of females by tight dress; and that in Venice, where this habit does not exist, females are more healthy.

281. SENNERTUS, whose works were very generally confided in at the commencement of the seventeenth century, closely follows GALEN. He considers the debility, diarrhœa, &c., to depend, in

phthisis, upon an acrid or morbid secretion generated in the lungs. He prescribes many medicines, especially rhubarb, with infusion of roses and goats' whey; and he cautions against too copious evacuations of any kind. He advises an issue in one or both arms, if the debility and emaciation be not extreme. He remarks that sulphur was first recommended in phthisis by DIOSCORIDES; and he makes favourable mention of honey, roses, horehound, hyssop, &c. He quotes other authors in favour of guaiacum and ginseng. BONTIUS, in his *Medicine of the Indies*, gives a case in which he supposes that fragments of the bronchi were expectorated, but which are mere false membrane formed on the bronchial surface. For true consumption he praises his opiate extract of saffron, which he says stops bleeding, quiets the cough, and has alone cured many desperate cases. He also prescribes conserve of roses with poppy seeds and sulphur, and decoction of ginseng or of sarsaparilla. Verily there are much worse modes of treatment employed in recent times than those adopted by SENNERTUS and BONTIUS. TULPIUS furnishes nothing more deserving notice than the advantage obtained in a case of the disease by eating oysters daily.—FABRICIUS HILDANUS describes several dissections of phthisical subjects, and notices the complication of pulmonary with mesenteric lesions, and the presence of calcareous concretions in the lungs. He relates several instances of successful recourse to setons.

282. Our countryman BENNET, as VAN SWIETEN and DR. YOUNG very justly remark, has much surpassed his predecessors, and most of his successors also, as a writer on consumption, which he experienced in his own person. He pays marked attention to the breathing and the sputa, to the prognosis, and to the several contingent affections in the course of the disease. For hæmoptysis, leading to phthisis, he advises bleeding, warmth to the extremities, and bleeding from the feet in females, if the catamenia be scanty or suppressed. He recommends milk and milk diet, but prefers medicated whey, and reprobates the use of saccharine substances, as productive of an injurious fermentation. He considers the best expectorants to be those which contain resin and turpentine. BENNET also has recourse to frictions and fomentations, and to balsamic fumigations. These last should consist, in his opinion, of frankincense, turpentine, and styrax, with cinnamon, coltsfoot, and other articles, made into a powder or troche, and burnt on coals. He prescribes also mixtures of herbs, on which boiling water is poured, and the vapour to be inhaled by holding the head over the vessel containing them. Issues are much praised, and,

according to my experience, with very great justice. He directs them in various situations, according to the symptoms, and he considers that they may be kept sweet by using peas of orris root, and when the discharge should be promoted, he advises equal parts of hermodactyls and wax. He recommends Welsh flannel to be worn next to the skin, and not to be too frequently changed. Animal food, neither very fat nor lean, is allowed, and a gentle emetic is given when the stomach is loaded, and a decoction of sarsaparilla and other woods with ginseng is recommended for drink. If we except the recent employment of cod-liver oil in phthisis, in what, it may be asked, has the treatment of this disease been advanced since the appearance of the work of BENNET, by the voluminous writings of specialists and stethoscopists in recent times?

283. The continental writers of the middle of the seventeenth century afford very little information as to the treatment of phthisis beyond what was previously known. SILVATICUS confided chiefly in bleeding, issues, and sulphurated lozenges. RIVERIUS notices the infection of persons who had nursed phthysical patients. Among the many substances already mentioned he particularises guaiacum, Peruvian balsam, and the stomachic, and the diaphoretic gold, of POTERIUS.—BARTHOLIN furnishes nothing deserving notice further than that sitting apartments may be made, by suitable vapours or medicated effluvia, useful substitutes for a voyage to Egypt or other warm countries. SYLVIVS attributed phthisis to the existence of glandular tubercles, which, when in a state of suppuration, constitute the vomicae. For the cure of the disease he administers opiates, demulcents, and emollients, fumigations, decoctions of the woods, hermodactyls, &c. He praises balsam of sulphur, prepared slowly with oil of aniseed, and says that it facilitates expectoration and relieves the breathing. I can confirm his opinion. He considers the milk of sulphur to be much inferior to it. To promote the appetite he prescribes the elixir proprietatis, which is made of myrrh, saffron, aloes, sulphurous acid, and spirit of wine, digested together. The diet he allows comprises wheaten bread, broths, milk, yolks of eggs, biscuits, with a little generous wine.

284. GIDEON HARVEY gives a tolerably good description of phthisis, notices bleeding, and remarks that great caution is required in practising it. He prefers whey to milk, gives it liberally with conserve of roses, and mentions the imperatoria as being recommended to him for this disease. WILLIS remarks that the atmosphere of towns is not always unfavourable to consumptive patients, for he

has observed many have better health and less cough in London than in the country. He prescribes sulphur in all forms, several balsams, and tar-water. I have experienced the justice of these remarks. After bleeding he advises narcotics, the muscus pyxidatus, warm bathing, frictions, blisters, &c. DIEMERBROCK mentions the case of a person who was cured by taking goats' milk thrice daily for three months, without any other medicine. BONETUS furnishes some information as to the lesions formed in phthisical cases, but it is of a very loose and imperfect kind, chiefly furnished by former writers, many of them of little reputation.

285. Of the writings of SYDENHAM, which have been extravagantly praised, but which are now more justly estimated, Dr. YOUNG observes, that "among the practical writers on consumption he cannot be considered, even by his warmest admirers, as holding a distinguished rank." His pathology of the disease hardly deserves notice. For a confirmed consumption, medicines are, he remarks, of little use; but bleeding, mild purgatives and pectoral remedies may be tried, with incrassants or attenuants, according to circumstances. For the fever he gives refrigerants, asses' milk, emulsions and opiates. For hæmoptysis he directs bleeding, cathartics and the avoidance of animal food. Horse-exercise is very strongly recommended by him; and he states, that riding cures consumption as certainly as bark cures intermittents! Carriage-exercise is also praised by him. For simple cough he prescribes abstinence from wine and meat, for a few days; ten drops of anisated balsam of sulphur, taken occasionally on a lump of sugar; lozenges containing liquorice, alecampane, aniseed, angelica, iris and sulphur; and a linctus of oil of almonds, with syrup of capillaire and violets. If the cough be obstinate or attended by fever he orders bleeding and cathartics; and, if the patient becomes consumptive, ten drops of Peruvian balsam, three times a day, a decoction of bitter plants, riding being the chief remedy. G. HARVEY, after ridiculing the treatment of consumption proposed by his predecessors, concludes that there is a single cheap remedy which does wonders; but this remedy he conceals. The only remark made by him deserving notice is, that hectic is generated by the pus which enters the blood; for the disease is partly an affection of the fluids, and not, as has sometimes been supposed, of the solids alone.

286. The *Phthisiologia* of MORTON was for more than a century the basis of practice in consumption, although in all most important matters it was anticipated by the writings of BENNET. There remain, therefore, but a few topics deserving notice.

Chalybeate waters are considered by him as preferable to all other means for the prevention of the disease, especially in scrofulous constitutions; he directs them to be taken freely, either cold or warm. He considers catarrh to be the most frequent cause of phthisis; an infection sometimes to occur, for he believes that it may be communicated to a bed-fellow. When proceeding from this latter cause, he considers it to be most fatal. He recommends bleeding in the early stage, but views it as fatal in the advanced stages, and opiates for the cough with purgatives, as the aloetic tincture. After bleeding emetics are viewed by him as of great benefit, in the first stage, but they ought to be followed by opiates. He frequently prescribes his stomachic pills, consisting of aloes, myrrh, mastich, saffron, cloves, worm-wood, nutmeg, calamus, mace, rhubarb, musk, cardamoms, &c. In scrofulous and scorbutic consumption he recommends pills of gum ammoniac, with benzoin, balsam of Peru, and sulphur. But in all forms of phthisis, especially in the more advanced stages, he considers cinchona the great and general febrifuge. Several forms and complications of consumption are particularised by him as requiring different or additional means of cure. He says that, in asthmatic phthisis, opium is injurious, by increasing the dyspnœa; but that ammonia and the citrate of potass are most useful remedies. In the melancholic and hysterical phthisis, emetics, he avers, act like magic, and opium is particularly requisite. For phthisis complicated with hæmoptysis, after venesection and other remedies, he gives the bark in doses of a drachm every four hours. He remarks that calculi may form in the lung, may lie there a long time inactive, or they may act as foreign bodies. Consumption consequent on syphilis he considers to be of an asthmatic nature. Chlorosis often passes into phthisis, he justly observes, by imperceptible degrees, if not treated by chalybeates and purgatives. When he suspects internal ulceration, he gives from 20 to 30 grains of calomel every third or fourth morning, and the diaphoretic antimony at night. BRUNNER states that he "entertained strong doubts of the propriety of MORTON's practice of giving cinchona in hæmoptysis, till he found by experience that it succeeded where everything else had failed." (YOUNG, *op. cit.* p. 203.)

287. ETTMULLER recommends emetics early in phthisis, and a diet of milk and raw new eggs. BAGLIVI furnishes us with nothing novel, excepting that he supposes ipecacuan to be the best remedy for this disease, and for all hæmorrhages and discharges. WEPFER furnishes some of the earliest information as to tubercles. In his

observations on diseases of the head, he gives an account of an *endemic* consumption at Waldschut on the Rhine, where there is a cavern in which mill-stones are dug and wrought. The air is there always hot—even in winter, and a very fine dust floats in it. All the workmen employed in it become consumptive, if they remain a year, or even a shorter time.

288. STAHL'S opinions as to the treatment of phthisis are not worthy of his reputation. His remarks are chiefly directed to the non-efficacy of most of the means which had been advised up to his time, and many of his observations are just. He reprobates the use of balsams, opiates, expectorants, cinchona, myrrh, balsam of sulphur, &c., and confides chiefly in bleeding, and nitre in moderate doses. Asses' milk, he says, is fit only for asses. The too general or inappropriate use of these and other medicines—the universal employment of a medicine because it has been advised, or found useful in one or even a few cases, is mere empiricism. It is the appropriate exhibition of a medicine to inferred pathological conditions which constitutes rational practice. He remarks that females are more frequently consumptive than males; but they have a greater chance of escaping its fatal termination. He considers exercise on horseback, or in a carriage, to be the most beneficial remedy for phthisis. FULLER agrees with STAHL as to riding on horseback being most salutary in this disease, when “without fever or ulcer;” but he adds that “the patient must be a Tartar, and live on his horse.”

289. F. HOFFMANN, the rival of STAHL in reputation, fully discusses the treatment of hectic fever and phthisis. He remarks that hectic attended by indigestion may often be relieved by an emetic of ipecacuan, followed by a dose of aloes. If amenorrhœa be a concomitant, bleeding in the feet and deobstruents are prescribed by him. If mesenteric disease complicate phthisis, as often observed in children, warm bathing, nitre, sulphate of potass, and sal-ammoniac are recommended. In all hectic he considers milk a principal remedy, especially woman's milk, asses' milk, goats' milk, or cows' milk, with manna or conserve of roses, or with seltzer-water. He also ventures to give the tincture or infusion of roses, cascarilla, cinchona, and nitre. He gives the muriate of potass when the appetite is weak. Bleeding, he says, should be practised with much caution. He adverts to a patient who was kept alive thirty years by losing some blood twice a year, and drinking a decoction of ginseng and sassafras. The treatment which he more especially advises for phthisis is somewhat similar

to the foregoing. He thinks justly that, where a predisposition to the disease exists, it may be called into action by attendance on a consumptive patient. When a milk diet occasions acidity, he substitutes whey; with which, or with milk, mineral waters, or lime-water, may also be mixed. He considers the best laxatives in phthisis to be manna, magnesia, rhubarb, or senna taken in milk; and milk or whey with parsley-seeds, or celery-seeds, to be the best diuretics. He is not favourable to the use of gum-resins or balsams, if they occasion, or if given during, febrile action. Myrrh, saffron, copaiba, opium, honey, wax, spermaceti, and oil are viewed more favourably. In the young and plethoric, small and frequent bleedings, air, exercise, and warm baths are, he believes, the best prophylactics. He considers half the cases of consumption to originate in hæmoptysis, and he advises that the bleeding should not be stopped too soon by astringents. In advanced cases, bleeding to the amount of an ounce only, often relieves the breathing. He says that emetics and strong cathartics are injurious. He makes favourable mention of issues, and of a stomachic elixir, composed of myrrh, saffron, nutmegs, and buckbean, which is to be taken at meals, consisting chiefly of milk diet, broth, and ptisan. For the colliquative perspiration he gives nitre and opium in small doses. He often prescribes also sulphur and diaphoretic antimony; and the combination of milk with mineral waters is much praised by him. It will be seen that the treatment adopted by this great physician is, in most respects, of great excellence, and when employed appropriately to the circumstances, form, and stage of the malady, by no means inferior to any adopted at the present day.

290. MUSGRAVE was the first to point out the connection of phthisis in some instances with irregular gout. The treatment he advises is not materially different from that recommended by BENNET, HOFFMANN, and others. BOERHAAVE furnishes no information as to the treatment of phthisis in any way worthy of his great reputation; his practical judgment appears to have been overlaid by his hypothetical doctrines. The respectable synopsis of ALLEN furnishes one very good suggestion, namely, the propriety of the liberal use of buttermilk in consumption. He also believes in the contagious nature of the disease in certain circumstances favourable to its operation. WHERLHOF comes to the defence of cinchona and MORTON against the attacks of STAHL. DOVER, in his ancient Physician's Legacy, appears in his heroic character of buccaneer in the treatment of phthisis. He advises a

frequent repetition of bleeding in small quantities, horse-exercise, crude quicksilver in large quantities, a substance much in fashion at the commencement of the eighteenth century; and aniseed and crocus martis made into pills with the balsam of Locatelli, in the morning, and elixir of vitriol in the afternoon. He gives also his powder, which originally contained nitre instead of the sulphate of potash of the modern powder. He advises the antiphlogistic regimen.

291. P. DESAULT deserves notice for his having been the first to contend that tubercles in the lungs constitute the essence of consumption; that they are generally antecedent to hæmoptysis; and that ulceration of the lungs is merely an effect and not a cause. He adds nothing to what has already been stated as to the treatment. JUNCKER, the methodiser of the doctrines of STAHL, furnishes but little information respecting phthisis, and almost none deserving notice, excepting his approval of riding, and his disapproval of warm balsams and aloes. WAINSWRIGHT considers CHEYNE correct in concluding, that the quantity of blood is much diminished in hectic, and thinks that pectorals and balsamics are injurious, unless they serve as stomachics and diuretics. He prescribes gentle emetics, mild stomachics, riding, pure air, frequent blisters, and a light, digestible diet. Dr. THOMSON is in favour of small doses of antimonial wine in consumptions.

292. Dr. HUXHAM's reputation induces a desire to know his practice in phthisis. He remarks, that catarrh occasions this disease only when tubercles had previously been formed in the lungs, and that the malady may be fatal before an ulcer is formed. Instead of sweet, oily, emollient, and other substances, which often disagree with the stomach and occasion acidity and diarrhoea, he employs gentle diaphoretics, blisters between the shoulders, mild cathartics with anodynes interposed, the decoction of cinchona, with guaiacum and styrax, and inhalations of drying fumigations. He advises those of a consumptive tendency to remove into the country in the spring, and to lose a little blood as a precaution. RUSSELL's work on glandular decline is of some importance as recommending a remedy within the reach of most persons, and one of great efficacy when judiciously employed, namely, sea-water, especially when taken internally, warm or cold, according to the circumstances of the case. He employs it also externally, at different temperatures.

293. Dr. MEAD insists on the intimate connection of phthisis with scrofula, and considers that the use of bark in the disease is

indicated by the periodicity of the attendant fever; but he believes it to be injurious when the lungs have become ulcerated. Goats milk and whey are recommended; and when milk disagrees with the bowels, it may be boiled with roses, pomegranates, and cinnamon, with the addition of water. The fumigations advised by BENNET, change of climate, a voyage to Naples or Lisbon, are severally noticed with approbation. Dr. BRYAN ROBINSON praises emetics, especially those with ipecacuan, in hæmoptysis, and adduces evidence of their effects. Dr. HORSBURGH gives some cases showing the benefits produced by the aluminous chalybeate spring, the Hartfell Spa near Moffat, at an advanced stage of consumption.

294. Dr. GILCHRIST adduces numerous cases showing the great advantage accruing from sea voyages. He considers hæmoptysis a consequence of tubercles previously existing, and remarks that there are still tubercles to be resolved, even after ulceration has taken place, and hence the difficulty to give appropriate remedies for every stage in which tubercles may be found; but that sailing and sea air appear the best calculated to fulfil all the indications. On a rocky coast, where the inhabitants live much on shell-fish, he observed consumption decidedly more rare than in the country inland. He considers that the practice in this disease should consist in a proper administration of bleeding, issues, mercurials, balsams, diet, sea voyaging, and sea air.—The practice of Dr. MARRYAT has been very generally adopted, at least in many of its parts, until modern times. He strongly objects to bleeding in consumption, and recommends a nourishing diet, especially of pork broth, and exercise on horseback, but above all the “dry vomit,” consisting of a grain of tartar emetic, with three of ipecacuanha, to be taken fasting twice or thrice a week, without drinking after it. If there be diarrhœa he directs a grain of sulphate of copper with four of ipecacuanha. If ulceration exist, he gives twenty drops of copaiba in sugar night and morning. For hæmoptysis he gives his emetics in increased doses. Bark, nitre, sulphur, chermes mineral, and alum are also severally employed according to circumstances. For scrofula he prescribes corrosive sublimate, with the addition of a few drops of the hydrochloric acid, &c.

295. There are few topics connected with the treatment of phthisis more important than that respecting the employment of opium, and to this TRALLES has devoted much attention, in a prolix and discursive work, in which the general treatment of the disease also is fully discussed. He considers opium to be useful in

the first stage, but to be injurious afterwards. He thinks that it is not even a palliative. He, however, gives it in enemata with decoction of bark and milk, for the palliation of the colliquative diarrhoea, and admits that it is useful in small doses when the cough is violent, for which also he gives the syrup of poppies. He recommends PLUMMER'S pill, ammoniacum, soap, squills, and honey, milk diet, milk with lime-water, emulsions, and farinaceous substances. The works of MORGAGNI furnish no precise information as to either the morbid anatomy or the treatment of pulmonary consumption, beyond what was previously known. Of the other contemporary writers on medicine there is none who gives any information respecting the treatment of consumption deserving notice, until we arrive at the works of Sir JOHN PRINGLE, DONALD MONRO, and others.

296. The observations of Sir JOHN PRINGLE deserve the high estimation in which they have always been held. In recent coughs he gives, after bleeding, mucilages, oils, and ammonia, in the form of an emulsion; and at night laudanum with oxymel of squills, or gum ammoniac. When the symptoms assume the form of hectic, he repeats the bleeding, recommends low diet, and the employment of setons or issues, which he justly considers still more beneficial than bleeding. If thirst or heat be great, acidulated drink, or buttermilk, without animal food, are advised. To check the sweats he uses sulphuric acid, or lime-water, conserve of roses, air, exercise, a milk and vegetable diet, and where there are debility and lowness of spirits, the bark is recommended.—DONALD MONRO appears to have adopted the practice of PRINGLE in phthisis. He has recourse to bleeding when there is pain, and to cinchona when neither pain nor difficulty of breathing is experienced. Setons and issues, he says, are always of use. A gentle emetic is advised for difficulty of breathing. For diarrhoea rhubarb and afterwards opiates are given.

297. LIEUTAUD, in his Synopsis of Medical Practice, considers bleeding injurious, and advises chiefly a milk diet, with pectoral decoctions, balsams in small doses, sulphur, tar-water, or MORTON'S balsamic pills, the fumes of balsamic herbs, the waters of Bonnes or seltzer, or lime-water mixed with milk, riding, issues between the shoulders. For the consumption produced by hard study, he prescribes camphor with HOFFMANN'S anodyne, baths, frictions, change of air, horse-exercise, and generous wine. LINNÆUS suggests the use of the lichen pulmonarius in phthisis. The Lichen Islandicus was known to earlier writers, according to Dr. YOUNG,

although it is not mentioned by LINNÆUS. Mr. READ lauds a residence in a cowhouse in cases of consumption, and says that it is preferable to any fumigations. The recommendation of a medicine called the decoction of a thousand flowers, which was much used from two to three centuries ago for the different forms of consumption, is more rational than this singular residence. This decoction, or infusion, as sometimes prepared, was made from the recent dung of cows, whilst feeding in open pastures, warm or cold water being mixed with it, and allowed to stand a considerable time, and the clear fluid being poured off for internal use. The bile existing in the dung was thus partially extracted, and employed as a stomachic.

298. The works of HEBERDEN, SAUVAGES, and FOTHERGILL, furnish no additions to the method or means of treating phthisis already known. STOERCK is extravagant in his praises of hemlock in this disease. VAN SWIETEN, in his commentaries on the aphorisms of BOERHAAVE, observes that persons exerting their voice in their professions are more liable to hæmoptysis than others; and that MOLIERE died of an attack of this disease immediately after performing his "Malade Imaginaire" for the fourth time. He believes in the communication of phthisis by infection, and considers that an hereditary disposition to the disease does not necessarily imply its actual existence. He approves of camphor as prescribed by AVICENNA (§ 278.), and of the treatment adopted by PRINGLE. He praises the use of milk, small but frequent bleeding, horse-exercise, the cautious employment of cinchona, and of opiates. For relief of the diarrhœa, he directs an enema of a drachm of turpentine, rubbed down with yolk of egg, adding half an ounce of theriac, and four ounces of new milk.—The treatment recommended by MACBRIDE is, in most respects, the same as that already so frequently noticed, namely, gum ammoniac, soap, and ammoniacal iron, early in the disease; gentle emetics to promote expectoration and relieve dyspnœa; bark, in some cases, goats' whey, asses' milk, buttermilk, seltzer, Bristol, or Malvern waters; riding, and especially sea-voyaging, setons, or issues, &c. For hæmoptysis, he directs bleeding, opiates, and demulcents. WINTERINGHAM disapproves of fumigations, as prescribed by BENNET and MEAD, but thinks that the steam of hot water containing vinegar of squills may be inhaled with advantage.

299. Dr. JAMES SIMS, the founder of the Medical Society of London, is favourable to emetics, to sulphur, and to cinchona, suitably employed. Tar-water is also useful, but he considers tar-

pills to be preferable. The following remarks are correct:— Females not uncommonly have a respite from consumption when they marry, but sink under the disease after having had two or three children. The catamenia may remain natural till the last stage, but this, I may add, occurs only occasionally, and chiefly in the more chronic and protracted cases. SCHOENHEYDER employs the decoction of Iceland moss, especially in phthisis consequent on measles, or after the removal of inflammatory symptoms. TODE very judiciously gives the bichloride of mercury in the infusion of cinchona, with Iceland moss, and a milk diet, in syphilitic consumption.— Dr. MOSES GRIFFITH is deserving of notice, chiefly for his recommendation of chalybeates in consumptions, and more particularly for his *Mixtura Ferri Composita*. This mixture is, however, varied by him according to the circumstances of the case; adding nitre in young subjects and recent cases, myrrh at a more advanced stage, and when there is more debility. He further advises a diet of asses' milk, or skimmed milk, puddings, rice, potatoes, and a little light animal food, once a day, and above all snail-broth, or snails boiled in milk. LINNÉ reports favourably of the *Hypericum perforatum*, in hæmorrhagic and ulcerous phthisis, a handful of the tops of the plant being made into a decoction with Spanish wine, boiled down to one-third, and an eighth taken morning and evening.

300. The treatment adopted by CULLEN for phthisis was generally followed in this country until early in the present century. When expectoration of purulent matter, with hectic fever, is present, he believes that ulceration exists. He views catarrh as rarely a cause of phthisis in persons not predisposed to this disease, but it ought not to be neglected. Spasmodic asthma not unfrequently terminates in phthisis. In two cases of the expectoration of chalky concretions, the patients recovered by the aid of milk diet, &c. Consumption from hæmoptysis is less universally fatal than other forms. "Hæmoptysis is not always followed by ulceration, nor is ulceration always attended with hectic. Pregnancy retards the symptoms, but they generally recur and become fatal soon after childbirth." In the hæmorrhagic form of the disease he thinks the acetate of lead dangerous, and chalybeates and cinchona improper, as tending to increase the phlogistic diathesis, and as having been found injurious in his practice. He prefers evacuations of all kinds, a low regimen, and blisters to the breast or back, followed by issues. Sea-water, and other mineral waters are wholly useless, and mercury is prejudicial. Milk is a chief remedy;

and violent exercise, and the extremes of cold and heat are to be avoided. He thinks that sea air is desirable only for its moderate temperature; that the balsams, myrrh, &c., have sometimes done harm; that bark increases the phlogistic diathesis, and even when it relieves for a time, the symptoms speedily return; that acids are useful, especially vegetable acids; that opiates are necessary for allaying the cough, but they often increase the sweats; that demulcents frequently disagree with the stomach; that the diarrhoea requires astringents and mucilages, and that all purgatives are dangerous, but ripe fruits are often both agreeable and beneficial. M. BRILLONET records cases illustrating the connection of tubercular phthisis with scrofula, and the successful treatment of the former by small doses of corrosive sublimate, and by a diet of soup, eggs, and vegetables.

301. STOLL offers some judicious observations, although others are more open to objections. For tubercular hæmoptysis he advises small and repeated bleedings; gentle emetics; acids and nitrous drinks, and afterwards lichen, polygala, senega, or cinchona. For hectic diarrhoea he gives the powder of the root of arnica. He disapproves of balsams, bark and astringents, where there is any inflammatory complication.—BERGIUS strongly recommends the Iceland moss in phthisis. When its tonic qualities are not required he directs the bitterness to be extracted by previous maceration.—Dr. MUDGE employs the inhalation of medicated vapours, for consumption. He believes hæmoptysis to result from the obstruction caused by tubercles; and for this state of the disease he advises nitre in solution; a moderate bleeding, and emetics; for cough the inhalation of emollient vapours, the ammoniacum with laudanum, or half a drachm of the anisated balsam of sulphur, a very large scapulary issue, if these fail, and a milk diet and vegetables. He reprobates the use of small issues, and advises them to be large and efficient—a recommendation agreeable to my experience.

302. Dr. SIMMONS notices the form of consumption produced by dry-grinding, or by breathing the minute particles of flour, sandstone, iron, &c. He considers the practice of bleeding to have been carried too far by DOVER. He prescribes nitre and camphor, myrrh with spermaceti; and oranges and ripe fruit in preference to sulphuric acid. Setons and issues, he says, are useful, opiates mischievous, and ripe fruit and antiseptics are the best remedies for diarrhoea. A little animal food, plainly dressed, may be allowed, if much desired. Change of air is advised; but, he

justly adds that migration to a warm climate, late in the disease, merely hastens death. Emetics of sulphate of copper, twice or thrice a week, in the early stage, preceded and followed by a draught of water, are also given with the vain hope of dispersing the tubercles.—The observations of HOME, DUNCAN, and REID furnish little or no information. The last named physician advised chiefly the exhibition of ipecacuan emetics, morning and evening, and considered sea-voyaging beneficial, mainly by producing nausea and vomiting. Verily his treatment seems to have been as bad as the disease. BORSIERI again thinks emetics injurious, and balsamic remedies hazardous; but he approves of bark in incipient cases, of camphor, and of balsam of tolu and turpentine in advanced stages. POUTEAU advises, when pain is experienced, bleeding, and cupping, and blisters.

303. Dr. STARK's posthumous observations contain the earliest correct account of the anatomy of tubercles. He is favourable to bleeding in the early stages, to oleaginous and demulcent medicines, and to vinegar of squills, &c., when cough and dyspnoea are urgent. RAULIN's views as to the treatment of phthisis are in some respects heterodox. He is more correct in recommending ipecacuanha in the catarrhal complications of the disease. He considers gums to be preferable to emulsions; and the preparations of cascarrilla to be appropriate for the sweats and for diarrhoea. Syrup of tolu with ptisans; and myrrh, camphor, and a little opium every night, are very generally prescribed by him. He praises opium in large doses for hæmoptysis; and the mineral waters of Cauterets and Bonnes for convalescents. Dr. WITHERING, in 1785, in his account of the foxglove, notices the recommendation of this medicine by Mr. SAUNDERS in consumption, and states that he found it of advantage in several cases when it was given in a decided manner. Dr. DARWIN, however, is doubtful of its good effects; and Sir G. BAKER is of opinion that its influence in phthisis is owing to the sickness it occasions.

304. Sir G. BLANE considers the best climate for the consumptive to be between 30° and 40° north latitude. VOGEL prescribes the vegetable acids with gum arabic; and, for phthisis after fevers, the taraxacum, bitter extracts and horehound, or the cold infusion of cinchona with rhubarb, if inflammatory symptoms be absent. The cold infusion of bark he gives most frequently with acids or nitre, or made with whey, and preferably during the remissions of the hectic. He agrees with SIMS as to the use of oysters as an article of diet. QUARIN considers emetics unsafe in phthisis; he

gives bark with sulphuric acid for the sweats ; Spa water with milk in preference to seltzer water ; and the senega when the expectoration is difficult. Dr. MOSELEY believes that England furnishes change sufficient for an invalid ; but that a voyage to Madeira early in the disease may be of advantage. For hæmorrhagic phthisis, and pulmonary oppression, he prescribes a vitriolic solution with the sulphates of zinc and alumina as an emetic, instead of bleeding, followed by a sea voyage.

305. Dr. MAY states that, in a well-marked case of phthisis in a young person of a scrofulous constitution, the patient took laudanum night and morning, an ipecacuanha emetic when the stomach was loaded, and cinchona ; and that the diet consisted of soup, meat, wine, porter, brandy and water, eggs, oysters, &c. with proper condiments. Swinging was employed twice daily, and horse exercise completed the cure. A similar case was published by Dr. KENTISH. I recollect meeting Dr. MAY in 1821. He argued strongly in favour of his tonic and nourishing method of treating phthisis, which then appeared heterodox, but which is now more or less adopted. Dr. GRIEVE notices his employment of koumiss, a fermented liquor made from mare's milk, in the early stage of phthisis. The fermented whey of cow's milk, and butter-milk, both fresh and fermented, are used as a popular beverage in this disease in Norway and the Orkney and Shetland Isles. Dr. CRICHTON gives a favourable report of the Iceland moss in cases of phthisis uncomplicated with inflammation. BANG of Copenhagen recommends the oil of asphaltum, in doses of eight drops morning and evening in rye broth. The pneumatic treatment, first tried by FOURCROY, and more fully discussed and employed by BEDDOES, furnishes no satisfactory results. Dr. SENTER, U. S. prescribes emetics of ipecacuan and sulphates of copper, every second or third morning, without eating or drinking, and as much of GRIFFITHS's chalybeate mixture (§ 299.) as the stomach will bear in the intermediate time. For children especially, ipecacuanha or the sulphate of zinc is a preferable emetic. A milk diet is also directed.

306. The second volume of the "Medical Inquiries" of Dr. RUSH of Philadelphia contain some of the most important observations on consumption which appeared towards the close of the last century. He was himself subject to consumptive symptoms during a considerable portion of his life,—a circumstance which imparts additional weight to his advice. He recommends, upon the first indication of the disease, or as soon as heat in the hands, weakness of the eyes on wakening, dryness of the feet, inactivity, and other

slight febrile symptoms appear, the patient to have recourse to a more active life, with bathing, bark, and steel. When the pulse is hard, with pain or bloody expectoration, he directs frequent bleedings, and where bleeding cannot be employed, emetics and milk diet. In the last, or typhus stage, as he terms it, he considers that a temporary benefit is derived from balsams, horehound, vegetable tonics, bitters, cinchona, &c., the diet being now stimulating and nutritious. He believes damp situations injurious in all states of the disease; and a high, dry, and temperate residence, *remote from the sea in all cases* most beneficial. He advises also flannel always to be worn next to the skin, the dilute vapour of tar, or the smoke of resin to be inhaled, opiates to be given in small doses during the day, and more largely at night, and repeated blisters and small issues to be employed. He admits of a moderate exercise of the lungs in speaking, reading and singing; and a gradually increased exercise of the body, especially of the limbs.

307. Dr. GREGORY, of Edinburgh, in his lectures, considers mercury injurious, cinchona of little use, and myrrh of less. The mineral acids he views as palliatives only, and as inferior to the citric acid. Emetics are sometimes useful, even without operating powerfully; sulphur is liable to be too laxative, but beneficial nevertheless; and purgatives hazardous as either inducing or aggravating the diarrhoea.—Dr. FERRIAR finds digitalis with change of air of service in the mucous consumption (chronic bronchitis), and in checking incipient phthisis, when the patient is too weak to bear evacuations. The pneumatic means, so much and so sillily vaunted at that time, and like other means puffed, with their authors, into undeserved notice much more recently, he justly considers quite undeserving adoption.—Dr. GARNET introduced several chemical medicines into practice, about the end of the last century. He prescribes the sulphuret of potass, and powdered charcoal, in the florid state of consumption, and gives a drachm of each of these, four or five times a day, in warm water, with the effect of promoting expectoration and improving the other symptoms. I question, however, the ultimate good arising from medicines which “promote expectoration,” as I have too frequently seen them promote other more unfavourable symptoms.

308. In the writings of DARWIN, in which there is a mingling of hypothesis, fancy and poetical imaginings, with ill-assorted experience, I find nothing on the treatment of phthisis deserving notice, or at least nothing worth attention which had not been previously advised by many of his predecessors.—J. FRANK professes himself

an advocate for the tonic and nutritious treatment in phthisis proposed by SALVADORI, MAY, and others, though with much more moderation in the degree; and for palliating the urgent symptoms by opium, and endeavouring to relieve the debility by cinchona, lichen, milk, wine, exercise and nutritious food—a treatment, however, by no means admitting of general adoption.—Dr. BARTON mentions the *Arum triphyllum* boiled in milk as a remedy in phthisis, states that he has known only of one case of the disease cured by digitalis; and that he finds more benefit from emetics of sulphate of zinc than from other means.

309. Dr. FOWLER and Dr. FERRIAR relate cases of consumption cured by digitalis given as decoction or infusion; but it is not improbable that more benefit was imputed to the medicine than it really deserved, as most of the cases were characterised chiefly by hæmoptysis, and as those are often attended by prolonged periods of amendment. That it is, however, followed by some degree of benefit, especially early in the hæmoptysical form of the malady, appears from the testimony of BEDDOES, MOSSMAN, MACLEAN, SHERWEN, and others, although this position is denied by Dr. BREE. Dr. MAGENNIS' success with digitalis may be attributed chiefly to the very large doses, and to the early period of the disease in which he prescribed it.—BUSCH in his researches employs chiefly aconite, hemlock, henbane, and dulcamara, combined with either ipecacuan, chermes mineral, or honey of squills. He prefers the leaves of aconite to the extract, and gives two grains every two hours, increasing the dose to a drachm daily. Dr. BEDDOES insists upon the propriety of confining the phthisical patient to a temperature varying only from 60° to 65°, and believes that the muriate of lime is sometimes of service.

310. Dr. HEBERDEN considers asses' milk to be of use in allaying fever; decoction of bark and sulphuric acid in relieving the sweat; opium in quieting the cough and favouring sleep; bleeding to the amount of five ounces only, when pain is urgent; and the application of blisters when the pain is obtuse. He advises a vegetable diet chiefly, and the purest water for drink. Dr. THOMAS recommends an emetic every second or third day, especially in the early stage, GRIFFITHS' iron and myrrh mixture, and digitalis. Dr. TROTTER is favourable to cinchona and sulphur; and to digitalis with opium. Dr. WILSON considers sulphuric acid to be most efficacious in checking the sweats; and a demulcent mixture with spermaceti and a little laudanum most useful for the cough. He allows animal food in moderation; and the vapour of warm

water, in which onions have been boiled, to be inhaled in order to facilitate expectoration. Dr. BOURNE furnishes experiments on the use of the uva ursi in consumption, from which he infers it to be of service early in the disease, in doses of ten or twelve grains, twice or thrice daily, sometimes taken with a small dose of opium. The end of the last century, and the commencement of the present, abound with writings on the treatment of phthisis, many of them most inconclusive, some of them trifling or puerile, and nearly all of them deficient in precision of description, and in logical inference. Most of these are filled with discussions and cases proving and disproving the efficacy of digitalis, and commenting upon the operation of this medicine.

311. Dr. BADHAM, in 1808, was the first to distinguish between asthenic and chronic bronchitis and tubercular phthisis, the former having been generally viewed as varieties of pulmonary consumption, and thus confounded with the tubercular disease. A large proportion of the recoveries of cases which had been considered tubercular, were evidently cases of bronchitis. Several writers at this period added nothing to our knowledge, or placed before us the "crambe bis coctum," or rather decies coctum, of their predecessors. RUSSELL expresses a favourable opinion of bark, calumba, chamomile, sulphuric acid, and iron, with hemlock. But these require discrimination as to the cases in which they may be individually prescribed. He considers the virtues of hemlock to be much overrated. Both he and THOMSON state the muriate of lime to be without any efficacy. In the more purely serofulous phthisis he considers issues to be decidedly beneficial, and sulphuric acid and salines as preferable to cinchona in the early stage. BARTON and others in America employ the superacetate of lead with ipecacuan and opium in the hæmoptysic form of phthisis.

312. The remarks of Dr. PARR are upon the whole judicious. He advises the pain in phthisis to be pursued by blisters as it changes its place; emetics to be given chiefly in hæmoptysis, and without informing the patient, ipecacuanha being preferred; and mild diaphoretics in an early period. He considers balsams of use only when expectoration is checked by debility; myrrh occasionally of service as a slight tonic and sedative; hemlock to be preferable to opium in palliating the cough without occasioning sweats; cicuta and the seeds of hyoscyamus to be often useful; and digitalis to do more harm than good. Assafoetida is recommended for flatulency and as an expectorant. In the last stage, emetics and other means are quite inefficacious, or palliatives merely.—The work of PORTAL,

although interesting at the time when it appeared, contains very little of importance in respect of treatment. He considers the mildest food the best, and particularly new-laid eggs; and issues, setons and moxas, of service.—Dr. BUXTON furnishes additional evidence to that adduced by BEDDOES in favour of a regulated temperature in phthisis, of from 60° to 65° . Dr. SHEARMAN notices the connection of consumption with amenorrhœa, and observes that GRIFFITH'S chalybeate mixture has been more successful in females than in males, owing to this connection. There is much truth in this: early in the disease this mixture is advantageously conjoined with the compound decoction of aloes and conium, and even in more advanced stages, if it do not increase the severity of the cough.

313. M. BAYLE very justly referred many of the cases of imputed recovery from phthisis, to the circumstance of chronic bronchitis, or chronic pulmonary catarrh, having been mistaken for phthisis; and he described, with greater precision than heretofore, the structure of the tubercular deposits and the pulmonary and the associated lesions. The granulated form of this writer is merely the earlier stages of the disease, excavations not having taken place. In this state he advises, according to the features of individual cases, composing and emollient medicines, occasionally bleeding, blisters and issues; aconite, hemlock, henbane, nightshade, and opium, and, where the expectoration is very copious, balsamic and resinous medicines. In the state of ulceration, he employs medicated vapours, and external drains and revulsants of various kinds. In cases complicated with chronic bronchitis or catarrh, the lichen, with diaphoretics and balsams, is prescribed, or with bark, when there are well-marked rigors. Streaks of blood in the expectoration require lemonade or orangeade, and bleeding if the pulse be hard, blisters, if soft. As prophylactics, he recommends travelling, voyaging, change of air and climate, nutritious diet, anti-scorbutics, tonics, alkalies, muriate of ammonia, &c.; for incipient cases, repeated emetics, bitter and stomachic purgatives, a sea voyage, exercise, the sulphuretted waters of Bonnes, Cauterets, Bagnères, or Mont d'Or; and later in the disease, mild tonics, as the lichen, syrup of cinchona, &c.

314. Dr. WELLS contends that phthisis is much less prevalent in marshy countries and districts where agues are endemic, and advises that consumptive patients should be removed, at least for some time, to these places. He quotes several authorities and statistics, by both which the subject is placed in exaggerated points

of view. It is not yet satisfactorily proved that malarial situations are beneficial in either the early or the advanced stages of phthisis; at least the matter should be further investigated, as well as the assertion that places wherein ague is endemic, are free, or nearly free, from phthisis; inasmuch as the position is controverted by several more recent writers, although contended for by MARSHALL, WEEKES, HARRISON, and others towards the close of the last century and at the commencement of the present.

315. Dr. ROBERTS has endeavoured to discover a more effectual remedy for consumption amongst the active mineral salts and other substances, than those hitherto employed. He has, however, only to record the failures of his experiments, with the nitrate of silver, superacetate of lead and opium, sulphate of zinc, oxyde of zinc, alone or with myrrh; white oxyde of manganese (10 grains); arsenite of potass; black oxyde of cobalt (one to four grains); ammoniated copper, muriate of baryta, nitric acid, phosphoric acid, aconite, henbane, stramonium, belladonna, and toxicodendron.

316. Dr. A. DUNCAN considers hæmoptysis as often a salutary occurrence early in phthisis; bleeding with low living to have hastened death in many cases; emetics to be of use in promoting expectoration, but to be useless as respects the cure of the disease; and blisters to be of service in most forms of the malady. He believes that vegetable acids are more beneficial than the mineral or acetous; that digitalis is of little use, and that sea voyages are counteracted by the inconveniences and risks attending them; that bark, myrrh, lichen, or these with hemlock, are sometimes of service in scrofulous cases, but that the pneumatic practice is altogether unsuccessful; that the diarrhœa may be moderated by mucilaginous fluids and broths, melted jellies, rice, catechu, opium, &c.; that the inspissated juice of the common lettuce is one of the best substitutes for opium, and that the patient should take asses' milk, wear flannel next to the skin, and have walking and riding exercise.—Dr. SOUTHEY has remarked upon the frequency and infrequency of phthisis in different countries. He is in favour of the use of issues, of digitalis for hæmoptysis, of a regulated temperature, by means of a stove from 60° to 65°, of riding, sailing, and swinging, and of change of air, at an early stage, to Valencia, Hières, &c.

317. Dr. THOMAS YOUNG, in his able and learned work on consumptive diseases, has given an interesting account of the treatment of these diseases, and a full digest of the means employed for this purpose in this country during the first quarter of the present cen-

tury; and until the diagnostic method of LAENNEC and the pathological and numerical disquisitions of French writers allured the minds of practitioners to the neglect of rational therapeutical doctrines. Dr. YOUNG considers *bleeding* an important remedy at an early period of the malady, for the removal of inflammatory and congestive symptoms, and for obviating the suppuration and debility consequent on them. From six to twelve ounces of blood, he remarks, may be taken away with safety in every incipient case, and the operation may generally be repeated with advantage three or four times, at proper intervals; but to do more than this might justly be called an experiment which, however laudable in proper circumstances, is not to be recommended in the ordinary routine of practice. Dr. YOUNG was himself bled twice, by the direction of his uncle Dr. BROCKLESBY, and was in favour of small bleedings, to the extent of three or four ounces—locally, when there is pain in any part of the chest. He advises *purgatives* at an early stage, and considers that fears of promoting the diarrhoea by them at this period should not be entertained. He justly views *sulphur* as an excellent aperient in the disease, and especially when complicated with hæmorrhoids. Dr. YOUNG also recommends *emetics*, and prefers ipecacuanha, especially in cases of hæmoptysis, combining it with acetate of lead, or other means, according to circumstances. On *sorbefacients*, especially digitalis, mercurials and alkalies, he places very slight reliance, although they may be prescribed in some circumstances of the disease with advantage. *Epispastics* and *issues* are viewed by him much more favourably. He considers that the tendency to night sweats is not a just reason against the use of *sudorifics*, especially DOVER'S powder and antimonials. In *expectorants* he has little faith, although ammoniacum, squills, senega, myrrh, and ipecacuanha may be employed with benefit in some cases, in conjunction with hemlock and other *palliatives*. *Demulcents* and *narcotics* are prescribed by him in circumstances indicating their use, sometimes with balsams, the benzoic acid, &c. Of *astringents*, when required to moderate the secretions of the skin and of the intestines, the sulphuric acid is considered the best, especially when conjoined with aromatics and opiates; but he is also in favour of catechu, kino, the extract of logwood, with chalk mixture, or the compound powder of chalk.

318. Dr. YOUNG believes *cinchona* to be the most important tonic, and both its advantages and inconveniences to have been exaggerated. He has known it decidedly beneficial at the commencement of the disease, and he has never observed that it increased the

hectic symptoms at any period. Besides the powder, and the decoction, he has employed the cold infusion with Seltzer water, in his own case, as well as in others. He has had little experience of *chalybeates*; but he justly remarks that, when they can be taken alone, or with myrrh, as in GRIFFITH'S mixture, without increasing cough or pain,—effects which may also proceed from cinchona,—they are sometimes beneficial. The *diet* most favourably mentioned by Dr. YOUNG consists chiefly of milk and the farinacea, especially asses' milk twice daily, cows' milk boiled with soda water or lime-water, butter-milk, new eggs, vegetable and farinaceous articles. He has found milk boiled with mutton suet of great service. *Exercise* in the open air, riding, walking, &c., are also severally advised. *Change of climate* is recommended, and he considers that the remark of CELSUS, that the worst air for the patient is the air which has given rise to the disease, is founded on good sense.

319. Sir C. SCUDAMORE and M. GANAL may, finally, be noticed as having recommended the fumes of iodine, of conium, stramonium, of digitalis, of ipecacuanha, of hydrocyanic acid, of sulphuric ether, of solutions of chlorine in distilled water, &c., to be severally inhaled during the treatment of phthisis. They advise either of these in states of saturation, varying with the circumstances of the patient, and with the effects produced, to be inhaled into the lungs by means of watery vapour, at a temperature of about 110° or 120°. And they recommend the watery vapour to be medicated not only by one of these, but even by more, if one is not beneficial. In other respects their treatment presents nothing deserving remark. I have seen these modes of treatment adopted, and in a few instances have myself prescribed them, but in none with any advantage beyond mitigating the irritation in the larynx and trachea often attending the disease. I believe that the inhalation of those substances in a humid, or even in any form, can have little or no effect upon tubercular formations in the lungs; or, if any effect, it is more likely to accelerate the softening of the tubercles and the enlargement of cavities. The inhalation, however, of the fumes of tar or of creasote, or of the terebinthinates, very weakly diffused in the atmosphere breathed by the patient, is in some cases beneficial in impeding the advance of tubercles, or the formation of cavities, and in healing the surfaces of cavities which have been formed.

I have brought down the *Historical Sketch* of the treatment of phthisis to a sufficiently recent period. Notices of some more recent writers will appear in the sequel only in so far as they may furnish anything deserving notice.

In the course of the full consideration I proposed to devote to the *prevention and treatment of pulmonary consumption*, I have already stated the management and means which should be adopted to *prevent* (a.) the development of the scrofulous taint, in which consumption so frequently originates, and (b.) the occurrence of the malady in persons who are more manifestly threatened by it, either by hereditary predisposition or otherwise, I have also exhibited a rapid view of the treatment of phthisis recommended by the ancient, and many of the old physicians, down to recent times. It may appear to some that the historical view I have taken is more curious than useful. But the observing physician will agree with the remarks I have quoted from Dr. YOUNG, and even place a still higher value upon an acquaintance with the opinions and experience of those who have gone before us, in endeavouring to advance medical knowledge to benefit the community, and to alleviate the sufferings of humanity.— I have now to give the results chiefly of my own experience as to the means which appear the most appropriate to the several stages and states of this disease, conformably with the division above adopted (§§ 10, 11.).

CHAP. XV.

TREATMENT OF PULMONARY CONSUMPTION.

THE *treatment of phthisis* had certainly, up to a comparatively recent period, not advanced with the progress of science; and even in the present day, it has been more empirical than rational, and at best more eclectic than scientific. Recently, indeed, the oil of the *Gadus morrhua*, or cod, has been the most important addition to the means of cure; and it is now generally prescribed with varying, and often with great benefit—according to the stage, state, and peculiarities of individual cases, and to the other means with which its exhibition may be associated. For the introduction of this substance into practice, the profession and the public are under great obligations to Professor BENNETT of Edinburgh; for although it had been employed for rheumatism and other complaints many years ago, and both it and the oil of the *Gadus brosmia*, or tursk, had been used as a popular remedy from time immemorial, in the Zetland Isles, no recourse to it in this country

for pulmonary consumption had been attempted until it was advised by this able physician. Cod-liver oil was very soon afterwards prescribed in two cases which were then under the care of Dr. BAIRD and myself, but it could not then be procured in London, until Mr. MORSON obtained it for us from Hamburg. Since then I have prescribed it in many cases; and although it frequently failed, it was often of more or less service, and sometimes most beneficial; but, in order to maintain for it the amount of benefit it is capable of producing, it should be given in aid of, or associated with, such other remedies as the peculiarities of the case, the stage of the malady, and various other circumstances connected with the origin, and management of the case, and with the closest observation of the resulting effects, may suggest. In no instance, however, should it be prescribed as the only remedy; as in many cases it will either fail altogether, or produce little or no benefit; and, in many other cases, whatever benefit it may produce will depend as much, or even more upon the means with which it is associated, or upon the vehicle on which it is taken. In all cases, moreover, it should not be overlooked that there are other means of cure equally valuable with it, if judiciously prescribed, appropriately combined, and rationally aided by suitable diet, regimen, and change of locality and climate.

i. TREATMENT WHEN PHTHISIS IS IMMINENTLY THREATENED.

320. When phthisis is imminent, the measures of prevention already noticed (§§ 261—271), conjoined with others of a more strictly medicinal kind, should be adopted according to the predisposition, age, diathesis, and circumstances of the patient. The digestive and assimilating functions ought to be promoted by the usual means; and especially by change of air, by voyaging, by travelling in warm and dry countries, more particularly in those already mentioned (§ 270), by suitable clothing, and by attention to the temperature and ventilation of sleeping places. The preventive and curative influences of districts where malaria and the diseases which proceed from this source abound have been insisted on by Dr. WELLS and several of his contemporaries. He states that it was common for the consumptive in Flanders to remove to the marshy parts of the country. In Minorca, where agues are endemic, consumption, according to Dr. CLEGHORN, is very rare. Dr. SEQUEIRA states that in the marshy country of Alentejo phthisis is rarely seen. VOLNEY says that consumptive patients are frequently sent from

Aleppo to the sea-coast, where intermittents prevail. Other instances are adduced by Dr. WELLS in favour of his opinion; and, although it has been controverted by several writers, yet I believe, from several facts with which I am acquainted, that it is not quite devoid of truth.

321. In this, as well as in other periods of the disease, the clothing, especially that worn nearest the skin, should be warm, and the best suited to the preservation of the functions of this part of the frame. With this object flannel ought to be worn during the night and day; and the dress in females should be sufficiently high to protect the upper regions of the chest and the neck. Close cinctures of the chest, and steel supports in corsets are injurious. Due attention ought always to be paid to the digestive and excreting functions, and to the state of the uterine discharges; which are often more or less disordered in the states of the disease now being considered. In many instances cod-liver oil may be of service; in others, as well as in these, sulphuretted or chalybeate springs, or the Harrowgate mineral waters may be preferred, or a course of the one following that of the other. For females, the mixture ferri composita, and the decoctum aloes compositum, in varying proportions, according to the state of the bowels, are often of service, especially when the pulse is languid, the catamenia scanty or difficult, and when the cough is not increased or rendered hard or dry by these medicines. In these cases flannel drawers, in addition to the other articles of flannel clothing, and woollen stockings should be worn. In other circumstances, or when the natural secretions and excretions are not suppressed, the infusion, or a weak decoction, of cinchona, with a mineral acid; or other tonic infusions, with aromatics, &c.; or the tinctura muriatis ferri, either with or without the preparations of calumba, and an increased quantity of the acid, may be prescribed, and may even be made the vehicle on the surface of which the cod-liver oil may be taken. Confined positions of the body, the labours of the desk, and close application to either study or business, ought to be avoided; and a due restraint should be placed on the instinctive desires and passions. Mental and physical occupations ought to be pursued as much as possible in open and airy places and apartments, and in a temperature never lower than 60° nor higher than 75°; and they should not be such as to fatigue, but such as moderately or pleasantly engage the mind and body.

322. In this state, as well as in the preceding, and more particularly when the predisposition is marked, or the tubercular cachexia

manifest, warm or tepid salt-water bathing or sponging the surface of the body daily with a warm, tepid, or cold solution of common salt—the temperature and strength of the solution varying with the state of the patient and the effects produced—is often beneficial; but this practice should always be followed by rubbing the surface smartly with a rough towel, and by the constant use of flannel nearest the skin. Various medicated fluids or lotions have been advised as washes for the chest and neck, in the circumstances now being considered, as well as in the first stage of the disease. Of these, however, the most deserving notice are, weak solutions of the nitro-muriatic acid, of the pyroligneous acid, and tar-water, varying in strength with the circumstances of the case. This last lotion has been employed only by myself, the temperature of it, as well as of the others, being varied according to the feelings of the patient and the state of the air. Friction of the surface also should always follow a recourse to either of these. More robust persons may find the Turkish bath beneficial.

ii. TREATMENT OF THE USUAL FORM OF PHTHISIS.

323. *A. Treatment of the First Stage of this Form.*—The imminence of tubercular consumption may be viewed almost in the same light as the commencement of this stage; and the treatment advised for the former is altogether applicable to the latter, with various additional means adapted or modified to the circumstances of individual cases. When this stage has commenced, as indicated by the symptoms (§§ 13, *et seq.*), the question is no longer, Are tubercles already formed? This must be answered in the affirmative. But their development may be delayed or prevented by judicious treatment; or their absorption may even be procured, although this is a doubtful or rare occurrence. The great principle of treatment in this stage, as well as when the disease is merely threatened (§§ 320, *et seq.*), is to develop the powers of life, and increase the vital resistance to the further advance of the malady, without producing or augmenting febrile symptoms:—1st. By diet and regimen—by hygienic means. 2nd. By medical treatment. A selection of means belonging to each of these heads, appropriately to the peculiarities of the case, will frequently promote the assimilation of the chyle globules and of the colourless globules of the blood, by supporting or developing the powers of life.

324. *a. The food and regimen of the patient* are of the utmost importance in this stage.—*a.* The *food* has always been discussed,

questioned, dogmatically prescribed, and often pertinaciously persisted in, according to the doctrines of the day, and the views of prevailing authorities; and instead of accommodating it to the peculiarities of the case and to the effects produced by it, an indiscriminating mode of administering it has been too generally adopted. At different periods of medical history, and by different physicians, very opposite kinds of food have been recommended. Some have praised a milk diet; others farinaceous and vegetable food only; many a combination of both; some have allowed a large proportion of animal food; and even not a few have permitted the use of fat meats, and a rich, full, and nutritious diet. The praises of certain kinds of diet have often been accompanied by denunciations of all others. Thus the inexperienced, and those who treat a disease according to its name, and not according to the successive pathological conditions it presents, are bewildered, and an important part of the treatment is adopted and applied not more rationally than if it were drawn by lot, or were the turn-up of the die. Now, each of those kinds of diet, modified and added to, according to circumstances, is appropriate, and beneficial when suitably employed, and when aided by a regimen judiciously prescribed. The diet in this stage should always have strict reference to the regimen, which the situation and circumstances of the patient permit, and especially to the locality, temperature, and air in which he resides; and both diet and regimen ought to be directed according to his temperament and diathesis, to the states of vital power and vascular action, as indicated by the pulse and by the febrile symptoms, and to the indications suggested by existing local lesions.

325. When the disease is not ushered in by hæmoptysis, or by indications of active congestion, and especially when it is traced to depressing or exhausting causes, then a nutritious diet, animal food in moderate proportion, the white kinds of fish, boiled, with a squeeze of lemon, with little or no other kind of sauce, and shell-fish, especially oysters, may generally be adopted. The fresh livers of the cod, torsk, ling, haddock, and coal-fish, and the fresh oil of their livers, may be very beneficially used as sauce for these kinds of fish; or the oil may be taken in a more strictly medicinal form soon after a meal. In these and in similar states of the disease even richer and more nutritious kinds of food than those may be tried, and the effects carefully observed. I have often advised a frequent use of fat venison, in some cases, and the fat of lambs or of mutton, boiled in milk in others, with much benefit. In cases where this stage is characterised by little or no acceleration of the pulse, by despondency, by a poor state of the blood, and by absence

of sub-inflammatory or congestive symptoms, a dry and nutritious diet, or a more full and restorative diet; animal food, consisting of mutton, game, &c., and even wine or malt liquors in moderation, may be allowed, if exercise in the open air, especially horse exercise, short of fatigue, be regularly taken.

326. For persons of a fuller habit of body, or more sanguineous temperament than those just referred to, and especially when oppression, or constriction, or pain at the chest, or a dry, hard cough is complained of, the diet should consist chiefly of milk and of farinaceous and vegetable substances, ripe fruits, &c., and the antiphlogistic regimen should be adopted in every respect; but it should not be carried too far, especially in the scrofulous diathesis. In these cases, local depletions, issues, and other derivatives, as will be hereafter mentioned, should be employed according to the state of the pulse and other peculiarities of the case. For these, butter-milk, whey, and skimmed milk are excellent beverages and aids to diet. After the more inflammatory and congestive symptoms are removed, and when issues or setons have commenced to discharge, then a more liberal and nutritious diet may be allowed, and the cooling, antiphlogistic, and febrifuge medicines hitherto prescribed may be changed for those which are more restorative, and more calculated to support vital power and to promote a healthy assimilation. In these circumstances the fish diet as advised above (§ 325), may be first employed, and the more nutritious articles of food be afterwards given with caution.

327. *b.* In this stage, *change of air, voyaging*, more particularly in latitudes from 30° to 50° or from 10° or 15° to 30° in winter, in vessels possessing comfortable accommodations; *travelling* in temperate and warm climates, with due regard to the temperature and climate and to season; residence in a warm and dry air, the elevation above the surface of the sea, and the degree of atmospheric dryness being such as the patient finds to be most beneficial; regular exercise in the open air, preferably on horseback, and short of much fatigue; are severally of manifest advantage. Exercise on horseback is, however, rarely of benefit to females, and is generally too exciting, and consequently exhausting to them; walking or driving in an open carriage being more beneficial. In all cases, extremes of temperature, and sudden changes of vicissitudes of temperature must be avoided, even by those who are able to take active exercise, as well as by those who are much less able.

328. *Travelling*, at proper seasons and hours of the day, is generally beneficial, especially when the patient is able to travel on horseback. Travelling on land by other conveyances is less ser-

viceable ; although an open carriage, when the weather will admit, is little inferior to riding, especially in the cases of females. But, when a close carriage is used, the patient should sit with his back to the horses ; and when he travels by railway, this seat should always be taken, a sufficient ventilation of the carriage being always preserved.

329. *Tepid* and *cold-sponging* and washing the surface of the body, or the surface of the chest merely, with variously medicated lotions, have been advised in this stage ; but, excepting with those already mentioned, or with the lotions, liniments, and embrocations about to be noticed, this practice is seldom of much service when this period is far advanced, unless exercise can be regularly taken in the open air, and flannel be constantly worn nearest the skin. It is, however, beneficial when employed as a preventive measure for the predisposed, and for those of a tubercular cachexia ; and when adopted at the commencement of this stage, and followed by very active frictions of the surface.

330. *c.* A *winter residence* is of the greatest importance in this stage to patients in cold or temperate climates, for that residence should be selected which will admit of regular and daily exercise in the open air. But this is not the only consideration by which we ought to be guided. Elevation above the surface of the sea, a situation near the level of or close to the ocean, or removed at a distance from it, and frequent or prolonged voyaging on it, are severally topics which require to be duly considered. As to the last of these—*voyaging*—very well-founded expectations of success from it may be formed, if it be commenced in this stage, or before the second be far advanced, more especially in cases which have been attended by hæmoptysis at their commencement or early course, and if it be continued for a sufficiently long period. Voyaging in the Mediterranean or in the Atlantic between the degrees of latitude named above (§ 327), and preferably in the Pacific Ocean, especially when prolonged, either in naval cruisers, or by repeated voyages, so as to avoid the winter and spring of this and other countries unfavourable to consumptive patients, deserves to be more frequently recommended than it has hitherto been. Now that the passage across the isthmus of Panama is easy, voyages thence, in various directions in the Pacific Ocean, may be made, and a return to this country effected in May or June.

Elevation above the surface of the sea, especially in warm climates, and when dryness of air is attained by elevation, is generally beneficial. Even in temperate climates, where elevation is

conjoined with dryness, the diminished temperature which results is not so injurious as generally believed. The cold of Canada is not injurious to the consumptive, owing to the dryness of the air being great in proportion to the lowness of temperature. If such a residence admits of regular exercise in the open air, it may be salutary, although a warmer air, and an exemption from sudden atmospherical vicissitudes, may be preferred.

The only question connected with residence that remains to be considered is, whether preference should be given to a sea-coast or to an inland locality. This is a difficult question to answer; and judging from the indisputable advantages derivable from sea-voyaging, and the very frequent recommendations of places on the sea-coast by modern physicians as winter residences for the consumptive, it may be inferred that these places are actually the most healthy. But this inference is neither logical, nor practically correct as respects phthisical cases. The benefit derived from voyaging depends chiefly upon uniformity of temperature and the motions of the vessel, aided by the influence of a pure sea-air on the digestive and assimilating functions. Residences on the sea-coast furnish only two of these elements of benefit, in an imperfect manner, but they are altogether deprived of the third, and that which appears to be the most important. We must therefore refer to the results of observation for a decision; and, as far as my experience enables me, I may state, where two localities, one inland, the other on the sea-coast, possess equal advantages as to dryness of the air; as to annual, monthly, and daily ranges of temperature; and as to vicissitudes of weather, and facilities for out-door exercise, that the inland situation should be preferred.

Whatever be the locality adopted for the consumptive, or however the patient may be limited in his choice, exercise should not be neglected, in air and sunshine, whilst he is able to enjoy it; and the temperature of his sleeping apartment should not fall below 60° or rise above 70°. The advantages derived from stoves, when properly regulated, are shown by their preservation of the warmth of apartments at all hours of the night; but a due ventilation ought always to be preserved where they are the only means of keeping the temperature at a proper elevation. Having insisted upon regulation of *diet* and *regimen* appropriately to the pathological states of the case in this stage, and upon the advantages of *change of air*, of *travelling*, *voyaging*, and of *suitable residence* during the winter and spring months, the *means* which are more strictly *medicinal* are next to be considered.

331. *b. The strictly medical treatment* of the first stage of phthisis must depend entirely upon the diathesis, temperament, and habit of body of the patient, and upon the states of vascular action, of local lesion, and of vital power. The predisposing and determining causes should also be kept in view; for these should influence or even almost change our indications and means of cure,—*a.* In cases where vascular action is excited, or the pulmonary circulation is oppressed or congested, or where pain is felt in the thorax, or where hæmoptysis occurs without being very copious, neither anæmia nor vital exhaustion being remarkable, a small *bleeding* ought not to be either neglected or delayed. The only consideration is, in what manner may it be most advantageously resorted to. Venesection, unless the patient be very robust or plethoric, is rarely required. Scarification and cupping are to be preferred, as the circumstances are few in which this operation may not be efficiently performed, and a due quantity of blood withdrawn in a very short period, the operation itself generally proving a salutary derivative. When the quantity of blood to be taken is small, and in certain complications, the application of leeches may be preferred.

The quantity of blood abstracted at one time should be small, or at most not great. In the majority of cases it may vary from four to eight or ten ounces; this last amount being allowed only where the habit of body and circumstances of the case appear the most to require depletion. Time should be allowed to observe the effects of the first bleeding; and after a due interval, if the symptoms still continue, or upon the return of the indications for having recourse to it, the operation may be repeated. The amount and the repetition of the depletions should be determined only by the peculiarities of the case and the judgment of the physician. It will often be observed that even when bleeding appears to be required, it is but ill endured, although the quantity withdrawn has been small. When this stage is developed by the suppression of an accustomed discharge, as of the catamenia, or of hæmorrhoids, then the necessity of having recourse to vascular depletion is obvious, and that method of performing it which is most likely to re-establish the interrupted discharge should be adopted. Leeches may be applied around the anus when the hæmorrhoidal discharge has been suppressed; and beneath the groins when the catamenia are interrupted, difficult, or scanty; and, for both causes of aggravation, calomel, the preparations of aloes, and warm fomentations or the hip-bath, may be prescribed. The older writers advised bleeding

from the feet when immersed in hot water, in cases of catamenial obstruction, and this mode may be adopted by those who prefer it. I have sometimes prescribed it, and seen it employed with benefit.

332. Vascular depletion has been advised in the first stage of phthisis by some authors and reprobated by others. I have now stated many of the circumstances which require it; but there are others, more especially certain complications hereafter to be noticed, which also are benefited by it. But cases are common for which, even at an early period, bleeding cannot be ventured on with safety; or, if employed at all, it can be prescribed only to a small amount, and in the immediate vicinity of parts which appear to require it. The numerous class of cases caused by the depressing and exhausting causes mentioned above (§ 192, *et seq.*), by want, by misery, by debilitating discharges, by confinement and etiolation in factories, close apartments, &c., and by sedentary and ill-rewarded occupations,—those cases which present anæmied, cachectic, discoloured, and debilitated appearances, or in which the pulse is either slow and beneath the healthy condition, or very quick, small, or soft, or when the blood is inferred to be thin and poor in red globules,—are severally injured even by the smallest local depletions, unless they be prescribed for the removal of the pains occasioned by pleuritic complications, for which the additional and often more successful means hereafter to be noticed should be employed.

333. The indications for and against vascular depletion in an early stage of phthisis are, however, not always to be depended upon. Whilst many are manifest, others may be doubtful. Much, therefore, should be left to the close observation, the enlightened experience, and the acumen of the physician, in the interpretation of these indications and the discovery of others. The season, climate, peculiarities of race, modes of living, and prevailing constitution and character of disease, the prevalence of a sthenic or an asthenic condition of morbid action, are severally weighed in his mind before bleeding in any way, its amount and its repetitions, are decided upon, and before other important means are prescribed. The prevailing constitution of disease, so much insisted upon by SYDENHAM, differs most remarkably in different periods of time. The sthenic constitution, so general in the first quarter of the present century, was changed to the asthenic in the second quarter, and this latter still appears to continue. The vital energies of the residents in large cities and manufacturing towns, especially in low situations, are weaker than those possessed by the inhabitants of rural districts

and elevated localities; and these differences, with others manifested by individual cases, require due consideration when devising our indications and means of cure.

334. The necessity of having recourse to vascular depletions, especially to local depletions, when congestion, sub-inflammatory action, pain, the state of respiration or of cough, or other symptoms, require them, does not necessarily prevent the exhibition of nutrient and even of restorative means, more particularly when vital power appears depressed and vascular action is not much increased. Indeed, in large cities and manufacturing towns, these latter medicines, or even more tonic remedies, are often required, although local depletions are equally necessary for the local lesions. For these, milder tonics, conjoined with sedatives and narcotics, as the infusions of cheyreita or calumba, with hydrocyanic acid, or conium, or hyoscyamus, or the *tinctura camphoræ comp.*, may be first prescribed, and be followed, according to the effects observed by infusions or decoctions of a more tonic kind. When, with debility, a cachectic or an anæmied appearance is present, the preparations of iron may be given, commencing with the mildest. I have generally preferred the *mistura ferri composita*, with the extract or tincture of conium, or the powder or extract of liquorice; and, if the bowels be sluggish, and the catamenia be deficient, with a sufficient quantity of the *decoctum aloes compositum*, or *tinctura aloes*.

335. The effects of chalybeates of every kind require to be closely observed in this as in every other stage and state of the disease. This class of medicines is contra-indicated where any inflammatory complication exists, or where a tendency to hæmoptysis is observed, unless hæmorrhage has occurred to a large amount, when the *tinctura ferri sesquichlorici*, with additional acid and appropriate medicines, may be given in a suitable vehicle; but on all occasions the effects of chalybeates on the respiration and the cough should be strictly watched, and, if rendered more oppressed, difficult, or hard by them, they ought to be relinquished. I have often prescribed the iodide of iron, in syrup of sarzæ, or in other syrups, with conium; or some other anodyne; but I have not considered it more beneficial than GRIFFITH'S myrrh mixture, even in cases where the catamenia are deficient; and I have found it in some cases to aggravate the cough and tightness of the chest more than that mixture.

When the above medicines are either not indicated or prove inefficacious, the infusions of cinchona, prepared either with cold or with warm distilled water, may be prescribed with hydrocyanic acid,

or with any of the preparations of conium or hyoscyamus; and it may be taken in milk in which a little of the bicarbonate of potash, or of soda has been dissolved. When febrile symptoms harass the patient, the liquor ammoniæ acetatis may be given with the infusion of cinchona, and the spirit of nitric ether and hydrocyanic acid added to them. In some instances the liquor ammoniæ acetatis may be prescribed with an excess of acetic acid, especially where hæmoptysis occurs; and in others, particularly where sinking or exhaustion is present, with an excess of the carbonate of ammonia, other substances which the symptoms will suggest being also added.

336. In this early period of phthisis the functions of digestion—of both stomach and liver, are often more or less impaired; and it is often beneficial to them, as well as to the state of circulation in the lungs, to commence the treatment with an *emetic*. The older writers recommended this practice, and experience has shown that, when the emetic has been judiciously selected, and the treatment otherwise appropriate, benefit has been produced by it. The Italian physicians, and after them LAENNEC and his pupils, prescribed tartarised antimony as an emetic in this disease, having, as they believed, derived great advantage from it in the more strictly inflammatory diseases of the lungs; and not only did they employ it as an emetic, but as a contra-stimulant, and in doses which were seldom efficacious in reducing the febrile symptoms, but which rarely failed in reducing the vital powers of the patient. I frequently saw the effects of this substance whilst it was in vogue, and sometimes prescribed it; but I considered it of inferior utility to ipecacuanha and to sulphate of zinc as an emetic in phthisis, their operation being facilitated and increased by a draught of a weak infusion, tepid, of camomile flowers. Afterwards demulcents or emollients, or stomachics, with the addition of a little hydrocyanic acid, if the retching or vomiting be more than we desire, may be prescribed, and subsequently the other internal remedies which the features of the case will suggest.

The effect of the emetic early in this stage, and the repetition of it when the functions of digestion are disordered, will generally be beneficial, as shown by the appetite and the state of the evacuations, especially when followed by the medicines just mentioned, or by small doses of the nitro-muriatic acids taken in the tonic infusions already noticed, or in others which the state of the case appears to require. If the bowels become irritable, the tinctura camphoræ comp., or the pilula saponis composita, will correct the

disorder; the former being given in the *mistura cretæ*, or any other suitable vehicle or form of combination, the latter with small doses of *ipecacuanha*, and of an aromatic powder. If the biliary secretion be deficient, as not infrequently observed in this period, although the bowels are relaxed, PLUMMER'S pill or blue pill may be cautiously given, with soap and extract of *taraxacum*, instead of the nitro-muriatic acids; or these latter may be prescribed instead of the mercurial, an occasional dose of which should only be taken. In this stage of the disease the bowels are more frequently confined than much relaxed, and the intestinal secretions and excretions are very often more or less disordered. It thus becomes an important object to improve these secretions, and to regulate the function of defæcation. The medicines just named will often aid in attaining this end; but they should be either prescribed with other remedies, or followed by suitable laxatives or aperients, conjoined with vegetable tonics, stomachics, &c. I have observed great benefit result from either of the subjoined when appropriately administered or modified.*

These medicines are most suitable in cases devoid of any inflammatory complication, which, as occurring either in this or in subsequent stages, will be more particularly considered in the sequel. The objection of not being applicable to these and other complications cannot, however, be urged against equal proportions of *magnesia* and *sulphur* as an aperient in this stage, especially when rendered more agreeable by the addition of *liquorice* powder and a little *ginger*. Where this aperient proves too depressing, or where vital power and vascular action and assimilation are much impaired, a little powdered *cascarilla* may be added to the former, the whole being taken in some water.

337. *b. External medication* is a very important part of the treatment of phthisis; and, as will be seen from the historical sketch given above (§§ 272, *et seq.*), it has been considered such from a very early period of medical history. Probably external derivation by

* No. 1. *R.* — Pulv. *Ipecacuanhæ*, gr. viij.; *Extracti Fellis Bovini*, ʒij.; *Pilulæ Rhei* comp. (vel. *Pil. Aloes cum Myrrhâ*) ʒijss.; *Extr. Conii* (vel. *Extr. Hyoseyami*), ʒss.; *Saponis Castil.* gr. xij.; *Olei Anisi*, q. s. Contunde bene et divide massam in pilulas xxxvj. quarum capiat duas horâ somni. Vel:

No. 2. *R.* — *Extr. Glycyrrh.* ʒss.; *Tinct. Aloes* comp. ʒss.; *Tinct. Conii*, ʒj. (vel. *Tinct. Hyoseyami* ʒij.); *Decocti Aloes* comp. vss.; *Aquæ Carui* ad ʒviij. Misce. Fiat mist. ejus capiat cochl. ij. vel iij. amplâ horâ somni vel primo mane. Vel:

No. 3. *R.* — *Pilulæ Rhei* comp. ʒij ss.; *Pilulæ Scillæ* comp. et *Pilulæ Conii* comp. aa. ʒj.; *Saponis Castil.* gr. x. Contunde bene et massam divide in pilulas xxiv. Sumantur binæ hōra somni.

means of moxas was as early resorted to in eastern countries for this and other diseases, as by issues and setons among the Greeks and Romans; but there can be no doubt of the benefit to be derived from these and similar means in aid of judicious internal treatment and regimen. As it was in respect of internal, so it has been as regards external means, different kinds and various modes of prescribing them having been advised in successive ages, and those which had fallen into disuse having been revived from time to time, again to be neglected or forgotten. The moxas employed in far eastern countries from time immemorial came into vogue in Europe after the former were visited by voyagers and travellers from the latter; but failed in superseding issues and setons, which have always held their place, and deservedly, in the treatment of this disease, especially with the judicious and experienced. Early in the present century moxas came again into use in some places on the continent of Europe, and pustulation by means of tartarised antimonial ointment, or of croton oil, in this country; the latter means having so entirely superseded issues and setons, as to have caused the complete disuse of them. I have seen much of these modes of derivation, and have had considerable experience of their effects, both in phthisis and in other diseases. *Moxas* are of more or less use according to the amount of discharge which may be procured subsequently to their incandescence; but their operation is uncertain. Both the tartarised antimonial ointment and the croton oil liniment produce external irritation, but little discharge, their influence on the disease being seldom beneficial, while they distress the patient and even augment the constitutional disturbance in some cases.

338. *Issues*, made sufficiently large, have proved most beneficial in my practice. I have always prescribed them when I have seen the patient in the first, or even in the second stage, and several persons are now alive who had recourse to them from twenty to thirty years ago, as I advised them. I have generally recommended them to be made near the margins of the ribs, when the patient is not much emaciated; or in any other situation which may be preferred. The chief objection to them is the preliminary measure of destroying the integuments for the lodgment of the peas. Where *setons* appear preferable, as respects the state of the patient, or the situation in which they may be inserted, so as least to incommode him, care should be taken, in respect of them as well as of issues, that they should be sufficiently large to be effective, and that a free purulent discharge be uniformly procured from them. When both

issues and setons are objected to, especially the formation of an issue in the usual way, then the inner bark of the mezereon, previously moistened, may be placed on a part of the surface, of the extent of a crown-piece, and confined there by means of a larger piece of adhesive plaister spread on paper or leather, the bark being renewed from time to time. This latter plan, however, is not preferable to a blistered place of this extent kept open and discharging by the usual means; but neither the one nor the other is so effective as an issue or a seton, the benefit being derived chiefly from a uniformly copious discharge. When this is procured, the internal treatment and regimen of the patient should be more restorative and generous than in other circumstances of the disease; tonics, chalybeates, animal food, restorative beverages, &c., being allowed, according to the peculiarities of the case, especially as respects the vital and vascular conditions.

339. I have since 1819 never neglected to prescribe an *embrocation* to the chest, in phthisis and in some other diseases, which acts less as an external irritant and derivative than as a source from which a salutary agent is inhaled into the lungs in so mild a form as neither to irritate nor to stimulate, whilst it is slightly absorbed. This embrocation I have employed in many internal diseases, in various forms or modifications, as a liniment, or as an embrocation or epithem—sprinkled on folds of flannel, or on spongeo-piline, and covered over by a napkin, or otherwise,—and varied as respects the constituents, the principal one being always present.*

When it is desired that external irritation should follow the first of these, the olive oil may be omitted. Either of these should be renewed every night, the vessel being previously shaken, and applied, by the means already mentioned, to a sufficiently large surface, either of the front or of the back of the chest, or of the side, where pain or uneasiness is most felt. It should be kept applied all night, or the following day, and even be renewed again in the morning, the quantity sprinkled over the surface of the flannel or spongeo-piline being sufficient to moisten, or more completely to wet these substances, according to the effect we wish it to produce, whether by inhalation of the vapour proceeding from it,

* No. 4. R—Linimenti Terebinthenæ, ℥jss.; Linimenti Camphoræ compositi, ℥j.; Olei Olivæ, ℥ss. ad 3vi.; Olei Cajuputi, 3j. ad 3jss. Misce et sit embrocatio. Vel:

No. 5. R—Linimenti Terebinthinæ, Linim. Saponis cum Opio, aa. ℥ij.; Linim. Camphoræ comp. 3jss.; Olei Cajuputi, 3jss. Misce.

or by the external derivation it may occasion, in addition to the former mode of action.

340. Blisters, mustard poultices, the cauteries, urtication, and dry-cupping have severally been resorted to as derivatives in this stage. Blisters are often of much service, especially when applied after local depletions; and when a discharge has been procured from them for some time. The others, excepting the cauteries, are seldom productive of much or permanent benefit. The tartarised antimonial ointment and liniments with croton oil have deservedly fallen into disuse. The actual and potential cauteries were not infrequently employed in former times for this disease, a discharge from either having always been promoted. They are now never resorted to in phthisis.

341. *c.* In this, as well as in more advanced stages of the disease, the *inhalation* of medicated vapours, and of certain fumes, effluvia, and odours has been recommended and been adopted. I have, however, very rarely observed much benefit derived from it, especially as commonly employed by means of an inhaling apparatus. The substances, also, generally prescribed for inhalation have been used in so concentrated a form, or are so acrid or stimulating, as often to increase the existing irritation in the bronchi, or the morbid action in the substance of the lungs, and in the seats of vomicae or of cavities. It is also very questionable whether or no the inhalation of vapours, — whether watery, emollient or anodyne, or narcotic, or possessed of all these properties, — is actually beneficial in phthisis, more especially at an early period of the malady. The inhalation of these may be useful as palliatives at an advanced stage, especially when an irritable cough, a sense of constriction in the chest, difficult expectoration, &c., are much complained of; but, in other circumstances and stages of the disease, they only tend to obstruct or impair the functions of the lungs, by interrupting the progressive metamorphosis and oxygenation of the globules of the blood, and by favouring congestion or a partial collapse of the organ, and the development and softening of the tubercles. The modes of inhalation, or of having recourse to the respiration of the effluvia of substances which are calculated to prove beneficial in this disease, will be considered in the sequel.

342. *B. Treatment of the Second Stage of the Common Form of Phthisis.*—At the commencement of this period (§ 26), or when the symptoms, especially the appearances of the expectoration, and the character of the febrile action, indicate the recent supervention of this stage on the first, then it will become a question how far the

means which have been, or still are, in use, may be continued, and in what they may be modified or changed, or what additions may be made to them. In this the physician will be guided by the peculiarities of each case; but in the circumstances of most, the same principles and means as have been discussed should be continued, modified so as to meet prominent symptoms, and commencing or fully developed complications, or intercurrent affections. The softening of the tubercles in this stage is generally attended by an increase of cough and expectoration, of the hectic symptoms, and of the morning perspirations, with occasional attacks of diarrhœa or disorder of the bowels. One or more of these usually become more prominent as the disease advances; or other phenomena are superadded, requiring the treatment to be directed more especially to them.

343. *a.* The *cough* generally suggests palliatives, in connection with the other means which the state of the patient demands. Thus hydrocyanic acid, or henbane, or hemlock, or the compound tincture of camphor, may be added to mixtures containing the liquor ammoniæ acetatis, and any demulcent which may appear most appropriate to the nervous and vascular conditions of the case; or they may be conjoined with bitter or tonic infusions or decoctions, when the states of the pulse, of the fever, and of the vital powers, require them; these latter are often rendered more beneficial by the addition of the solution of the acetate of ammonia, and of the sweet spirits of nitre. Where there is much pallor of the surface, the pulse being either weak or but little accelerated, any of the anodynes above mentioned may be added to the *mistura ferri composita*, and the effects upon the cough and upon the hectic and other symptoms carefully observed.

344. *b.* The *perspirations* during the night or early part of the morning are always productive of great exhaustion, and are the most difficult to restrain or prevent. They have been very differently treated by both ancient and modern physicians, but most frequently by mineral acids, and by various refrigerants, astringents, and tonics, as shown in the historical sketch given above (§§ 273, *et seq.*). Either of these may be prescribed in combinations suited to the case, with emollients, stomachics, or tonics, and may be made the vehicle, on the surface of which the recent *cod-liver oil* may be taken shortly after a meal, twice or thrice daily, and in sufficient quantity; this being the substance most deserving of reliance for moderating this distressing symptom. Some of the medicines advised with this object have often disordered the bowels, or in-

duced an attack of diarrhoea, and even augmented the suffering of the patient without effectively diminishing the perspirations and their consequent exhaustion; but these results rarely follow from the use of this oil. The *mistura ferri composita* is sometimes of service in allaying the severity of the hectic and the excessive perspirations, especially when there is no inflammatory complication present, and when it neither produces headache nor renders the cough harder or more severe. Dr. WATSON has found the *tinctura ferri muriatis* successful in allaying the perspirations after other means had failed. The dose he prescribes of this medicine is twenty minims thrice daily. I have likewise given this preparation, with advantage, in the infusion of calumba, with an additional quantity of the acid, or with the tincture of calumba and the dilute hydrocyanic acid; and have made either of these combinations the vehicle on the surface of which the cod-liver oil was taken.

345. *c.* When *diarrhoea* occurs it is often induced by purgative medicine, or by errors in diet, or by means employed to moderate the perspirations. The cause of it should be ascertained, and the medicines to restrain it be suggested or selected accordingly. It is, however, frequently independent of either of these causes, and the result of indigestion—of the acidity and the accumulation of *sordes* in the *prima via* consequent upon the imperfect performance of the functions of primary assimilation. In either of these circumstances antacids and absorbents, conjoined with mucilages, anodynes, or narcotics, or with mild tonics, will prove of service: as the cretaceous mixture with the compound tincture of camphor, or the tincture of hop, &c., and with the tincture of catechu, or with other vegetable astringents, if they be required. But the bowels should not be confined by these or other medicines; and when there is any risk of such an occurrence magnesia may be given with sulphur or rhubarb, or with cascarilla; or the compound decoction of aloes may be prescribed with the tincture or with other suitable medicines.

346. *d.* In this stage of the disease *emetics* and *bleeding* are seldom beneficial, unless the states of the digestive and respiratory functions require a recourse to the former, and the occurrence of pain or the appearance of an inflammatory or congestive complication demand the latter. Ipecacuanha is in most instances the best emetic, and local bleeding the most beneficial, especially when the embrocation prescribed above (p. 226) is afterwards applied and duly persisted in. Although it may be necessary to have re-

course to these means, others of a restorative or even tonic kind—both medicinal and regimenal—may be equally required; often however, in different cases, but not infrequently in the same case, and sometimes even soon after the more antiphlogistic measures have been employed. Generally, when local depletions are required, febrifuge medicines, chiefly such as the solution of the acetate of ammonia, camphor mixture, &c., are the most appropriate; but they may be afterwards conjoined with others of a more tonic nature, such as the infusion of hop or the infusion or decoction of cinchona, and to these anodynes may be added; the selection of which should depend upon the features of the case. Hydrocyanic acid, monkshood, hemlock, henbane, meadow-saffron, and digitalis, have been individually employed in combination with these or other medicines; but they require caution in their use, and careful observation of their effects. Monkshood or *aconite* is most appropriate in the more inflammatory tendencies of this and the preceding stage, but it especially demands a most cautious observation of its effects; a remark not less applicable to colchicum and digitalis, which are suited to the same states of the disease as those for which *aconite* may be given; these being useful chiefly as antiphlogistic means, either in aid of vascular depletion, or when the condition of the blood and of vital power contra-indicate a recourse to depletion; although the local morbid action requires to be restrained or even lowered.

347. *e.* The remarks offered above respecting *issues*, *setons*, and other derivatives (§§ 337, *et seq.*), apply to this as well as to the first stage. Instances are rare in which either the one or the other should not be restored to. The great difficulty often is, owing to the emaciation of the patient, in which situation they may be placed, so as to produce the least amount of discomfort. When emaciation is not very remarkable, then the margins of the ribs may be selected; but in different circumstances an issue of good size may be formed over the pectoral muscle, or between the shoulder blades. When this stage in females is characterised by suppression or marked diminution of the catamenia, the issue may be made near the groin, in the anterior aspect of the thigh. When setons are preferred, the arm, near the axilla, may be selected. If neither of these nor moxas be adopted, *blisters*, kept open as long as possible and renewed from time to time, are generally necessary. The *embrocations* advised above (§ 339), ought not to be overlooked, inasmuch as in the more urgent cases they may be applied whilst the foregoing means are also in operation, and as they are sources both of deriva-

tion and of inhalation. When the above produce a sufficient discharge, when GRIFFITH'S myrrh mixture, or other chalybeates or tonics, may be prescribed with anodynes, narcotics, &c.; and their effects upon the cough, the pulse, and the hectic should be carefully observed. If these symptoms become aggravated by them, they ought to be relinquished, and the salines, especially the solution of acetate of ammonia, or of citrate of potash, with hydrocyanic acid, conium, &c., as noticed above (§ 335), may be substituted. If these effects do not result, then the more generous regimen recommended for the first stage (§§ 324, *et seq.*) is equally, if not even more, required for this.

348. *f. Inhalation* of very dilute medicated vapours and fumes may be tried in this stage, as well as in the first. The opinion I have formed of them, and stated with reference to that period (§ 341), is not materially different as regards this. Cases may occur in which they will be more serviceable in the second than in the first stage, and still more so in the third than in either of the foregoing: but the amount of benefit, or the want of it, will entirely depend upon the substances selected for this mode of administration, and upon the way of effecting this intention. But mild or weak *fumigations* of the patient's apartment are generally much more beneficial than inhalations, which often irritate and increase the local lesions (§ 341).

349. *g.* In females the state of the *catamenia*, as respects both the intervals and the duration and quantity of the discharge, is of the greatest importance, especially in the first and second stages of the malady. Excessive discharge, whether as to frequency of recurrence, the duration of its continuance, or the quantity, not infrequently predisposes to, or more directly occasions, phthisis; and the same disorders of this function, if allowed to proceed, will also aggravate or hasten the progress of this malady, if they occur in either the first or second stages. The rapid or sudden disappearance of this discharge, on the other hand, is even more certainly and rapidly injurious, in whatever stage this may take place. A difficult or scanty catamenial discharge requires attention, although it is not so dangerous as either of the former states, especially the latter. Excessive states of the catamenia should be moderated with caution, and by such means as are not likely to be followed by suppression. The decoction or infusion of cinchona with either of the mineral acids, or the sulphate of quinine in the compound infusion of roses, and tincture of orange-peel may be prescribed, or the sulphate of quinine may be mixed in some water and taken

without any addition. If anæmia have been produced by this discharge, the tincture of the sesquichloride of iron may be given, either alone, or with the preparations of calumba or quassia (§ 335). It should not be overlooked, that the disorders of the catamenia in the early stages of phthisis are often occasioned by masturbation; and when this is suspected, and when advice can prudently be given and precautions taken against this vice, it becomes the duty of the physician to act accordingly. In these, as well as in other circumstances of profuse catamenia, ipecacuanha, conjoined with extracts of gentian, catechu, and a narcotic, may be given in such quantity as to occasion some degree of nausea to even retchings.

Scanty or difficult menstruation requires means appropriate to the peculiarities of the case; for either of these states may be attended, in one patient, with an anæmied or chlorotic appearance, and, in another, with little or no apparent deficiency or poorness of blood. In the former case, the compound mixture of iron, with as much of the compound decoction or the tincture of aloes as will act moderately on the bowels, or prevent constipation, with a little of the extract or tincture of conium, will generally be of service. In other cases, where there is no deficiency of blood, a few leeches may be applied below the groins shortly before the expected period of the catamenia; and the hip-bath and pediluvia, at a sufficiently warm temperature and with the addition of salt or mustard, resorted to.

In cases attended by suppression of this discharge, strenuous efforts should be made to restore them. The hip-bath, pediluvia, &c., rendered stimulating by bay salt and mustard, leeches applied around the anus, or beneath the groins, the preparations mentioned above (§ 334), walking exercise, or riding on horseback or in a carriage, and the several emmenagogues usually advised for suppression of the catamenia, should be prescribed in combinations or forms suited to the state and stage of the pulmonary disease.

350. *h.* In this stage various complications appear, either as temporary or intercurrent affections, or as morbid associations, which continue to the termination of the malady. These will be noticed in the sequel; but there is one which is rarely absent, and which renders the treatment difficult, namely, the bronchitic affection. This in many cases becomes the prominent disorder, and requires the treatment to be more especially directed to it; the most generally serviceable means being, according to the accompanying fever and the state of the patient, the solution of the acetate of ammonia with the spirit of nitrous ether, dilute hydrocyanic acid and camphor

mixture; or in somewhat different states, with carbonate of ammonia, compound tincture of camphor, or henbane or conium. If there be a hæmorrhagic tendency, the acetic acid may be added; and in most cases the terebinthinate embrocation should be applied to the chest.

351. *i.* The *diet* and *regimen* in this stage may, in a very large proportion, if not in the majority of cases, be altogether the same as I have advised for the prevention and for the treatment of the first stage of the disease (§§ 324, *et seq.*) In many cases a fish diet — shell-fish, the white kinds of fish, always boiled, but never fried, will agree well in this stage; a squeeze of lemon, little butter, or preferably the liver of the fish, being the chief or only sauce. The fish and their livers, which are most beneficially used as articles of diet, are the *Gadus brosmius*, or torsk; the *Gad. morrhua*, or cod; the *Gad. molua*, or ling; the *Gad. aeglefinus*, or haddock; the *Gad. merlangus*; the *Gad. callarius*; the *Gad. carbonarius*, or coal-fish; and *skate, turbot, plaice, flounder, whittings, soles, &c.* The recent livers of all these species of the genus *Gadus*, boiled in such a manner as to preserve their oil, may be used either as sauce to the fish, or may be eaten with it, or the oil may be taken after the meal, in the usual medicinal way. They are beneficial both as articles of diet and as medicine. When quite recent they have no fishy or unpleasant flavour, and are easily digested,—the more easily the more oil they contain. As to other articles of *diet, regimen, change of air, exercise, travelling, voyaging, and choice of residence*, the remarks which I have made above (§§ 324—330), and in the sequel, are applicable to this stage, according as the strength of the patient and the prominent symptoms will admit of their adoption; and as the presence or absence of any of the more important complications will suggest.

352. *C. Treatment of the Third Stage of the common Form of Phthisis.*—The treatment of this stage (§§ 33, *et seq.*) is frequently but little different from that already advised. The state of the patient may not, in some instances, be materially different from that characterising the second stage, although cavities—one or more—have already formed in one or even both lungs. The patient may not be materially worse in respect either of strength or degree of emaciation, or of cough and respiration, especially if the more aggravated symptoms and complications have not as yet been experienced. More commonly, however, he is much worse as regards all these; and colliquative perspirations, attacks of diarrhœa, severe paroxysms of cough and of oppressed breathing, and pains in various parts of

the chest or its vicinity from inflammatory congestion of portions of the lungs or from the extension of the morbid action to the pleura, are more or less experienced, and are generally relieved with greater difficulty than in the preceding stages. The treatment depends chiefly upon the complication, or rather complications, which characterise this stage.

353. *a.* In all cases there is more or less *bronchitis*, chiefly, however, of the bronchi communicating with the softened tubercles and cavities; but there may be in addition *inflammatory* or *sub-inflammatory action* in the surrounding portions of lungs, or even also in parts of the pleura in the vicinity. These may require, or at least suggest, a treatment which neither the strength nor vascular condition of the patient may well bear, especially when carried so far as to subdue the superinduced local mischief. But to leave these complications to their natural courses, when clearly manifested by symptoms, may be more injurious than the effects of judicious means prescribed for their removal; and, as far as my experience enables me to decide, the employments of such means is the safest alternative. For these states of this stage, therefore, local depletions, by leeches or by cupping, are required according to the condition of the patient and symptoms of the case, the quantity of blood taken at first being small. When the indications for having recourse to this measure are doubtful, dry-cupping, afterwards blisters, the terebinthinate embrocations already advised (§ 339), and the febrifuge medicines recommended above, are most appropriate. Of this class of medicines, the solution of acetate of ammonia, in forms and combinations already noticed (§ 343), is the most generally of service.

354. *b.* In this stage, especially in its advanced course, the colliquative perspirations and diarrhoea exhaust the patient and more or less waste the red globules of the blood. Whilst these symptoms should be restrained, the powers of life and the supply of duly assimilated blood-globules must be supported and promoted. The means which fulfil the one indication often also aid the other. This is more particularly demonstrated by the effects of cod-liver oil, and by medicines which improve the digestive and assimilating processes, and correct, counteract, or remove the contaminating matters which are carried into the circulation from the lesions seated in the lungs, whether softened tubercles or ulcerating cavities, and which thereby affect the cutaneous and mucous surfaces and follicles, so as to give rise to these exhausting and distressing symptoms of the malady. Numerous means, besides those already

mentioned, have been proposed for these morbid conditions, especially the acetate of lead with pyroligneous acid and laudanum, the sulphate of zinc with sulphuric acid, the sulphate of copper with opium, the substances containing tannin, gallic acid, &c., and catechu, kino, krameria, hæmatolylum, nux vomica, &c.; but very few of these, even while they restrain the diarrhœa, diminish the perspirations, or in any other respect alleviate the malady. Indeed, in some cases they aggravate the disease, and only accelerate its progress to a fatal issue by preventing the elimination by those emunctories of the effete, morbid, and contaminating materials conveyed into and circulating in the blood.

355. *c.* Much more rational and efficient *indications* for the abatement of the colliquative diarrhœa and perspirations in phthisis would be the improvement of the digestive and assimilating functions by such means, or combinations of means, as would at the same time, by their partial absorption into the circulation, correct, change, or counteract the contaminating matters which are imbibed from the seat of the disease; whether these matters be purulent or tubercular, or the sanious fluid formed in or on the surface of ulcerating parts, and whether they are actually present in the blood or are more or less changed in the course of the circulation of the blood. That they actually contaminate more or less this fluid, however small may be the quantity which passes into it, and thereby give rise to the most distressing and dangerous symptoms of phthisis, cannot be doubted, the skin and the bowels being two of the chief channels through which they, and other injurious matters they may form, are eliminated from the circulation; but the selection of the means of fulfilling these indications is much more difficult than devising them, and depends entirely upon the peculiarities of individual cases, as respects especially the progress of the disease and the states of respiration and circulation. The bicarbonate and the nitrate of potass, prescribed in tonic infusions or decoctions, with aromatic or astringent or narcotic tinctures, according to the state of the case; magnesia and sulphur, with the powder of cascarilla or of cinnamon or ginger and liquorice powder, or with other substances, as the state of the bowels will suggest; the compound iron mixture, or the aromatic mixture of iron (D. P.); the bitter or tonic infusions, with carbonate or citrate of potass or of soda and anodynes; balsams, the purified or inspissated ox-gall, with conium or with the compound soap pill and ipecacuanha, or with the purified extract of aloes, according to circumstances; and camphor, the terebinthines, tar or tar water, or

Dantzic spruce, conjoined with such of the foregoing medicines as the features of the case require, may severally be employed. In some instances where the colliquative state of the bowels and other symptoms indicated a contaminated state of the blood, and consecutive alteration of the mucous surface and follicles of the bowels, I have prescribed the annexed pills* at night, or night and morning, or with the meals; the bitter vegetable tonics, with alkalies, &c., having been taken in the intervals between meals.

It may be noticed that both the mixtures and pills may be modified, or receive additions, so as to meet the peculiarities of the case. If irritation or pain in the bowels be experienced, small doses of the extract of opium, or the soap pill with opium, may be added to either of the foregoing; and if diarrhœa, or tenesmus, or dysenteric symptoms be present, ipecacuanha in full doses may also be conjoined with these.

356. With the other distressing symptoms, to which I have directed notice, there are others for which relief is required, and although we may be unable to impart it, we should at least attempt it. The dyspnœa, difficulty of breathing, the feelings of suffocation, &c., in this stage, are sometimes distressing. In many instances the terebinthinate embrocations already mentioned (§ 339), applied over the chest or between the shoulders, will afford some relief; and an opiate conjoined with either of the pills just prescribed, or with expectorants and antispasmodics, or the compound galbanum pill, or with stimulants and other means indicated by the state of the case, as already mentioned, will often be of service. When the dyspnœa is urgent or distressing, an emetic will be found to afford most relief. The aphthæ which, towards the close of this stage, often appear in the mouth, tongue and throat, further increase the distress of the patient, and require suitable treatment. The means which I have generally used in these cases have been gargles for grown up persons, or pieces of sponge fastened on whalebone moistened in the medicines prescribed for children. These medicines have been varied, or very different, according to circumstances,

No. 6. *R.*—*Pilulæ Ferri comp.*; *Pilulæ Rhei comp.*; *Extracti Fellis bovini*; *Picis liquidæ*, *āā. 3ss.* *Misce et contunde bene, dein divide massam in pilulas xxx.*; *quarum capiat unam ad tres pro dose.* *Vel:*

No. 7. *R.*—*Extr. Fellis Bovini*; *Sulphuris præcipit.*; *Picis liquidæ*; *Confect. aromat. in pulv.*, *āā. 3ss.*; *Olei anisi, q. s.* *Contunde bene et divide in pilulas xxxvj.* *Sumat j. ad iij. pro dose.* *Vel:*

No. 8. *R.*—*Magnesie carbon.*; *Sulphuris præcipit.*, *āā. ʒij.*; *Confect. aromat. in pulv. 3ss.*; *Creasoti m viij. ad xij.*; *Olei anisi, et muscilag. q. s.* *Misce et fiant secundum artem pilulæ xxxvj.* *Capiat j. ad iij. bis terve in die.*

but most frequently borax with honey and tincture of myrrh; the hydrochlorate of ammonia, with or without an addition of the acid, in simple solution, or in tonic or astringent infusions; or the solution of the permanganate of potash (3ss. ad 3j. in aquæ 3viij.); the nitrate of potash, with or without the addition of a little of the acid, and similarly dissolved, and various astringent salts dissolved, simply or in tonic or astringent infusions or tinctures, have been prescribed.

357. *d. Delirium* rarely occurs in this form of phthisis until shortly before dissolution, unless in females, when this stage of the malady is accelerated by, or occurs in the puerperal state, or in cases where the nature of the medicines or the idiosyncrasy of the patient has given rise to this symptom. Most of the narcotics and anodynes, especially henbane, conium, aconite, opium, morphia, digitalis, &c., will have the effect of inducing delirium in the advanced progress of this stage, especially in nervous and exhausted states of the patient, and when either of these substances are given in too large doses, or continued too long; or when substances which are calculated to prevent or to correct their injurious effects have not been conjoined with them. The delirium, in most instances, is slight; but it is sometimes more severe or acute, and is attended with restlessness and sleeplessness, or it approaches the character of delirium tremens. For these modifications of mental disorder, lowering means only hasten a fatal issue. If they have been occasioned by either of the medicines just mentioned, they will frequently disappear after the cause has been removed, especially if judicious means be prescribed; but, under every circumstance, the state of vascular action, especially as respects the brain and membranes, should be observed. If it be increased in these, cold-sponging the head, mustard pediluvia, &c., are required: and even when such increase is present, it will be more readily relieved by restoratives, prescribed in small and moderate doses, and their effects watched, than by opposite means. The medicine from which most relief may be expected in the delirium occurring in this period, are camphor, ammonia, the solution of the acetate of ammonia, the carbonate of ammonia, the compound spirit of ether, the spirit of nitric ether, the hydrochloric ether, the preparations of serpentaria, of arnica, and of sumbul. These may be prescribed individually, or in combinations of two or more, or with the alkaline, saline, and restorative medicines I have mentioned as being useful when the blood is contaminated, the delirium often arising from that condition, as well as from exhausted organic, nervous, or vital influence.

CHAP. XVI.

TREATMENT OF THE SEVERAL FORMS OF TUBERCULAR CONSUMPTION.

i. TREATMENT OF THE LATENT FORM OF PHTHISIS.

358. THIS variety of the disease (§§ 91, *et seq.*) generally eludes the notice of the friends and the fears of the patient until it has advanced to a state hardly admitting of hope. If however the symptoms characterising it should alarm either friends or patient, if depression of spirits, impaired digestion and assimilation, or other indication of disorder lead to the procuring of medical advice and the detection of the malady in its silent and stealthy course, although no prominent or unmistakeable sign be present, the treatment which will be found most beneficial is that which has been already advised for the *Prevention* and for the *threatened appearance* of the malady (§§ 268, 320). It is obvious, however, that the best devised means will have no beneficial effect if the causes which injured the constitution still continue to act. The physician should endeavour to ascertain what these are; and if they be such as may be removed, the necessity of making the attempt should be insisted upon, and the patient be made acquainted with the consequences of the neglect of this advice, especially when the removal of these causes depends upon himself. In most of the cases of this variety the causes are usually depressing and exhausting; and in many, as soon as the nature of the malady is suspected, the digestive and assimilating functions require restoratives, mild tonics, change of air, moderate exercise in the open air, travelling, and pleasurable occupation of the mind; the regimenal and medical treatment I have advised above (§§ 324, *et seq.*) for the first stage of the usual form of the disease being also necessary. In this latent or silent course of phthisis vascular depletions are not well sustained; and if they be at all attempted they should be small, and their effects watched. In the great majority of cases of this form, and especially when depressing or exhausting causes have occasioned the malady, medicines of a decidedly restorative or tonic kind, attention to the digestive

functions, cod-liver oil, and the other means recommended at the place referred to, should be adopted. These may arrest the disease; but if it should advance, nevertheless, and become unmistakingly developed, the treatment must necessarily be the same as I have advised for the more common form of the malady, modified as above, according to the manifestations of the advanced stages.

ii. TREATMENT OF PRIMARY ACUTE, OR RAPID PHTHISIS.

359. *A.* The symptoms of the *first variety* of this form (§§ 95—101) have been described by me as intermediate between those of congestive bronchitis on the one hand, and of congestive or nervous pneumonia on the other (§ 97), both lungs being more or less affected. It is of frequent occurrence in children, and it will be noticed more fully in the sequel, with reference to this class of cases. The cases which I have observed have been consecutive of measles in a scrofulous diathesis, or of delayed, suppressed, or excessive catamenia. In these bleeding was not indicated or was injurious. Emetics, the solution of the acetate of ammonia, with ether or ammonia, small doses of camphor, the terebinthinate embrocation applied over the chest or between the shoulders, and blisters, were the means which appeared to be of most service. Cod-liver oil was either not retained, or was nauseated and not taken, or failed of producing any benefit. The infusion or decoction of cinchona, with nitrate of potash and bicarbonates of the alkalies, or with the solution of acetate of ammonia and various ethereal preparations, and small doses of camphor with aconite, &c., were also prescribed in different cases, or in the same cases at different periods of the disease, but with no marked advantage. I have more recently prescribed with greater benefit the tincture of the muriate of iron, with hydrocyanic acid, and sometimes with a slight addition of the muriatic acid, or with the tincture of calumba or quassia. These taken with water may be made the vehicle for the exhibition of cod-liver oil; and when these were taken without much difficulty or were retained much benefit was derived from them.

360. *B.* The *second variety*, or more strictly febrile form of acute phthisis described above (§§ 100, 101), is often mistaken for low nervous or typhoid fever, which it closely resembles, especially in its advanced progress. In the cases which have fallen under my observation I prescribed the remedies I have just mentioned (§ 359); and of these, the last-mentioned, or those consisting of the preparations of cinchona with the substances stated to have been conjoined

with them, the chlorate of potass, camphor, the terebinthinate embrocations, and the muriated tincture of iron, with its adjuncts, &c., were of service in prolonging the life of the patient. The nature of these cases almost precludes any hope of further advantage than this from any treatment whatever.

iii. TREATMENT OF CONSECUTIVELY ACUTE PHTHISIS.

361. This (§ 102) is merely the supervention of either of the acute varieties of the disease described above (§§ 95—101) upon the latent form (§§ 391), or the development of this latter form owing to an attack of hæmoptysis in its course, or to some determining or aggravating cause or occurrence. Although an attack of hæmoptysis often relieves the pulmonary symptoms when they have been unequivocally manifested previously, at least for a time; yet it is sometimes followed by an acute state of the disease, most frequently by the more common form, when it occurs in the course of the latent variety. In the consecutive manifestation of acute symptoms the treatment should depend upon the character of these symptoms and upon the associations they present. If hæmoptysis take place, the treatment I have advised for it (§§ 65, *et seq.*) may be adopted as far as it may be appropriate to the peculiarities of the case. If the local symptoms and signs indicate congestion or inflammatory action in one or both lungs, local vascular depletions, or even a repetition of them, emetic, antiphlogistic, and saline medicines, especially the solution of the acetate of ammonia, sinapisms, terebinthinate embrocations, blisters, and other means already noticed, will be of service; and if the disease assume the acute or febrile states, the medicines noticed above (§§ 359, 360) may be prescribed, although with little or no hope of benefit from them. In some instances the malady assumes a less acute or febrile form, the treatment having temporarily mitigated the severity of the symptoms. This is probably owing to the congestive and inflammatory states of the bronchi and substance of the lungs which had supervened upon an extensive but latent formation of tubercles in both lungs having been partially subdued by the means employed. In these cases the development of the tubercles by the morbid action in the bronchi and substance of the lungs afterwards prevents this action in these parts to subside: and thus both these morbid conditions act and react on each other, so as to occasion an acute state of disease. The extension of these lesions in a more or less marked degree through both lungs

generally terminate fatally before large cavities, or even any cavities are formed; whereas, in the common form of the disease, the greatest part of the lungs remains free from change, although other portions are ulcerated, excavated, or otherwise disorganised. In these circumstances the principles of treatment already developed should be adapted to the peculiarities of individual cases.

IV. TREATMENT OF PROTRACTED PHTHISIS.

362. This form (§§ 104, *et seq.*), especially when early recognised or manifested and judiciously treated, furnishes many chances either of recovery or of prolonged existence. For this variety, particularly when the pulse and respiration are not much disturbed, the several hygienic means advised for the *prevention* of the disease and for the treatment of the first stage (§§ 323, *et seq.*) are generally of great service, more especially change of climate, voyaging, exercise and agreeable occupations in the open air, and in a dry and temperate situation; a residence in Harrogate from May or June until October or November, and a judicious recourse to the mineral waters of that place; attention to the digestive and assimilating functions, aided by digestible and nutritious food; by sulphur, balsams, a farinaceous and milk diet, &c.; by tonics, stomachics, and chalybeates, when the disease appears to have proceeded from depressing or exhausting causes; and by emetics and other antiphlogistic means, or by small bleedings, issues, setons, terebinthinate embrocations, blisters, &c., according as vascular excitement or congestive or inflammatory complications may occur. In the simpler states of this form, when the pulse is weak or slow, and no congestive or inflammatory complication is present, and especially if the blood be deficient or thin, the *mistura ferri composita*, or the *tinctura ferri muriatis*, with the dilute hydrocyanic acid, will be given with benefit; and with either of these other medicines may be conjoined, especially cod-liver oil, anodynes, &c.

V. TREATMENT OF PHTHISIS IN INFANTS AND CHILDREN.

363. This class of patients (§§ 106—111) requires more particularly the hygienic measures I have recommended in the sections above on the *prevention* and *early treatment* of phthisis (§§ 268—320). Asses' milk, a milk and farinaceous diet, change of climate, strict attention to the promotion of the digestive and assimilating functions by means of diet, regimen, and suitable medicine, are among the chief means in which confidence can be placed, although

others should be added which the circumstances of particular cases will suggest. As phthisis in children frequently commences in the form of catarrhal fever, or in that of whooping-cough, especially in the broncho-glandular variety of phthisis (§ 111), the treatment should be calculated to allay irritation without impairing vital force. If the child be not too young for anodynes, a judicious selection of these may be made, and be conjoined with the mineral acids or with chalybeates, tonics, &c. Dilute hydrocyanic acid, or conium, may be thus associated. Ipecacuanha may, in the more febrile cases, be given with conium, or with small doses of lactucarium or of white poppy, and the terebinthinate embrocation may be applied between the shoulders or on the chest. In different or other circumstances, the nitro-muriatic acids* may be taken with the dilute hydrocyanic acid, and with various tonic infusions, and these, given in water, may be made the vehicle for the cod-liver oil, which may also be given when this is not preferred upon dilute ginger or orange wine. When weather or season permits, the child should be as much as may be prudent in the open air, in the light of day, and be allowed such amount of exercise as he may be inclined to indulge in. In many cases I have seen great benefit derived from the tincture of the muriate of iron, and the dilute hydrocyanic acid taken in water, either alone, or made the vehicle of cod-liver oil, and I have often prescribed with advantage the iodide of iron with syrup of sarza, used in similar forms. When the disease advances to the second or third stage in children, then the treatment advised above for these stages, in the usual form of the disease, will, with due reference to the ages and states of the patients, be equally appropriate for them.

vi. TREATMENT OF PHTHISIS IN THE DARK RACES (§ 113, and *note*).

364. The forms and states of the disease may reasonably be considered as varying with race and climate (§ 114), and also with the habitual food and clothing, or amount of clothing, of these races. From what I have seen or gathered from writers respecting the disease in these races, I conclude that for them a tonic and restorative treatment, with attention to the digestive organs and to the functions of the skin, is especially and generally required. In other respects the means of cure advised above for the several forms

* No. 9. R.—Acidi Nitrici diluti, ℥xxiv.; Acidi Hydrochlorici diluti ℥xxxvj.; Acidi Hydrocyanici diluti (Ph. Lon.), ℥xij.; Tinct. Aurantii, ʒij.; Syrupi Tolutani, ʒij.; Aquæ Flor. Aurantii, ʒij.; Aquæ Destillatæ ad ʒvj. ℥. Capiat, ʒss. sextis horis. (For a child from three to five or six years of age.)

of the disease in the white races are also suited to these forms when they appear in the dark races. In these latter the causes are commonly depressing and exhausting. Confinement to close situations, where the air is rendered impure by frequent respiration or by numbers, removal to colder and more humid climates than those from which they had been taken, venereal excesses, and insufficient food are the most frequent causes of phthisis in these races, and hæmoptysis is a common occurrence at the accession or early stage of the disease. For these the more astringent tonics, the preparations of cinchona or of cascarilla, conjoined with laxatives or aperients, or with diaphoretics, according to the states of the bowels and skin; ipecacuanha combined with the balsams and restoratives, chalybeates with stomachics, and terebinthinate embrocations externally, are most frequently indicated. If febrile action be present, the warm and restorative febrifuges and diaphoretics are required; especially the solution of acetate of ammonia, the carbonate of ammonia, camphor, and the infusion or decoction of cinchona. If the bowels become disordered, ipecacuanha in large doses, with opiates, the bitter extracts, and such of the medicines already mentioned as the circumstances of the case will suggest, will be found most appropriate. Dr. ARCHIBALD SMITH states that the several dark races, and the crosses between these races, on the coast of Peru especially, when attacked by the hæmoptysic form of phthisis, were most benefited by a residence for several months in the mountains at an elevation of 5000 to 10,000 feet above the level of the sea.

CHAP. XVII.

TREATMENT OF COMPLICATED PHTHISIS.

THE *complications* which severally appear from the accession to the close of this disease require a few remarks. These complications are not confined to any one form or stage of the malady, but occur in all; although more frequently perhaps in some cases than in others, owing to constitution and determining causes, and to the exposures and other influences in operation during the progress of the malady. Some of these complications may appear in the character rather of prominent or more urgent symptoms than of actual superinduced or intercurrent affections; but, as phthisis

may, and actually often does, run its whole course without the appearance of any of them, or of one only in some cases and of another in others, whilst two or more may occur even in the same case, although not at the same time, they may be more correctly considered as contingent symptomatic affections, complicating, and often rendering the tubercular or original malady more severe and more rapidly fatal. With a few exceptions, these affections have already been considered with reference to treatment when discussing the successive stages.

i. TREATMENT OF HÆMORRHAGIC PHTHISIS OR OF PULMONARY CONSUMPTION WITH INTERCURRENT HÆMOPTYSIS.

Hæmoptysis is a frequent occurrence in phthisis, and is of such importance as to warrant an historical as well as a practical view of its treatment (*see* §§ 41, *et seq.*).

365. A. ARETÆUS and PAULUS ÆGINETA recommend that the patient be laid upon a couch in a cool place, with the head elevated, and all physical and mental excitement, and talking, or strong respiration, should always be carefully avoided. As to the treatment, CELSUS, GALEN, AËTIUS, and ALEXANDER, are tolerably agreed. ARETÆUS, ORIBASIUS, ACTUARIUS, and NONNUS, advise blood-letting in most cases, ligatures on the extremities, and astringents internally and externally. A similar practice is advocated by CELSUS, with the addition of cold drinks. SCRIBONIUS LARGUS and OCTAVIUS HORATIANUS direct the chest to be sponged with vinegar. GALEN remarks that cooling astringents often have a different effect from that which they are intended to produce; that they occasion determination of blood internally, and congestion of the deep-seated veins; and that he has seen persons with hæmoptysis injured by the application of cold to the chest. He, therefore, does not approve of the indiscriminate recourse to astringents and to cold. CÆLIUS AURELIANUS recommends the application of cold water and vinegar or other refrigerants to the thorax, and bleeding, general or local, or both, if pain, dyspnœa, or a dry cough be present. He gives, internally, gum with alum, and decoction of poppies, vinegar, and electuaries with opium, frankincense, &c. He decides in favour of the disputed practice of applying ligatures to the extremities. Similar remedies are advised by PAULUS, with the addition of austere wine and fruits. Amongst the latter, the promegranate is particularly mentioned. MARCELLUS directs nearly the same means, with the exception of ligatures. DIOSCORIDES, PLINY, GALEN, ALEXANDER, PAULUS, and

most of the ancients prescribe the hæmatite, or blood-stone, which contains oxide of iron.

366. The Arabian writers supply very little information respecting the treatment of hæmoptysis, beyond what is contained in the works of the Greeks. AVICENNA, who is very full upon the subject, approves of the internal exhibition of vinegar, and of anodynes, as mandragora, henbane, and poppy, for the relief of cough. AVERHOES condemns the use of vinegar; but RHASES and SERAPION advise the chest to be sponged with it. MESUE prescribes chalybeate waters for drink, and astringents. HALY-ABBAS endeavours to adapt the treatment to the forms of the disease. In the hot (the active) variety, he directs bleeding from a vein, and the repetition of it, if required, purging with mild medicines, and the combination of demulcents with poppy. When the disease arises from a cold cause (passive), he prohibits venesection and prescribes stimulants—as frankincense and myrrh, and, in some cases, tonic astringents—as galls, sumach, alum, &c., with refrigerants applied to the chest. ALSAHARAVIUS approves of bleeding, cold applications to the thorax, opiates and astringents, with a milk diet. RHASES agrees with this practice, but guards against the indiscriminate application of cold to the breast. I have been called to two or three cases, for which cold epithems had been most assiduously employed; but they were injurious, and evidently increased the pulmonary congestion and all the pectoral symptoms. VAN SWIETEN is favourable to the internal and external use of cold water in this disease; but I am confident that sponging with vinegar will be found more serviceable and more generally appropriate than a prolonged application of cold.

367. *B.* From the brief view now exhibited, it will be seen that but little progress has been made in modern times in the treatment of hæmoptysis; and that this progress has reference chiefly to the more appropriate use of the means, which were known to the ancients as well as to the moderns. Much, however, will depend upon the decision with which they were prescribed and carried into effect.—*a.* Upon seeing a patient attacked by hæmoptysis, the physician will frequently find him alarmed; and the consequences of such alarm may be mistaken for the state of the constitution, or the effects produced by the disease. This and various other circumstances must be taken into consideration, and a determination as to the measures to be adopted, promptly formed. The older writers observing the relief often following a free discharge of blood at an early stage of the disease advised that the hæmorrhage should be allowed to proceed for some time. But as to this no general rule

can be observed; for to do so would often greatly alarm the patient, and be running the risk of blood passing into and obstructing or irritating many of the bronchial ramifications which had remained free from disorder. It is therefore safer to arrest the hæmorrhage and remove local congestion by small, or at most, by moderate general or local bleeding; or by the internal exhibition of the spirits of turpentine in doses of twenty or thirty drops every half hour or hour * and by the turpentine embrocation or epithem applied over the chest. The quantity of blood to be taken at the time, or subsequently if reaction take place, should depend upon the habit of body and constitution of the patient, by indications of active congestion, or vascular determination, upon the state of the pulse, and the effects produced. If venesection be injudicious, cupping or dry-cupping may be substituted, or be practised instead of venesection, when a repetition of this latter appears to be indicated.

Large doses of ipecacuanha, or one or two grains given every quarter or half hour, are also of great service. In cases of hæmoptysis with inflammatory symptoms, and in order to prevent too great a loss of blood, a quarter or even an eighth of a grain of tartarised antimony with five or ten grains of nitre may be given every hour, or every second or third hour; but these should not be continued after the pulse has indicated their effects. The chief benefit from ipecacuanha or from antimony arises from the nausea they produce. Much also of the advantage derived from sea voyages in this complication of phthisis is to be ascribed to the nausea thereby occasioned. If the bowels be confined, half an ounce each of spirits of turpentine and of castor oil may be taken in a suitable vehicle, and the same substances may be administered in much larger doses in gruel as an enema.

368. Where the antecedent disease, the quantity of blood discharged or removed by venesection, and the manifest asthenia from these or other causes, forbid further depletion, recourse must be had to *derivatives*, *astringents*, and *sedatives*, generally simultaneously or in combination. Indeed, even in those cases which evince increased action, and require decided or repeated depletion, these as well as refrigerants, ought to be brought as early as possible into

* No. 10. R.—Olei Terebinthinæ, ʒij. ad ʒiij.; tere cum Mucilag. Acaciæ, ʒj., et adde Pulv. Tragacanth. comp. ʒij.; Pulv. Glycyrrh. ʒss.; Syrupi Rosæ, et Syrupi Tolutani, āā. ʒj. ad ʒjss.; Aquæ Rosæ, ʒij. et Aquæ Destill.; ad ʒviij. Misce. Capiat Coch. j. vel ij. larga, 2dis. vel 3tiis. horis, vel sæpissime, prius agitata phialâ.—In cases of sinking, asthenia, &c., cajuput oil, spirits of lavender, or tinctures, or other stimulants may be added, and infusion or decoction of cinchona may be substituted for the water.

simultaneous or successive action. The feet and hands ought to be plunged in warm water, and if venesection be not performed in the former situation, mustard or salt, or both should be added to the water. The internal use of astringents is generally adopted; but those usually employed can have little effect, excepting in slight or protracted cases; and even powerful astringents taken into the stomach will have little or no influence upon the bleeding part before a number of hours have elapsed. From observing the rapidity with which oil of turpentine is absorbed, and passes off by the kidneys and lungs, I have been induced to employ this medicine in preference to others as an astringent in hæmoptysis; and have prescribed it in small or large doses according to circumstances, or as it was desirable to act at the same time more or less decidedly upon either the bowels or kidneys, and immediately upon first visiting the patient.

369. In advising sponging with vinegar and rose-water, or sprinkling cold water on the breast, I had especial reference to the sympathetic influence these may have upon the bleeding surface, and the reaction in the skin which they subsequently occasion, especially when they are also applied to the face. When these means have not succeeded, I have, on several occasions, prescribed rubefacients, instead of cold applications, to the chest; as these last are more frequently injurious than beneficial in such cases. An epithem with oil of turpentine, either tepid or warm, allowed to remain on the breast, or between the shoulders, until it occasions a burning sensation and redness, is the rubefacient I have preferred, as the quickest in its operation, and the most conducive to the removal of congestion or of inflammatory action. The vapour also of the turpentine is diffused around the patient, and being inhaled during inspiration, assists in constringing the vessels of the bleeding surface. Where there appears any objection to this application, a *sinapism*, or a piece of flannel soaked with either of the *liniments* prescribed above (see p. 226), may be placed upon the chest. *Blisters* may be resorted to if these fail. I agree with LENTIN, RANOE, and PERCIVAL, in the propriety of applying them to the back or between the shoulders.

370. *b.* Besides the above means, others may be employed; the practitioner being guided in his selection by the stage and state, by the other peculiarities of the case, and especially by the previous treatment, by the state of vital power and vascular action, and by the presence of cough and febrile symptoms. It should be kept in mind, that the sooner the hæmorrhage is arrested, the least likely is infiltration of the bronchi and its consequent evils to take place;

and that, whilst this—the *first indication of treatment*—is receiving attention, the accumulation of the effused blood, and the consecutive effects upon the bronchi and lungs, and through them upon the system, ought to be prevented as far as possible. Most of the information that will be here conveyed may be viewed chiefly as suggestions, which the practitioner will receive or reject, as he may deem proper, or which he may apply to practice as the features of the disease may warrant. He ought, however, to be impressed by the fact that, however high vascular excitement may appear, vital force and tone are more or less impaired; that in proportion as tone becomes diminished, so will the tendency to infiltration of the bronchi or lungs with the effused blood, and to capillary congestion of them, be increased; and, consequently, that vascular depletions and other vital depriments although often required with promptitude and decision should be employed with discrimination and caution.

371. Of the various *astringents* recommended in hæmoptysis, the *acetate of lead*, conjoined with opiates or other sedatives, as advised by REYNOLDS, LATHAM, DAVIES, VALENTIN, AMELING, and others, has been most lauded, though much less efficacious than turpentine. It may, however, be given with acetic acid, this acid being itself one of the best remedies when taken in sufficiently large quantity. Of this the ancients were fully aware, as it was employed most liberally by them. The *mineral acids* were preferred by HENNING, DOEMLING, HALLER, JOERDENS, LOEFFLER, SCHULZE, and others; and by most of the moderns. I have, however, seen the liberal use of common vinegar more efficacious than these; and it is more generally congruous with the other remedies usually employed. Indeed, where the acetate of lead is given, the mineral acids will either neutralise its effects or prove injurious. The *gallic acid*, dissolved in water, or in æther, or in alcohol, and the powder or tincture of galls, may be mentioned. RUSPINI's styptic is supposed to be a solution of this acid in æther or in spirit; and may also be tried on account of its reputed efficacy.* Of other astringents little additional mention need be made. They are sometimes useful in the more adynamic states of the disease, or after large losses of blood, or after copious depletions. When debility is urgent, those which are most tonic may be selected, as the tincture of the sesquichloride of iron; the sulphates of iron or of alumina, or of zinc, or of quinine

* Dr. A. T. THOMSON states that this styptic consists of gallic acid, a small proportion of the sulphate of zinc, and of opium, dissolved in a mixture of alcohol and rose-water. This combination is judicious in most hæmorrhages.

—the two latter in the infusion of roses with sulphuric acid; and the vegetable astringents, as catechu, kino, uva-ursi, extract of logwood, rhatany, pomegranate bark, &c. The mineral acids, as well as the other astringents, may be conjoined with opium, or other anodynes. A strong solution of alum, and alum whey, for common drink, have been very generally employed by both ancients and moderns.

372. *c. Refrigerants* are required in the more febrile and active states of the disease, as adjuvants, chiefly of depletions and other antiphlogistic remedies. They are further beneficial by acting upon the kidneys. *Nitre*, in considerable or frequently repeated doses, is recommended by GIBBON, DICKSON, HARTMANN, HUFELAND, and many others. It is much used by the Italian physicians, in large doses, conjoined with demulcents. They give from three to five drachms in twenty-four hours. It is also beneficially associated with camphor, the acetate of ammonia, and sweet spirits of nitre, or with the *boracic acid* and with conserve of roses. The *hydrochlorate of ammonia* is equally serviceable, especially in the more passive states of hæmoptysis, and is advantageously conjoined with muriatic acid and tonic infusions. LENTIN advises it to be taken in half a scruple every two hours, with an equal part of extract of liquorice. The internal use of ices or of iced fluids has been advocated by many writers; but, like all other active means, they require discrimination. In the passive states of the disease—where asthenia is apparent, the circulation languid, and the temperature not much above the natural standard, they are injurious.

373. *d. Alvine evacuations* are serviceable by removing morbid matters and obstructions to the portal circulation, and by deriving from the seat of hæmorrhage. *Purgatives* ought, therefore, never to be neglected; and, unless when the hæmoptysis is so abundant as to be alarming, they should precede, or be alternated with astringents; or such of these latter as will not confine the bowels ought to be selected. The exhibition of an *emetic*, previous to the purgative, has been advised, especially by STOLL, DARWIN, PLENCIZ, RANOE, DOEMLING, PAULINI, and SCHMIDTMANN; whilst FRANK and some others think them hazardous. When the hæmorrhage has been already copious, or after blood-letting has been resorted to, an emetic of ipecacuanha, or of sulphate of zinc, or of a combination of both, is serviceable, not only in aiding the arrest of the effusion, but also in evacuating the blood accumulated in the bronchi, and thereby preventing the ill effects which this fluid would produce if it were allowed to remain. It is not merely the vomiting caused by an emetic which is beneficial, but the effect which is produced upon

the heart's action. It is with reference chiefly to this latter operation—to its contra-stimulant action—that emetics and *nauseants* have been recently employed on the Continent, especially in Italy, and by LAENNEC and others in France. In the passive or æsthenic forms of the disease, nauseants, especially the tartar emetic, may be injurious—even in the same case, wherein an emetic of sulphate of zinc might prove of service. As to *purgatives*, the neutral salts with an excess of acids, as the sulphates with sulphuric acid in infusion of roses, or the bitartrate of potash, in the form of electuary, are the most generally appropriate—with the exception perhaps, of oil of turpentine conjoined with castor-oil. These oils are the most beneficial: they may be taken on the surface of an aromatic water or of milk, and be administered in enemata.

374. *e.* In exhibiting *anodynes* or *sedatives* the probability of their being injurious in the asthenic states of hæmoptysis should be recollected. When the powers of the system are inadequate to procure the excretion of the fluid effused into the bronchi, they ought to be given with caution, or in conjunction with tonic astringents, or with expectorants. *Colchicum* has been recently recommended, but it is only in the active states of the disease that it ought to be exhibited. *Digitalis*, however, is more generally prescribed. It is recommended by WITHERING, JONES, F'ERRIAR, HEUSINGER VALENTIN, CARSON, HENRY, HORN, and others. It may be conjoined with astringents, narcotics, or other appropriate remedies. In several instances, and in the case of a physician recently under my care, the *secale cornutum* proved of great service. It was given in doses of five or ten grains every three or four hours; or every hour until an effect was produced. It has been much praised by SPAZANI, NEGRI, and RYAN. *Narcotics* are most serviceable when cough is urgent—by allaying the irritation, and diminishing the risk of the perpetuation or recurrence of the effusion from this cause. But when the hæmorrhage has ceased, and when breathing is difficult, the lungs congested, or the bronchi obstructed by the effused blood, narcotics, especially in large doses, will only retard the discharge of the effused blood, and increase the mischief, unless they be conjoined with expectorants, as the senega, or benzoin, benzoic acid, myrrh, assafoetida, the balsams of Peru or of Tolu, the terebinthinates, or camphor. In the passive stages of the disease, or after large losses of blood, the balsams, both natural and artificial, are often beneficial. The balsam of LOCATELLI is very much employed on the Continent in hæmoptysis, and from its composition it seems very appropriate to most circumstances of the disease. The turpentine is the active

ingredient, not only of it, but of the other artificial balsams prescribed in hæmorrhagic affections. The subjoined is the usual mode of preparing it:—*

405. *e.* There have been various other means recommended for the arrest of hæmoptysis, but many of them are not deserving of notice, and are therefore not here adverted to. The application of *ligatures* on the extremities was a disputed practice with the ancients, although most of them recommended them. J. P. FRANK and J. FRANK approve of them, and direct them to be placed high above the knees and elbows in such cases as admit not of blood-letting, owing either to the profuse hæmorrhage or to constitutional adynamia. *Ipecacuanha* in small doses frequently repeated is praised by LOEFFLER, HENNINGS, AASKOW, KECK, and NIEMANN; and by DE MEZA, and HORN, conjoined with opium; a strong solution of *common salt*, by PERCIVAL, DOEMLING, MICHAELIS, and RUSH; the *turpentine*s by YOUNG, BOYLE, ADAIR, and the author; and the *comfrey*, with aromatic sulphuric acid, by WENDT. With MARRYAT and numerous practitioners, mixtures containing nitre or alum, gums, and some one of the balsams, constituted the principal anti-hæmorrhagic remedies; and vascular depletions were prescribed. It cannot be doubted that blood-letting was formerly often unnecessarily directed in hæmoptysis, or carried too far; but in the active or inflammatory states and early stage of the disease, and when the discharge is scanty or small, it should not be neglected.

Dr. A. T. THOMSON remarks, that when the hæmoptysis “is not of an alarming character, and there is no obvious predisposition to tubercular consumption, especially if it be the consequence of a suppression of the menstrual discharge, it should only be moderated, not checked suddenly, which might induce a congestion in some organ less capable of supporting it with impunity.” This is most dangerous doctrine; for if the hæmorrhage be judiciously treated, the sooner it ceases in consequence the better. Hæmoptysis, in the circumstances stated by this writer, ought to be treated by cautious depletion, derivatives, and other measures calculated to restore any suppressed discharge. The cases are very few in which there is no early indication, or “obvious predisposition to tubercular consumption,” and there are still fewer in which the suppressed discharge is the cause of the pulmonary disease; this latter, in either its more concealed or obvious states,

* No. 11. R. — Olei Olivæ ʒ viij.; Terebinthinæ, Cereæ flavæ, āā ʒiv.; Pulv. subtiliss. Ligni Santali rubri ʒ ss. Ceram in Olei pauxillo solve, dein reliquum, Terebinthinam Lignumque Santali adde, et assidue move donec refrixerunt.

almost always preceding, and even being the chief cause of, the suppression. It should be kept in view, that however moderate the hæmorrhage may appear to be, it is difficult to determine how far it may be attended by infiltration of the bronchi; and that the continuance of it, by filling these vessels, will risk the super-vention of inflammatory irritation or action in them, and often also in the substance of the lungs and pleura; as well as hasten the development and progress of the tubercular productions.

Most obstinate and alarming cases sometimes occur, in which the blood coughed up is blackish, diffuent and abundant, and depression and asthenia extreme. For these cases the turpentine mixture prescribed above (§ 367), with tonics and stimulants are required. In a case of this description to which I was called many years ago, to Lowestoft by Mr. WORTHINGTON, and for which most judicious remedies had been given without avail, these means were quite successful, and the patient is now well.

376. *g.* The practitioner is not to rest satisfied with having fulfilled the first intention — *the arrest of the hæmoptysis* — his attention should immediately afterwards be directed to the *removal of any blood that may have collected in the bronchi, and of whatever inflammatory irritation connected with it either co-etaneously or consecutively, that may exist.* Where crepitation is present, and is much diffused through the lung of one or both sides, more generally of one, fluid is present, and it is either a mucous lymph, or blood, or both, with more or less serum; the state of the expectoration indicating the proportions of either. But the blood may not be expectorated, or may undergo changes previous to expectoration, and clog up the bronchi and air-cells, and either perpetuate inflammatory action, or excite it anew. In the slight forms of hæmoptysis attendant upon tubercles, the effusion of blood is frequently one of the consequences of the inflammatory irritation existing in various parts of the bronchi connected with impaired tone and congestion of parts of the substance of the lungs. Now, by what means is the above consecutive condition to be removed? When the attack has been treated actively, the more antiphlogistic means having been employed, and the lungs still remain embarrassed, manifestly from a portion of the effused blood, or from the fluid subsequently exuded, the exhibition of an *emetic*, and the repetition of it, as circumstances may indicate, will prove most serviceable. If febrile action, heat of skin, &c., be still present, then tartar emetic, ipecacuanha, or both, may be thus employed; but when the vital powers are sunk, and

asthenia is very prominent, the sulphate of zinc should be preferred. In cases characterised by relaxed, thin or weak fibres, and general flabbiness of the soft solids — where bleeding would be injurious, *emetics* are frequently most beneficial. They have been often advised in hæmoptysis; but the indiscriminate or inappropriate use of them, and the somewhat empirical recommendation of them by Dr. MARRYAT, have led to their disuse. I have, however, often prescribed them and the decoction of senega, or the anisated balsam of sulphur, with great benefit. This writer directs two grains of the potassio-tartrate of antimony to be first given, and, as soon as nausea commences, two grains of sulphate of copper, dissolved in a little water. He deprecates blood-letting, and, after the sickness has gone off, gives twenty drops of the balsam of copaiba, night and morning, for several weeks, to prevent a return of the attack, and the size of a nutmeg of the subjoined electuary, twice or thrice a day: — *

I have no doubt of this treatment being quite appropriate to many circumstances of the disease; and, even in those cases where inflammatory action may supervene after the hæmorrhage has ceased, it may prove beneficial, especially if local depletion by cupping or by leeches, if external derivation by blisters, synapisms, terebinthinated epithems or liniments, or by issues or setons; and if suitable regimen, be employed. In order to fulfil the intention stated above as well as to *prevent the return of the hæmorrhage*, the assiduous adoption of these external irritants, the internal use of the balsams or terebinthines, and an emetic occasionally, to unload the bronchi of accumulated fluids or mucosities, will prove most serviceable. At the same time, the digestive and excreting functions ought to receive due attention; and cough or irritation should be allayed by the combination of narcotics and sedatives, as conium, hyoscyamus, opium, &c.; and of emollients or demulcents, with the above, or other suitable medicines. When the hæmoptysis assumes a periodic form, which rarely is observed, the combination of the sulphate of quinine with alum or with sulphate of zinc, or the electuary just prescribed, according to MARRYAT, will generally prove successful.

Dr. LEE, of New York, confided chiefly in *gallic acid* for arresting hæmoptysis, and states that, in the United States, an infusion of the common *witch hazel* (*Hamamelis Virginica*) is often employed for this purpose. It is manifest that the successful employment of either of the numerous means advised in hæmoptysis,

* No. 13. R.—Pulv. Cinchonæ ʒvj.; Sulphuris Sublimati ʒij.; Potassæ Nitratis ʒj.; Oxy-sulphureti Antimonii ʒj.; Muciliaginis Acaciæ, q. s. ut fiat Electuarium.

especially when it assumes the complete form of hæmorrhagic phthisis, will depend upon the appropriate application of it to existing pathological conditions, as intimately as these conditions can be either ascertained or inferred — as vascular depletion, nauseants and emetics in the early stage of phthisis, and only for the robust, plethoric or strong, and when vascular determination or inflammatory action exists, — astringents and derivatives, in more advanced state, when vital tone and cohesion are impaired, — and chalybeate astringents, mineral acids, &c., when, with impaired tone, the crisis of the blood and the amount of hæmato-globulin are diminished. In these last-named circumstances the muriated tincture of iron, in large or frequent doses, with or without an increased proportion of the muriate acid, aided by derivatives &c., will be most beneficial.

In some cases, both in young and in aged persons, but in the latter more frequently, pulmonary consumption is complicated with *disease of the heart*. In these hæmoptysis often occurs. I have had reason to believe that this complication is chiefly caused by masturbation or venereal excesses, especially in young subjects, or when the heart disease has not been connected with rheumatism. In this association, the affection of the heart, as well as the hæmoptysis, requires a decided recourse to chalybeate preparations, especially the Harrogate or Tunbridge mineral waters, or the muriated tincture of iron as now prescribed, or the sulphate of iron with small doses of camphor, or the compound, or the aromatic mixture of iron, with the tincture of aloes, or as much of the decoction of aloes as may preserve an open state of the bowels. In cases also of this complication, the infusion of digitalis is sometimes of service. I have prescribed it with the decoction of senega, when palpitation has been complained of, or with the compound decoction of scoparum, with benefit. If hæmoptysis be excessive or alarming, turpentine or gallic acid, as above prescribed, should be first resorted to (§§ 367, 371).

377. *h.* The *inhalation* of watery or medicated vapours has been recommended in hæmoptysis, and lately employed by both rational and empirical practitioners. I have tried several substances, and in various combinations, through this medium. The practice requires much caution ; but I think it will be found often of service if discrimination as well as perseverance be observed in respect to it. Towards the decline, or in the slighter forms of hæmoptysis, the more astringent substances may be used in this way, care being taken that they neither occasion irritation nor tightness in the thorax nor excite cough. Those which I have tried in this state are — common vinegar, sometimes with a little camphor, or with a small

quantity of turpentine; the pyroligneous acetic acid, creasote and common tar. A small quantity of these were put in an inhaler with hot water, and the vapour inspired in the usual way; or in a large basin, and hot water poured upon them, and the vapour allowed to diffuse itself around the patient. When a terebinthinated epithem, embrocation, or liniment is used, the vapour from it will generally be sufficient. Some time after the hæmorrhage has ceased, the cautious adoption of this practice will be serviceable; and either these or other substances—as benzoin, assafoetida, galbanum, myrrh and other odoriferous resins, or oil of aniseed, may be employed in this way, as directed for the treatment of BRONCHI. In the more *asthenic forms* of the disease, when the expectoration is copious, or is tinged with very dark blood, the diffusion of the vapour of the above substances in the air of the patient's apartment, and the taking of frequent deep inspirations, will frequently prove beneficial. If the patient evince indications of co-existent or consecutive *inflammatory action*, *emollient vapours* (see BRONCHITIS), with the addition of the extract of conium or of hyoscyamus, or of stramonium, to the warm fluids employed for inhalation, will be extremely useful, especially if cough be severe.

378. *C.* The *regimen* during and after hæmoptysis is a most important part of the treatment.—*a.* The ancients advised cooling beverages and diet. They allowed acid wine, and acerb or acid fruits. The *pomegranate* was much and deservedly praised by them, on account of its cooling and astringent operation. Glutinous and mucilaginous articles of diet were also recommended. All these deserve adoption. The principal question is, as to the diet which should be adopted. Dr. STEWART, some years ago, advised nourishing diet, cold sponging the surface, cold bathing, and exercise in the open air, and frequently with advantage. To persons of a relaxed habit, with a slow or natural pulse, and to those not suffering from febrile action, this plan is generally appropriate; very dilute acids, or lemonade, or common vinegar and water, being the usual beverage. He directed the whole surface of the body to be sponged in the morning; and the neck, breast, and shoulders at night, with tepid vinegar and water, gradually reducing the temperature to that of the surrounding air. After the sponging, frictions with flannel or the flesh-brush for half an hour were enjoined. Cold bathing and salt-water bathing were afterwards employed and continued until recovery took place. Dr. STEWART advised this method in both febrile and non-febrile—in acute and chronic cases. In the non-febrile and chronic it is often serviceable, and, early in

the febrile, it may also be occasionally useful. Sponging the surface, and assiduous friction immediately afterwards, are applicable to most cases; but the diet requires greater discrimination. Where fever is present, animal food increases the patient's ailments. In those, farinaceous, glutinous, or mucilaginous substances only should be allowed, with goats' whey, stale butter-milk, grapes, raisins, the fruit of the carob or St. John's bean, asses' milk with Seltzer-water, apple-tea, new milk or skimmed milk with lime-water, &c.

379. *b.* The propriety of having recourse to small depletions, or to a moderate blood-letting, about each equinox, in order to prevent the recurrence of hæmoptysis, has been insisted on by some writers, and when the effusion depends chiefly upon plethora or active vascular determination to the lungs, the practice may be of service; but when it occurs in the progress of tubercular phthisis, it may be injurious if indiscriminately adopted, although it may be of use in those cases in which subacute inflammatory action, or congestion of portions of the lungs often complicate the tubercular formations, and occasion the sanguineous discharge. In the more advanced stages, or asthenic states, vascular depletion favours the progress of the tubercles, and is more or less injurious. The regulation of the excretions; the restoration of suppressed evacuations or accustomed secretions; issues or setons or open blisters; occasional change of air; residence in a mild, and equable climate; sea-voyaging; gentle exercise in the open air; flannel clothing next the skin; cold sponging the surface; acidulated drinks; light and nourishing food; mental quietude, and the avoidance of whatever depresses the vital powers, are severally productive of benefit; some of them ought not to be dispensed with. Exertions of the voice, playing on wind instruments, venereal indulgences, warm baths, and exposure to vicissitudes of the weather and season ought always to be shunned.

ii. TREATMENT OF PULMONARY CONSUMPTION COMPLICATED WITH INFLAMMATION OF PORTIONS OF THE LUNGS, OR OF THE PLEURA, OR THE AIR PASSAGES.

410. Pulmonary phthisis is often attended, at some period of its course, with inflammation, either of a portion of the lung, or of the pleura, or of the air-passages, or of a combination of these, in the form either of partial or limited broncho-pneumonitis or of pleura-pneumonitis. These complications often require means of an anti-phlogistic nature, in some respects the same as those just advised. It should, however, be recollected that the inflammatory action in

these parts, and the consequences of this morbid action, owing to its asthenic or congestive character, to previous disease, to impaired constitutional power, and to various associated morbid conditions, generally admit not of the same treatment as that which is found beneficial in idiopathic or sthenic states of inflammation. When morbid vascular action extends from the tuberculated portion of the lungs, to the pleura covering it, the usual symptoms of partial pleuritis, especially pain in or near the situation, febrile action, &c. (§ 129), usually appear. The inflammatory state of both the infiltrated portion of the lung, and of the implicated pleura, generally passes into a chronic form, and the exudation from the affected portion of the pulmonary pleura often agglutinates it to the opposite portion of the costal pleura, thereby limiting the extension of the mischief and forming adhesions between them. In these complications, whether pneumonitic or pleuritic or both, vascular depletions, unless they be small and local, are seldom of much service; but when thus limited, they are often beneficial, especially at an early stage and in robust persons, and in these their repetition may be required. In most complications of this kind, especially when *pain* is complained of, after small bleedings, by cupping or leeches, have been practised, in cases for which they are required, blisters repeated or kept open, or the continued application of the terebinthinate embrocation (§ 339) are of the greatest benefit. The advantage following mercurial and antimonial preparations in combination, and sometimes also anodynes, demulcents, &c., in the intervals between the exhibition of the former, ought to be kept in view.

381. In rare cases softening of one or more tubercles near the pleural surface of a portion of the lung is followed by *empyema*, or by perforation of the pleura over the softened tubercle: in this latter case the air is pumped into the pleural cavity, causing *pneuma-thorax*, and generally soon terminating life by compression of the lungs, auricles of the heart, and large vessels. Although the results in these cases are soon fatal, yet cases are recorded in which life was prolonged for many months, and it is not impossible for recovery to take place, or at least a recovery of some years' duration to occur, after *pneuma-thorax* has supervened, either by closing of the perforation in the pleura, by exudation of lymph, the absorption of the air, and by adhesion of the opposite surfaces. In cases of this nature the only chance of recovery is by the removal of the air contained in the pleural cavity by an operation, in order to give a chance and sufficient time for lymph to be exuded from

the vicinity of the perforation by which the perforation may be closed.*

382. In some instances (and several have occurred in the course of my practice) *asthma* has been followed by one or other of the forms of phthisis; the asthma having been of various or prolonged continuance, most frequently of a hemorrhhal form. Generally the advent and progress of phthisis in such cases are insidious and slow, until an advanced stage is reached, and then the progress of disease becomes rapid. In most instances this complication is characterised by the sudden accession of paroxysms of dyspnœa, and feeling of suffocation, by the character of the expectoration, and by the physical signs as the disease advances. The *treatment* of this complication consists of prescribing ipecacuanha and camphor, in urgent cases, the former being given so as to excite vomiting, or the preparations of lobelia, or those of belladonna, or the sulphate of zinc with camphor and extract of stramonium or other narcotics or anodynes. In some cases, the burning in the patient's apartment of blotting paper which had been immersed in a strong solution of nitre, or the diffusion through the apartment of the fumes of substances mentioned when noticing the use of fumigation, is often of service in shortening or relieving the paroxysm. But as the disease assumes a more phthisical character, these generally fail to produce any alleviation. Both previously and subsequently to the development of this state, repeated blisters, or blisters kept open, or issues &c., and the means advised for the usual or protracted forms of phthisis (§ 362) are sometimes of more or less benefit.

383. In the course of phthisis, the occurrence of an attack of *influenza* or of *whooping-cough*, aggravates more or less the original disease, and generally develops a latent or slow or chronic state into a febrile and acute form: and either of these complaints, especially when affecting the scrofulous diathesis, often induces pulmonary consumption, or when other causes either have predisposed to or have

* In 1833, I was called in consultation to a case of pneuma-thorax, in an early stage of phthisis, the patient being a young and robust man, and not having lost flesh or strength, but of a scrofulous taint: the heart was pushed remarkably far to the right side, and the rational and physical signs were all marked and extreme, the dyspnœa and distress were great. I advised an opening to be made for the exit of the air; and the friends of the patient desired Sir A. COOPER should make it. We met a few hours afterwards: he admitted his ignorance of the nature of the malady. I fully explained the cause and consequence of the disease, and the extreme urgency of the case; but he refused to operate. Having heard Sir ASTLEY's determination, the patient and his friends would not allow the operation to be resorted to by any one else; and the patient died asphyxied, some hours afterwards. If the operation had been resorted to in this case, life might have been prolonged for some time, if not for a long period.

concurrent in producing this malady. The severity and particular form of phthisis thus developed generally depend upon the constitution of the patient and the character of the antecedent disorder, as regards severity or duration. In some instances, especially in highly predisposed or scrofulous patients, the phthisical attack appears rather as a termination than as a complication of these complaints.—The treatment of these associations is nearly the same as that just now stated. Ipecacuanha, or sulphate of zinc, sometimes in emetic doses; camphor and sulphate of quinine; the anisate of sulphur; turpentine embrocations, or blisters, or warm or rubefacient plasters, between the shoulders, or over the sternum; alkalies with tonics, or with the decoction of senega; the compound galbanum pill, with the compound iron pill, or the compound rhubarb pill, &c., are amongst the most suitable means.

384. Cough is often a most distressing symptom, not only in these complications, but also in the advanced stages of phthisis, and more particularly when attended by dyspnœa. When cough is comparatively slight, compound tincture of camphor, or hydrocyanic acid, or extract of conium or of hyoscyamus, will often give relief. The preparations of aniseed, more particularly the anisate of sulphur, have long been used for relieving cough and even dyspnœa. Dr. WATSON states that the late Dr. PROUT preferred an infusion of three drachms or half an ounce of the bruised seeds of aniseed in half a pint of distilled water, at a temperature of 120°, allowing it to stand until it is cold, to the preparations in common use. This infusion may be made an excellent vehicle for the medicines just mentioned, or may be given with the decoction of senega. But the severer attacks of cough in the advanced stages require more energetic means, especially the preparations of opium or of morphia. These, however, particularly morphia, often are followed by unpleasant symptoms, if they be not conjoined with aromatics and gentle stimulants,—with small doses of camphor, of spirits or oil of carraway, of lavender, of aniseed, &c. Opium may be given in the form of the *confectio opii*, or conjoined with the *confectio aromatica*; or with the *pilula galbani composita*, &c. The *pilula styracis composita*, or the *pilula saponis composita*, is in these circumstances appropriate, and may be associated with other means. I have also often prescribed* a solution of the acetate

* No. 12. R. — *Morphiæ Acetatis* gr. iv.; *Liquoris Ammoniacæ Acetatis* ʒvj.; *Acidi Acetici diluti* ʒj.; *Spirit. Anisi* ʒij.; *Spirit. Carui, et Spir. Lavend. Comp.*, āā, ʒij.; *Mist. Camphoræ (vel Syrupi Tolutani)* ad ʒij. *Misce. Sumatur* ʒj. pro dose, vel ij. horâ decubitus et ʒj. primo mane, in aquæ hordei cyatho vinario.

of morphia with aromatics to counteract the depression or headache sometimes produced by it.

385. *C. The Laryngeal and Tracheal Complications as well as the Bronchial associations of Phthisis*, are often the most distressing of those which occur in the course of this malady. In some of the more protracted forms of phthisis they present more or less of the characters noticed above (§§ 126, *et seq.*), or of the sub-acute or chronic states described hereafter when treating of laryngeal and tracheal consumption. But as the laryngeal affection is most commonly a complication occurring in the course of phthisis, I may so far briefly notice at this place the treatment which I have found most beneficial for it, reserving a more detailed account of the means required for the primary and associated states of chronic laryngitis until "*Laryngeal Consumption*" comes under consideration.

The laryngeal and tracheal complication is generally at first characterised by irritation, rather than by true inflammatory action, whether sub-acute or chronic, most frequently caused by the cough and expectoration, by the sympathetic affection of the pharynx and larynx, and by the susceptibility of the mucous lining of the larynx and trachea. At an early stage, therefore, of this complication attention should be directed, in the first place, to the functions of the stomach and bowels, with which the affection of the throat and respiratory passages often sympathise during incipient phthisis; and morbid secretions and excretions ought to be evacuated from the stomach and bowels by an ipecacuanha emetic, and by stomachic aperients, such as the compound infusions of gentian and senna with alkalies, or powders consisting chiefly of rhubarb and magnesia, or the compound decoction of aloes, &c. Afterwards the embrocation prescribed above (No. 4) may be applied upon flannel over the throat and sternum; and a linctus of various demulcents be prescribed, with anodynes and small doses of the muriate of ammonia, or of nitrate of soda or potash. In order to allay irritation and cough, the means just mentioned may be used, or those prescribed under the head of *Laryngeal Phthisis*. Inhalation, lotions, &c., as there noticed may be resorted to if these fail; but they, as well as the more energetic means which have been recently employed, should be reserved for the idiopathic disease, or for the more obstinate and severe cases, for they are very rarely of service in the laryngeal affections which are symptomatic of pulmonary consumption. The *complication of phthisis with bronchitis* is so general as to require no further consideration than it has received already, and in the chapters devoted in the *Third Part* of this work to the forms and treatment of bronchitis.

iii. THE COMPLICATION OF PHTHISIS WITH DISEASE OF THE
ABDOMINAL ORGANS, ETC.

386. The abdominal complications of phthisis have been partly considered when noticing the treatment of the impaired digestion and assimilation (§ 321), and of the diarrhoea (§ 345) so generally observed previously to, and in the course of, the malady. But the functions of the liver are often not sufficiently discharged in the course of the disease; and due attention has not hitherto been directed to them. That this organ has been long disordered in phthisical cases is shown by the nature of the organic lesions it generally presents after death (§ 134). It has been insisted upon by an able and close observer of the causes and nature of disease (Dr. McCORMAC, of Belfast), that phthisis is not only caused, but is also perpetuated, by an imperfect supply, and an insufficient digestion and assimilation of pure air in and by the lungs; consequently, the red globules of the blood are not oxygenated and assimilated to such an extent or amount as to supply the requisite materials by their waste for the elaboration of healthy bile: owing also to this cause, the carbonaceous and hydrogenous elements are not sufficiently combined with the oxygen of the respired air, so as to contribute to healthy assimilation and nutrition; and they consequently, under the influence of life, form morbid or adventitious products, and give rise to the fatty enlargement of the liver so generally found after death.

387. The great importance of promoting the digestive and assimilating processes from the very commencement of phthisis, whatever other means of treatment be adopted, will appear from what has been advanced above: and I know of no surer means of attaining this end, than by improving the secretions and excretions by suitable medicines and food, by chalybeates and other tonics, and by removing the patient to a high, dry, and temperate air, where he may enjoy the advantages of sunshine and exercise, and avoid those causes which reduce organic nervous or vital power. In general, physicians have been during the last half century, in which such wonderful advances have been made in the practical sciences, so much occupied in listening to sounds which they often could neither interpret aright nor refer to their proper sources—in splitting the diagnostic hairs floating before their troubled, if not always dazzled vision, and in hearing what they believed even when not believing what they heard,—as to be carried along by

pathology in fashion, neglecting those great views of physiological pathology which alone furnish the true basis of rational and successful practice. Whilst a murmur, a bruit, a râle, a ronchus, and every sound for which a term could be coined, and their various grades, cadences, &c., were heard, or were feigned to be heard, the conditions of the vital powers and functions, upon which both disease and recovery from disease mainly depend, were entirely neglected. But attention to these latter, to the states of the secretions and excretions, to the manifestations of impaired vital power, to the causes of this impairment, to the removal of those causes, and to the true means of restoring lost energy, as regarded a malady the most fatal, the most prevalent, and the most constant in its prevalence, was practically discarded; and fussy manipulations, striking examinations,—where such examinations and manipulations were often unnecessary—were paraded before the patient and his friends in the place of these, and of other more profound, more physiological, and more practical investigations.

388.-*E.* Several *other complications of phthisis*, of less frequent occurrence than the above, have been mentioned (§§ 135 *et seq.*); but the means appropriate to each will readily suggest themselves to the physician. *Edema* of the extremities (§ 136) not unfrequently occurs in the advanced stages of phthisis, and is sometimes diminished by frictions of the surface with suitable liniments, and by small doses of biborate of soda, or of potash with tonic infusions, or diuretics, or with the means employed for the disease. Pressure on the course of the veins of the lower extremities, by the sitting or other posture of the body, sometimes favours the œdema, and even occasions a permanent obstruction of these vessels. The complication with *hæmorrhoids*, or with *fistula in ano* (§ 138), is most suitably treated with sulphur, with or without magnesia, or with the bitartrate of potash, or confection of senna, and various combinations of them.

CHAP. XVIII.

BRIEF REMARKS ON SOME OF THE REMEDIES, ETC., ADVISED FOR TUBERCULAR PHTHISIS.*

HAVING considered the treatment which appears the most suited to the several forms and stages of phthisis, I am next desirous to notice the means which have been recommended by writers for this dis-

* I have arranged these remedies alphabetically.

ease, and to mention the circumstances or states of the malady in which, according to my experience, they may be prescribed, and in which they are contra-indicated. Most of these medicines have been prescribed empirically in phthisis; for, although the treatment of the disease had assumed a rational aspect in the works of our countrymen BENNET and MORTON, there were few besides, even among the most eminent of medical writers, who presented us with a plan of cure which was even tolerably appropriate to the stages and states of the disease; and even amongst those who had cultivated the most the diagnosis and pathology of this malady, there were very few who recommended their favourite remedies with due reference to the states and complications of the disease, and to the pathological conditions which they had themselves described or admitted. I shall, therefore, attempt to inquire, in my brief notices of the remedies recommended, into the circumstances in which either experience or the operation of these remedies warrants their use.

i. NOTICES OF MEDICINAL SUBSTANCES USED FOR PHTHISIS.

389. *Acids*.—Most of the *mineral and vegetable acids* have been employed in phthisis, but seldom with any definite object, or to fulfil a rational indication. The chief intention with which they have been prescribed in recent times is to repress or prevent hæmoptysis, or to act as a refrigerant when the febrile action is considerable, and the night-sweats exhausting. They are merely palliatives—and in this they often fail, and sometimes they even render the cough harder and more severe; and, with the exceptions of the hydrocyanic and boracic acids, they are injurious to the sub-inflammatory states, and in the inflammatory complications of the disease. The *acetic acid* has long been employed in phthisis; and when the contra-indications just mentioned do not prevent recourse to it, either simply or in the form of raspberry-vinegar, or oxymel, more or less diluted, it is a grateful and cooling medicine, especially after hæmoptysis has been considerable or excessive. In states of great exhaustion, or colliquation, when it is desirable to produce an antiseptic as well as an astringent effect, the pyroligneous acetic acid may be given, or even a drop of the aromatic, with suitable tonics and restoratives.

390. *Sulphuric acid*, much diluted, has been commonly prescribed in phthisis, and generally with the same object as the acetic. BANG gave it with mucilages; JOERDENS with the Phellandrium aquaticum, a medicine much employed in Germany for this disease,

and PORTAL in states of weak dilution, as a cooling drink; ROLLO and HUFELAND considered it useless; but COLLBATCH, GRANT, DE HAEN, HOME, FOTHERGILL, SIMMONS, SIMS, and MARX entertained a more favourable opinion of it, especially in the form of *acidum sulphuricum aromaticum*, or *vitriolic elixir*. QUARIN very justly cautions against its use in the more inflammatory states and complications of the disease. Weak dilutions of the *nitric* and the *hydrochloric* acids may be prescribed, in the same states as those which admit of the use of the foregoing; and the combination of the two—one part of the former to two of the latter—when the contra-indications mentioned above are not present; and, when exhaustion, colliquation, and other symptoms of vital depression are urgent, these two may be added to the infusion of cinchona, or other restoratives, especially when the functions of the liver are much impaired. I have prescribed them with benefit in such cases, and often given the cod-liver oil on the surface of a mixture of these or of similar substances.

391. *Hydrocyanic acid* is one of the most useful medicines in this disease. It was introduced into practice by MAGENDIE, GRANVILLE, and ELLIOTSON, who took a just view of its effects both in phthisis and in dyspepsia—complaints so intimately allied in their origins and in their pathology, as already shown. Its influence in the latter benefits the former, whilst it exerts a soothing effect on the cough, without aggravating, but rather ameliorating, any complication which may appear in the course of the malady. It may, moreover, be advantageously conjoined with other acids, with the neutral salines, most of which it is incapable of decomposing, and with the great majority of other medicines usually prescribed for phthisis. Of the other acids, the most important are the *citric*, the *benzoic*, and *boracic*. The *citric* is serviceable in the states of the disease for which the acetic is given; but, either in the pure form, or as it exists in lemon juice, it is most useful as an adjunct to beverages, or in combination with the alkalies. In these latter states it aids, with other means, in preventing, counteracting, or removing the morbid conditions of the circulating fluids in the advanced stages of phthisis. *Benzoic acid* has been frequently advised in various combinations for this disease, but has rarely been confided in alone. It is chiefly in the more asthenic and colliquative conditions that it is at all of service. I have seen more benefit from the *boracic*, than from benzoic acid. Either of these acids may be given conjoined with mucilaginous, balsamic, and expectorant medicines, when these are indicated. The boracic acid and its alkaline salts—the biborate of soda, and b. of potass—are not contra-indicated

by the inflammatory diathesis, and may be given in those states in which the mineral acids are inappropriate. I have found the *dilute phosphoric acid* of much service in the few cases in which I have tried it. It may be prescribed in doses of 20 to 40 minims in cases of phthisis characterised by vital depression or exhaustion, especially when the disease appeared to result from depressing causes or from masturbation. For such, it may be given in the infusion of absinthium, or of ginseng root, with or without the addition of the tincture of sumbul.

392. *Aconite* was first prescribed for phthisis by PORTAL, who afterwards relinquished the use of it. BUSCH gave the powder of the dried leaves in doses of two grains every two or three hours, and increased the dose until a drachm was taken in the twenty-four hours. I have prescribed the powder in smaller doses in a few cases; and the extract in doses of a quarter of a grain in others, cautiously increasing the dose; but I have ventured upon it only in the more inflammatory states as a substitute for bleeding. I cannot say that it was so beneficial as BUSCH and HAREL DU TANE-RAL have stated it to have been. It had, however, the effect of lowering the pulse, of causing perspiration, of diminishing pain, and of affording ease; and, although I cannot view it, with the writers just mentioned, as a cure for phthisis, yet I consider it as an excellent medicine in the more inflammatory states and complications of the disease, when prudently exhibited, or when its doses are increased, or its use interrupted and resumed from time to time, as circumstances require.

393. *Alkalies and alkaline salts* are serviceable in several states of phthisis. The former, and their sub-carbonates, were much praised by BARKER and SPALDING. I have often prescribed the liquor potassæ, and BRANDISH's alkaline solution in the scrofulous forms of the disease, with sarsaparilla, demulcents, and narcotics, and, in the protracted form, with tonics or bitters and anodynes, with temporary and sometimes permanent benefit. In certain states, and more particularly when the blood is probably more or less contaminated by the passage into it of morbid matters from the lungs, the alkalies are often advantageously combined with tonics: and various bitter infusions may be given with the solutions of the neutral salts, as the bicarbonate of potass, with the nitrate, or the solution of the acetate with the carbonate of ammonia, and with the other substances now mentioned.

394. *Ammoniacum* was frequently prescribed in phthisis, and often injudiciously, especially in combination with squills or other heating gum-resins. It should be given only in the more chronic

states of the disease, and even in these with caution, and rarely with the medicines now mentioned. I have prescribed it * with benefit when an expectorant was required, and when no inflammatory complication existed; but if the cough became severe or hard during its use, it was always relinquished.

395. *Balsams* have been long in use in chronic pectoral diseases, and especially in phthisis; and although they are sometimes of service, they are as often injurious, unless they be given with great discrimination. Under this denomination the *copaiba*, the *Peruvian*, and the *tolu balsams* fall more strictly; the others more correctly belong to the terebinthines and to the gum-resins, and to these likewise the older writers often extended the term. The circumstances, and the combinations in which the balsams, and even the other substances often ranked in the same category, may be prescribed in phthisis, are the same as those which I have stated in respect of the exhibition of ammoniacum (§ 394). When it is considered that these medicines, and others closely allied to them are appropriate only in certain states of the malady, that an empirical use of them may be as often injurious as beneficial, we should not be surprised at finding them recommended by DE HAEN, GODBOLD, SIMMONS, RUSH, &c.; and denounced by FOTHERGILL, FRIZE, and others. The *copaiba balsam* was preferred by FULLER, HOFFMANN, MONRO, and GESNER; but it is now seldom prescribed for phthisis. A substance becomes a remedy only by its appropriate use. *Barytes, the hydrochlorate*, has been recommended in phthisis by HUFELAND, HERZ, and CRAWFORD; but, although it has been prescribed by many, yet no satisfactory result has been adduced respecting it.

396. *Bitters and tonic infusions*, as those of absinthium, gentian,

* No. 13. R.—Ammoniaci ʒjss. tere cum Aq. Destill. ʒivss.; dein adde Vini Antimonialis ʒij.; Liq. Ammoniac acetatis (vel citratis) ʒij.; Tinct. Conii (vel Tinct. Hyoscyami) ʒij.; Syrupi Althææ officinalis ad ʒviij. Misce. Fiat mistura, cujus capiat cochl. j. vel ij. larga, 4tis vel 6tis horis.

No. 14. R.—Ammoniaci ʒjss.; Tinct. Benzoini Comp. ʒij.; Tinct. Camphoræ Comp. ʒss.; Aquæ Flor. Aurantii, Aq. Sambuci, āā, ʒij. Tere bene, et adde Tinct. Conii ʒjss.; Acidi Hydrocyanici diluti ʒss.; Syrupi Tolutani ʒj.; Syrupi Althææ officinalis ad ʒviij. Misce. Capiat cochl. j. amplum, 3tis vel 4tis horis.

No. 15. R.—Ammoniaci, Balsami Sulphuris Anisati, āā, ʒj.; Extr. Hyoscyami (vel Conii) ʒij.; Saponis Castil. ʒss.; Extr. Glycyrrh. ʒss. Misce. Fiant, secundum artem, Pilulæ l. quarum capiat unam vel duas, omni 4ta vel 6ta hora.

No. 16. R.—Ammoniaci, Galbani, Extr. Conii, Saponis Castil. āā, ʒss.; Fol. Belladonnæ gr. xv.; Antimonii Potassio-tart. gr. iij. Contunde bene, et fiant secundum artem Pilulæ xxxvj. Sumantur binæ ter in die. (The pills prescribed by RICHTER for tubercular phthisis.)

calumba, chereita, &c., have been advised for phthisis by CÆLIUS AURELIANUS, CHALMERS, SALVATORI, RUSH, MAY, and PEARS, generally also with a nourishing and digestible diet. Although too generally and empirically prescribed by these and other writers, yet these medicines are often required in the usual and more chronic states of the disease, especially with the view of removing the symptoms of indigestion so frequently attending phthisis from its commencement, and of supporting the vital powers. These infusions, moreover, may be made the vehicles in which other medicines, whether saline, anodyne, or alterative, or narcotic, may be prescribed.

397. *Camphor* was given in phthisis by BURSERIUS; by MARX, with nitre and hydrochlorate of ammonia; and by KORTUM with this latter salt. It is useful chiefly as an adjunct to other more appropriate medicines, or when it is given with the object of abating urgent symptoms. In small doses it is beneficial, especially when conjoined with nitre, the spirits of nitric æther, and solution of the acetate of ammonia, in allaying febrile action and inflammatory complications. In larger doses, and combined with the sesquicarbonate of ammonia, it is of service in the advanced stage of phthisis, in rallying the vital power and in counteracting morbid conditions of the blood, whilst it promotes expectoration; and with the extract of conium or of henbane, or with a preparation of opium, it allays irritation, both locally and generally.

398. *Carbon* or *charcoal* was formerly much employed in the colliquative states of phthisis, in dysentery, and in putro-adyamic fevers. I have given it at an early period of my practice in several cases, but generally with camphor, chalk, cascarilla, and aromatics, in doses varying from a scruple to a drachm; and chiefly with the intention of correcting the fœtor of the excretions. SOBERNHEIM states that SCHOENLEIN gave it in phthisis with digitalis; and GARRETT prescribed it with sulphur and the extract of the smaller centaury. I suspect, however, that whatever benefit resulted from these combinations cannot be imputed to the carbon. M. JOURDAN justly remarks: "Lorsque les théories chimiques régnaient en médecine, on attribuait au charbon végétal puissantes vertus dans la phthisie pulmonaire, la dyssenterie, et surtout les maladies putrides. Le temps n'a justifié aucune des espérances qu'on avait conçues à cet égard."

399. *Cascarilla* was often prescribed with the same intention as cinchona and medicines last noticed. I have given it only in the form of infusion in the more colliquative states and non-febrile

forms of phthisis, and have generally made this preparation the vehicle for such other medicines as the peculiarities of the case suggested. Cascarilla has received the approbation of THILENIUS, WENDT, KRUGELSTEIN, and HECKER, in the usual and more chronic forms of the disease, indeed, in the states for which I have prescribed it. The historical sketch I have given above will sufficiently show the diversity of opinions as to the propriety of employing the tonic and astringent barks in phthisis; and more particularly as to the use of cinchona, &c.

400. *Chalybeates* have been already mentioned in connection with the states of the disease in which they may be prescribed. They have been recommended by GRIFFITH, GUNTHER, STANGER, SCHALLER, VELSEN, and many others. The compound mixture of iron, the ammonia-citrate of iron, the ammonia-chloride of iron, the sulphate of iron, the solution of the pernitrate of iron, the potassio-tartrate of iron, the tinctures of the acetate and of the muriate of iron, and the compound pills of iron, are severally of use in certain stages of phthisis; but there are few medicines which require greater discrimination and caution in their use in this disease than they. Cases which proceed from vitally depressing and exhausting causes, or in which the blood is poor in red globules, or which are free from inflammatory or hæmoptysic complications, are often benefited by chalybeates, as well as by other tonics, especially if dyspeptic symptoms are prominent; but their effects upon the cough, expectoration, breathing, pulse, and the accompanying hectic, should be carefully watched; and any aggravation of these should cause the discontinuance of these medicines and the adoption of other means. The good effects of chalybeates may be aided by other medicines, with which they may be conjoined according to the stage and complications and other peculiarities of the case.

The tincture of the muriate of iron may thus be given with the tincture of calumba or quassia, or with hydrocyanic acid, or with both in a wine-glass of water, on the surface of which cod-liver oil may also be taken. I have prescribed the hypophosphites of iron, but without benefit. They require caution.

401. *Cinchona*. Whilst DESAULT, DE MEZA, and ROMANS considered it injurious, and FOTHERGILL said that it was rarely of use, QUARIN, VOGEL, RAULIN, MARX, JAEGER, HORN, SCHMIDTMANN, and others, recommended it. HALLER, HOME, and CHAPMAN prescribed cinchona with a milk and vegetable diet. CALLISEN gave it with a powerful stimulant, the oil of asphaltum, of which notice will be taken hereafter; THOMANN with opiates; and RYAN and MAY with

animal food. STOLL advised cinchona, when inflammatory symptoms were absent, and SIMMONS when the expectoration was abundant and puriform. METTERNICH preferred the extract, and gave it in large doses. In more recent times the *sulphate of quina* has been substituted for the preparations of cinchona, in phthisis as well as in other diseases; but I doubt the advantage of the substitution as respects this malady, for the infusion, the decoction, the extract, and the compound tincture of cinchona furnished the physician with the means of selection according to the features of the case for which he was prescribing. However, the sulphate of quina is an excellent medicine, when it is desirable to have recourse at the same time to an acid and to an astringent: and then it may be given in the compound infusion of roses, or with sulphuric acid, and at the same time also, as advised by GUENTHER, AMELUNG, DROSTE, and some other German writers, with the tincture of digitalis or the powder of digitalis in the form of pill. I have prescribed it, with small doses of camphor and conium, or henbane, with benefit in some states of the disease.

402. *Conium* has, from the days of STOERCK down to the present time, been more generally employed in phthisis and scrofula than perhaps any other medicine. It has been praised by QUARIN, ZEVIANI, FOTHERGILL, ADAIR, BUTTER, BUSCH, HUFELAND, and many others; and yet there are few medicines whose effects in phthisis are more equivocal, and, as usually employed, are more uncertain. At the present day it is seldom confided in alone; and when given as an adjunct to other means it is often in insufficient doses, or in imperfect states of preparation, and not persisted in for the time required to evince its effects.

403. *Creasote* has been recommended for phthisis by SCHROEN, REICHENBACH, CARTONI, RAMPOLD, and others. I have employed it, since its introduction to medical practice, chiefly as an adjuvant of other means in the last stage of the disease, and for the mitigation of the disorders of the stomach and bowels,—of nausea, vomiting, diarrhœa, &c. It is also of great benefit when used to slightly impregnate the air of the apartment in which the patient chiefly resides (§ 369, 377). Creasote, however, should not be prescribed in circumstances contra-indicating chalybeates and tonics,—when the cough is dry, hard, or constrictive,—when a state of erethism or of active congestion is inferred, and when an inflammatory complication or active hæmoptysis is present. It is chiefly in the colliquative or asthenic conditions of phthisis, that it is a valuable adjunct of other means, and especially when the excretions are

more or less foetid, and the circulation is contaminated by the passage of morbid matters into it from the primary seat of disease.

404. *Digitalis* has been recommended by some, and praised by others, for phthisis. Indeed there is, perhaps, no other medicine which has been more generally employed in this disease, and whose operation has been less understood, than *digitalis*,—has, in short, been more empirically prescribed. It has been sanctioned by BEDDOES, WITHERING, DARWIN, FERRIAR, SPENCE, FOWLER, KINGLAKE, MAGENNIS, MEYER, and THOMAS. Dr. DRAKE says that citric acid counteracts its unpleasant or cumulative effects, when given in too frequent or too large doses. Whilst the above, and many continental writers, are favourable to the use of *digitalis* in phthisis, BREE and BAILEY contend that it is injurious in some cases and useless in others. I have, however, seen some benefit derived from the infusion, prescribed at first in very large, and afterwards in rapidly diminished doses; especially in the hæmoptysic and febrile states, and in the congestive and inflammatory complications of the disease. *Dulcamara* was advised for phthisis by BURSERIUS, and afterwards by STARK, RICHTER, and HUFELAND, who generally gave it in conjunction with the Iceland moss.

405. *Emetics* have been recommended for phthisis from the days of HIPPOCRATES to the present time. MORTON, BRYAN-ROBINSON, MARRYAT, SIMMONS, SIMS, KENTISH, MARET, REID, METTERNICH, SWEDIAUR, PARR, RICHTER, DUMAS, &c., advise emetics at an early stage of the disease; some, as REID, BAYLE, and others, with a frequency which appears to be excessive or even injurious; others as YOUNG, CLARK, WITT, &c., in a more moderate and rational manner. Many physicians in Italy, early in the present century, pretended to have cured phthisis by the exhibition of a solution of tartar emetic, in the infusion of the flowers of the *Sambucus nigra*, or in other emollient infusions—generally three grains of the former in six ounces of the latter. A quantity sufficient to produce vomiting was directed night and morning, and milk and water were drank freely. If diarrhœa supervened, *digitalis* and *ipecacuanha* were prescribed in small and frequent doses, with other means calculated to moderate or arrest the diarrhœa, and the emetic tartar was relinquished.

Emetics are often of service, especially in the early stage of the malady; but they should be prescribed with caution, and with strict reference to the functions of the stomach and liver, and to the assimilative and vital powers. I have already mentioned those which may be preferred; but even they ought not to be given so

as to impair digestion and assimilation; and if these functions be weakened by them, or in cases where this risk appears great, mild tonics and a restorative and digestible diet, aided by external derivation, should be prescribed. In the advanced stages of phthisis, emetics are of more doubtful advantage, but even in these they may be of service. BLUMENBACH recommended them even in the third stage; but either in this, or in an earlier period, they sometimes constitute an important part of rational practice, especially if appropriately selected, when the digestive mucous surface appears to be loaded by sordes, when the expectoration is difficult or scanty, the breathing suffocative or oppressed, and the biliary secretion interrupted, or deficient in the evacuations. But even in these circumstances, vital power should not be exhausted by a too frequent recourse to them, and the digestive functions ought to be restored soon afterwards by suitable tonics and anodynes, as the infusion and tincture of calumba, or of chereita, or of other bitter tonics, with hydrocyanic acid, conium, &c.; or with one of the vegetable extracts, the purified oxgall, &c., in the form of pill. *Ipecacuanha* is useful in phthisis, not merely as an emetic, but as a nauseant, expectorant, and promoter of digestion, and as a corrector of morbid actions in the bowels, according to its dose and mode of administration. As a nauseant it was praised by PIDERIT, BARBARI, and others; and it certainly is a valuable medicine in the more inflammatory and hæmoptysic states of the disease; and in the form of pill with bitter tonics and anodynes, or astringents when the bowels are much relaxed.

406. *The iodides*, especially the iodide of potass, have been employed in phthisis, but are appropriate only in the more chronic states of the disease. Since the discovery of iodine, the use of its preparations in scrofula had extended to tubercular consumption. The earlier prescribers of this substance, and of iodides generally, erred in giving them in too large doses, in scrofulous and other diseases, and in neglecting to conjoin them with a sufficient quantity of alkalies, whereby the irritating effects of the iodine, or the decomposition of the iodide, by the acids of the stomach, might be prevented. Thus, even when a very small dose of the iodide of potass is prescribed in a vehicle suited to the features of the case, the solution of potass or the bicarbonate should be given in sufficient quantity to prevent the decomposition of the iodide. Whatever form or combination of iodine is given in phthisis, the effect upon the digestive functions, the pulse, and the cough should be watched, and if it induce dyspeptic symptoms, or aggravate those

already present, it should either be relinquished, or the dose of it much reduced. *The karageen moss*, or *Fucus crispus*, has been long employed as a popular remedy in consumption, and it has been favourably noticed by M. BÉRAL, myself, and others. It, as well as others among the fuci, may be used as a demulcent in this disease, with some benefit, probably arising in part from the minute quantity of iodine this class of sea-weed contains.

407. *The Lichen islandicus* has been very commonly used in consumptive cases by QUARIN, BERGIUS, THILENIUS, MARX, REGNAULT, RICHTER, SCHMIDTMANN, CRICHTON, and others. It is one of the most generally useful medicines in this disease; its bitter, demulcent, and tonic properties, divested of exciting action, rarely proving injurious, even in the more febrile cases. WENDT, myself and others, prescribed it with milk, adding to these such other medicines as the circumstances of the case required. SACHTLEBEN recommended a decoction of three ounces each of the lichen and of the *Polygala amara*, of six drachms of liquorice root, and of three drachms of *dulcamara*, to be made with milk, as a preferable mode of prescribing the lichen in consumption. The decoction of these substances is best made with water to which a small quantity of the carbonate or solution of potash is added, boiled milk being added to the strained decoction, and such anodynes, or other remedies, as the peculiarities of the case suggest.

408. *Lactucarium* was much employed by DUNCAN, ROTHAMMEL, and FRANCOIS to allay the cough in phthisis and bronchitis, and was considered appropriate in the inflammatory state of the disease. It may be given under almost any circumstances with this intention and may be conjoined with *ipecacuanha*, *digitalis*, demulcents, mild tonics or bitters, or other medicines suited to the case.

409. *Lead, the acetate of*, has been often prescribed in phthisis, but chiefly with the view of arresting hæmoptysis, and it has then been given either with opium and *ipecacuanha* in the form of pill, or in solution with the addition of acetic acid. These combinations of acetate have been advised by KOPP, STARK, ETTMULLER, AMELUNG, HILDENBRAND, HORN, and others. WEBER prescribed the acetate with *digitalis*, myrrh, balsam of Peru, extract of helenium, and mucilage, in the form of pills. HOFFMANN preferred the phosphate of lead, in the dose of a grain, to the acetate, and conjoined it with the extract of henbane.

410. *Lime water* and the *muriate of lime* were advised by QUARIN, MARX, BEDDOES, and HUFELAND. Lime water, or efferves-

cing lime water (*Carara water*), is very advantageously given with milk, new or boiled, especially when the bowels are much relaxed. For this state of the malady not only may catechu, kino, and other means already recommended for it be employed, but the nitrate of silver, the extract of nux vomica, tar made into pills with liquorice powder, &c., also be individually tried.

411. *Mercurials* are occasionally of service in phthisis, especially in certain states of the disease; and when judiciously combined with other medicines. Mercury with chalk, the blue pill, or Plummer's pill, will be of service, when the biliary functions are torpid, either alone or with soap and taraxacum, or with the compound rhubarb pill, or with the aloes and myrrh pill, when the digestive functions require to be assisted. In the more inflammatory states or complications of the disease calomel may be prescribed, as advised by BEDDOES; although it should not be pushed so far as to produce salivation, as recommended by RUSH, unless the disease be consequent upon syphilis; when the very unfavourable state of the malady may require this decided treatment. When partial pneumonitis, or pleuritis, or pneumo-pleuritis complicate phthisis, then calomel may be employed, and be beneficially conjoined with antimonials, or with ipecacuanha, or with opium, or with other narcotics. The beneficial effects of the bichloride of mercury, prescribed in the decoction, or in either of the tinctures of cinchona, in scrofulous cases, have induced me, as well as other physicians, to employ the same combination in the more manifestly scrofulous states of phthisis; and in some instances with much benefit; but, in my own cases, as other means were also employed, especially the external treatment about to be noticed, the amount of benefit derived from the former could hardly be determined. SCHAEFFER and VALENTIN have also given the bichloride with tonics and opium in phthisis, and, as they conceived, with advantage.

412. *Myrrh* and various gum-resins, especially *asafœtida*, *galbanum*, &c., are most appropriate in the more chronic or protracted forms of phthisis, when they are attended by dyspnœa or difficult expectoration, and in females when the catamenia are painful or scanty; or when the disease has been caused by depressing or exhausting causes. They are contra-indicated during inflammatory states and complications, and in the febrile forms of the malady: and are best suited to the circumstances of the disease which admit of chalybeates, tonics, balsams, cinchona, &c. In the form of GRIFFITH'S mixture (§ 400), or when conjoined, as in the compound galbanum, or compound iron pill, or when further

combined, as with soap, extract of conium, or extract of henbane, they are sometimes of service.

413. *The oils*, especially *fish oils*, have only recently been employed in consumptive diseases, although they have been long previously used in other disorders. HANKEL appears to have been the first to prescribe the *cod-liver oil* in phthisis in Germany, and Professor BENNETT in Edinburgh, to whom the credit of having first recommended it is clearly due. Contemporary with the earliest employment of it in this country, it was prescribed for a lady, whom I frequently saw in consultation with my friend Dr. BAIRD; and at that time it was not to be had in London, Mr. MORSON having procured it, at our request, from the continent. Since then I have employed it in this and several other diseases; and have always seen more or less benefit derived from it, especially in the more usual, and in the protracted, states of phthisis. It may be given in various ways; but generally with greatest benefit, from an hour to two hours after a meal, in the dose of half an ounce or even more for an adult, on the surface of any agreeable vehicle,—as of water with a few drops of the muriated tincture of iron, or an infusion of orange peel, or of any bitter tonic or aromatic infusion, with either a little acid or carbonate or citrate of an alkali, and any anodyne, &c.; or on the surface of milk, or of ginger or orange wine, &c. This oil may be taken twice or thrice daily, and in all stages of the disease. After continuing it for some days or weeks, it may be intermitted for a few days, and medical treatment may then be directed more especially to the digestive functions, and to the promotion of the biliary and intestinal secretions and excretions; and after such intermission, its use should be resumed and continued for a time which the state of the case and its effects will indicate.

414. All the *fish oils*, especially the oils from the livers of the *torsk*, *cod*, and other fish which I have enumerated above (§ 325) are beneficial in phthisis, especially when they are recent, or fresh, and then they may be taken in larger quantity. The common use of fish oils in the most northerly countries of Europe probably is partly the cause of the infrequency of phthisis in those countries. The use of vegetable oils, especially *olive oil*, in countries near the Mediterranean, and in the north of Africa, may have the effect of diminishing the number of phthisical cases in those countries; and the adoption of the *palm oil nut*, as an article of food, in Western Africa, and of the oil for daily inunction of the surface of the body, may have a similar effect on the natives of that part of

the world. It is not unlikely that other mild vegetable oils, as *linseed*, *almond*, &c., may also prove of service when taken in sufficient quantity and when judiciously conjoined with other medicines. Formerly the *oil of asphaltum* or of bitumen was often prescribed for phthisis, especially by CALLISEN, BANG, THILENIUS, HEALDE, and others. QUARIN said that it was only slightly palliative, whilst FRIZE considered it injurious. It was probably employed then, as other things have been used recently, or are praised now, merely with the object of being, with their abettors, talked of.

415. *Opium* and *opiates*, in various forms, have been advised in phthisis by many writers, and condemned by others. There are, however, states of the disease which indicate the propriety of having recourse to them, and circumstances which contra-indicate their use. They are more frequently injurious than beneficial in the first stage of the disease, although TRALLES has given a different opinion. Sometimes in the second stage, but most frequently in the third stage, opiates, or even the preparations of morphia, are of great service; but much of the benefit produced by them will depend upon the combinations in which they are prescribed. MARCUS gave them with myrrh and Peruvian balsam, and, in the advanced and more chronic states of phthisis, this combination, or that with the compound galbanum pill, and the compound soap pill, will be appropriate. PEART advised opiates to be given with the carbonate of ammonia, æther, and aloes; and J. FRANK laudanum, with the aromatic sulphuric acid. In the third stage of the disease, preparations containing more or less opium, especially the compound tincture of camphor, the compound styrax pill, pills of ipecacuanha and opium, &c.; and when diarrhoea is present, the opiated cretaceous powder, the compound cretaceous powder with opium, the compound ipecacuanha powder, the compound kino powder, or the combination of opium with the extract of nux vomica, or with the nitrate of silver, or with the sulphate of copper, or with the sulphate of zinc, will be found individually of service, when judiciously prescribed. When there is much debility, opiates should not be given in full doses, unless they be combined with aromatics, tonics, or stimulants, or with balsams or gum-resins; and when the preparations of morphia are preferred to other opiates, then this recommendation should be especially kept in recollection, because I have seen much distress result from its neglect.

416. *The Phillandrium aquaticum*, or water hemlock, especially the seeds and herb, has been much recommended for phthisis by STERN, OSWALD, FISCHER, J. FRANK, RICAMIER, ROSENEÜLLER, HENNING, MICHAELIS, &c., who have employed chiefly the powder of the seeds, in doses of ten to twenty grains, the decoction and tincture. Its action is stimulant, narcotic, and diuretic. Some of the authorities now adduced have given this medicine with sulphur. LANGE prescribed it, after bleeding, in robust or plethoric cases, in goat's milk twice or thrice daily; HERZ, with nitrate of potash, sugar of milk, and gum Arabic, thrice daily; and HUFELAND, MÜLLER, CHIAPPA, REMER, BERKUN, and HEINE, in various forms and combinations,—in powder, decoction and tincture.

417. *The Polygala amara* has been much praised in phthisis by THILENIUS, PLENCIZ, COLLIN, BAUME, FRIZE, &c., and is certainly to be preferred to the *Polygala senega* in this disease, as it is more tonic and pectoral than this latter. It was formerly much employed in consumptive diseases; but has now fallen into undeserved neglect. The root is chiefly used; and either in powder (from fifteen to thirty grains), or in extract, or infusion, or decoction, in which forms it is directed in several of the continental pharmacopæias. The *Polygala senega* is much more stimulating than the *P. amara*, and is not appropriate in the more inflammatory and complicated states of phthisis, unless it be given with ipecacuanha, or with antimonials, so as to occasion nausea or vomiting. The decoction is, however, of use, not only when prescribed with this intention, but also in the less febrile and more chronic forms, or in the advanced stages and complicated cases, when it is desirable to promote expectoration, or to relieve dyspnœa; and in these circumstances it may be conjoined with the solution of the acetate or the citrate of ammonia, with orange-flower water, or with hydrocyanic acid, or conium, or the compound tincture of camphor, or with other anodynes, as the peculiarities of the case will suggest.

418. *Salix*, &c.—Besides the barks already mentioned (§§ 399, 401), others, especially the *willow*, the *cedar*, the *larch* and *fir-barks* have also been employed in phthisis, but they are useful chiefly as tonics and astringents, and have few other virtues to recommend them. GOURRAUD and SCHNEIDER advised an extract of the middle bark of the *willow* in this disease; and the *cedar* and *pomegranate* barks were prescribed, not merely as tonics in phthisis, but also with the object of destroying intestinal worms, with which this disease is sometimes complicated, especially in low, cold, and damp localities.

419. *Sage* is an old and popular remedy for coughs and colds: it was also much used in pulmonary consumption. It is by no means a bad adjunct to other medicines, and may be advantageously combined with the decoction of *marsh mallows*, in which form it was prescribed by QUARIN and others.

420. *Salts and saline solutions* of various kinds have been prescribed for phthisis, with the intention of moderating the hectic and other symptoms, rather than with hopes of curing the disease, although several of them may be as rationally considered capable of effecting this latter object as many other medicines which have been employed with this expectation. Of this class of substances none are more generally useful than the solution of the acetate of ammonia, and of the citrates of the fixed alkalies, of ammonia, and of magnesia. The solution of *acetate or citrate of ammonia* is of service chiefly in the early stage of phthisis, and may be prescribed, according to the state of the case, with the nitrate of potash, sweet spirits of nitre, and camphor mixture, with hydrocyanic acid, or with compound camphor mixture, or with conium, henbane, &c. In more advanced or chronic states the ammonia of the acetate may be given in excess, and tonic infusions or other restorative medicines substituted for some of those now mentioned. The *citrates of potass*, of *soda*, and of *magnesia* are of service, either individually or with the nitrate of potass, and the other substances enumerated, chiefly in advanced stages of the disease, when the blood becomes contaminated by the absorption of morbid materials. In similar states of phthisis the *carbonates of the alkalies* are also of service, especially when given with the *nitrate of potash*, or with the *chlorate of potash*, in solution or in vehicles — bitter, tonic, or demulcent — suitable to the requirements of particular cases. The *hydrochlorate of ammonia* was much employed by THILENIUS and MARK in phthisis, as well as in all forms of hectic and in some other fevers, periodic and continued; and was a favourite remedy in these diseases among German physicians early in the present century. It is an excellent adjunct to demulcents, linctuses, &c., in the laryngeal complication of phthisis.

421. The *Secale cornutum* has been found very efficacious in arresting the hæmorrhage in the hæmoptysic stages of phthisis. Dr. T——, who had been for many years subject to attacks of hæmoptysis, had recourse, and generally with success, to the secale, in doses of five grains, at intervals of a few minutes, until the discharge began to cease. It was not until at a far advanced period of

life, and when travelling on the railway, that he was disappointed in the effects of this remedy, for he always carried it on his person. I saw him on his arrival in town, and prescribed oil of turpentine. The hæmorrhage returned some time afterwards, and produced suffocation. I had an opportunity of examining the lungs. The appearances are noticed in another place (§ 105). The hæmorrhage proceeded from ulcerated vessels.

422. *Sulphur* was formerly much employed in phthisis, and was prescribed either in combination with myrrh and various balsams, gum-resins, or powders, or in the form of a balsam, or electuary, prepared with an essential oil, as the oil of aniseed, or with honey or syrup, and given with such other medicines — demulcent, emollient, anodyne, absorbent, or narcotic — as the state of the case suggested. The anisated balsam of sulphur especially, and other combinations of this substance, were strongly recommended by ETTMULLER, BUSCH, SIMS, AGRICOLA, ROLLO, and others. HUNOLD prescribed it with charcoal in the advanced stage of the disease. The *anisated balsam of sulphur*, the preparation most frequently used, consisted of one part of the flower of sulphur, and four parts of oil of aniseed, which were digested in a sand-bath. If diarrhœa was present, the sulphur was given with preparations of chalk, or with astringents and tonics. Sulphur has long since fallen into disuse in phthisis; but I have seen much benefit from it in several states of the disease, when judiciously combined and prescribed.

423. *Tartar emetic* was prescribed by SCHLEGEL in small and frequent doses, and was probably employed by him and others on account of the apparent benefit derived from it and other antimonials in the inflammatory complications of the disease. The contra-stimulant doctrine in vogue in Italy at the end of the last century, and in France at the commencement of this, carried the use of tartar emetic in diseases of excited action to an extravagant height; and, very probably, more injury than advantage was derived from it, owing to its improper use. However, in the more inflammatory, and in the more active hæmorrhagic, states of the malady, it is often of service when given either as an emetic, or in frequent small doses, as a contra-stimulant.

424. *Tussilago farfara* has been for ages a popular remedy for chronic coughs and consumptions; and the several parts of the plant have been used in the forms of infusion, decoction, electuaries, syrups, &c., for these complaints. It was recommended for phthisis by PERCIVAL, REUSNER, KRAMER, and others; and the mucilaginous,

bitter, and mildly tonic virtues of the plant appear to warrant their recommendation.

425. *Turpentine*, in the various modes of its existence, from the essential oil through the terebinthinate balsams to the pine-tops, tar and tar-water, have been for ages found of benefit in various states of phthisis, some in certain states, and others in other states. These substances, in their several modes of employment, are often of service, not only when exhibited internally, but also when employed externally, and when the much diluted vapour, or even the odour from them, is inhaled into the lungs. In the hæmoptysic states of phthisis, when it is proper to arrest the hæmorrhage, there is no remedy that is more certainly efficacious than turpentine, when exhibited in small and frequently repeated doses, epithems of the same substance being applied over the chest. It may be taken in doses varying from twenty minims to a drachm every hour, or two or three hours, according to the urgency of the case; or even oftener, either mixed in honey and liquorice powder, as prescribed by GASSER and myself, and as advised in a memoir on the use of this medicine published in 1820 in the London Medical and Physical Journal; or as directed in a case lately attended by Mr. W. BARNWELL and myself.*

426. The quantity of the oil may be diminished or increased, or the frequency of the dose increased or otherwise, according to the circumstances of the case. These circumstances also should suggest the medicinal substances which may be prescribed along with it; for I have given it in various combinations, not only in this disease, but also in several other maladies †, where it appeared to be required. There are almost no complications of phthisis which contra-indicate the use of this remedy, when judiciously given, as respects the dose and mode of exhibition; and especially when employed externally also as hereafter recommended. The terebinthinate substances, in which the essential oil exists in different

* No. 17. R.—Olei Terebinthinæ ʒiss.; Spirit. Ætheris Sulphurici Comp. ʒij.; Pulv. Tragacanth. Comp. ʒijss.; Mist. Camphoræ ʒij.; Syrupi Rosæ et Syrupi Tolutani, āā, ʒjss.; Aquæ destillatæ ad ʒvj. Misce. Fiat mistura, cujus sumatur pars quarta, quartâ quaque hora.

† No. 18. R.—Olei Terebinthinæ ʒij. ad ʒss.; Camphoræ gr. vj. ad gr. xii.; Spirit. Ætheris Sulph. Comp. ʒss.; Tinct. Lavand. Comp. ʒij. (vel Tinct. Guaiaci Comp. ʒij. vel Tinct. Cinchonæ Comp. ʒss.); Olei Cajuputi ℥xv. ad ℥xx.; Tere cum Mucilag. Acaciæ ʒj.; Pulv. Tragacanth Comp. ʒij.; Pulv. Glycyrrh. ʒss.; Syrupi Rosæ, et Syrupi Tolutani, āā, ʒj. ad ʒij.; Aquæ Rosæ ʒij.; Aquæ Destillatæ (vel Infusi, vel Decocti Cinchonæ, vel Infusi Cascarillæ) ad ʒviij. Misce. Fiat Mistura cujus sumatur Cochl. j. largum, omni horâ, vel 3tis, 5tis, vel 6tis horis, prius agitatâ phialâ.

forms and combinations, are also beneficial when suitably prescribed. The infusion of *pine tops* was praised by CÆLIUS AURELIANUS for phthisis; *tar water* was recommended by Bishop BERKELEY for this and other diseases; and *tar* was given by SIMS for this malady. I have had recourse to these, especially to tar and tar-water. Tar, in the form of pill, with liquorice powder, is often of great service in the colliquative states of diarrhœa, and when there is reason to fear incipient ulceration of the mucous follicles of the bowels. Tar-water, when sufficiently weak, or not to be unpleasant to the patient, is also of service in this state of the disease, and in its hæmorrhagic and congestive complications. Indeed there are several states of this malady, and several other diseases, in which both tar and tar-water may be very usefully employed. The injudicious or rather extravagant praises of some writers at the commencement of the last century, and its inappropriate use subsequently, have caused the complete disuse of this remedy in the present day.

427. *Uva ursi*, in powder, decoction, and extract, was recommended for phthisis by Dr. BOURNE, and subsequently by Drs. HAMILTON and DAVY. The tannic and gallic acids it contains, and its astringent and tonic qualities, would justify its use in several states of this disease, especially in the hæmoptysic, and in the colliquative sweats and diarrhœa which occur in the advanced stages. It may, moreover, be combined with other remedies,—demulcent, tonic, and anodyne,—with opiates, bitters, &c., according to the peculiarities of the case.

428. *Venesection* and other modes of vascular depletion, as by cupping or leeches, or by the application of these last to the anus, as insisted on by PLENCIZ and LÄKEREN, aided by antiphlogistics, emollients, and demulcents, have been advised by many in the early stage of the malady. At this stage, and for complicated inflammatory states, venesection, hardly amounting to more than six, eight or ten ounces at a time, and repeated according to circumstances, and to its effects, has been recommended by MORTON, MEAD, PRINGLE, MONRO, FOTHERGILL, SALVADORI, STOLL, HOSACK, FARR, CHEYNE, and others. I have stated above (§§ 367, 380) the circumstances in which the practice may be adopted; and that it should not always be accompanied with other antiphlogistic remedies, either in an early stage, or when prescribed for inflammatory or hæmorrhagic complications; for depletion, although manifestly indicated, may be followed, in many cases, by suitable tonics and nutrients, pro-

vided that exercise be taken with due care in the open air, and that the *external derivation* about to be noticed (§ 439), such as issues or setons, be kept discharging. RUSH advised, for cases requiring venesection, recourse to it in preference, in spring and autumn. But this recommendation is in conformity rather with an old custom than with correct pathological inference. RHODIUS, TRACY, and RUSH considered an attack of hæmorrhage from the nares, rectum, or even from the lungs, beneficial, and the larger the better, and that it should not be too soon arrested, unless manifestly injurious. The opinion is certainly often correct, but the exceptions should not be overlooked.

429. *Various other substances* have been prescribed for phthisis by eminent writers; and although they may be of little use, further than as adjuncts to other more beneficial remedies, they may be very briefly enumerated at this place. The *Arum tryphyllum* was recommended by BURTON, in the form of decoction with milk; the *Carduus benedictus*, either in decoction, infusion, or extract, with senega, by THILENIUS; the *Eryngium campestre*, by HOFFMANN; the *Geum urbanum*, by BUCKHAVE, in doses of a scruple and upwards of the powder of the root, as a tonic and astringent; the tops and flowers of *hypericum*, for its balsamic, bitter, and tonic qualities, by LINNEUS; the *Nasturtium aquaticum*, by POUTEAU, and BRILLONET; *myrrh*, conjoined with *sulphur*, or various other substances, by numerous writers; the *Rhus radicans*, by GIBSON; the *raphanus* or horse-radish, by SCHENCK and OSIANDER; the *Marubium vulgare*, by ALIBERT, a popular remedy, in various forms of preparation, for pectoral complaints in most European countries; the conserve and other preparations of *roses*, by MOSELEY and very many other writers; the *phosphoric acid*, by GOEDIN; the *sulphate of iron*, by STANGER; and *taraxacum*, by SCHMIDTMANN. These hardly require any remark. They may be employed under circumstances which prevent the use of other more beneficial remedies; or in conjunction with such means as have already been advised, as with the Iceland moss, digitalis, conium, &c., or with bitters, as absinthium, calumba, cascarilla, arnica, &c., when a restorative diet is required, or when indigestion, flatulence, or sinking are experienced. In certain states of complications, as in those just named, the preparations of ammonia, as the carbonate, &c., or the æthers, may be conjoined with other means with benefit. Of the ethereal preparations, the compound spirit of sulphuric æther, the spirits of nitric æther, and the hydrochloric æther are the most

useful. In cases where I have prescribed the hydrochloric or nitro-hydrochloric acids, with or without the hydrocyanic acid, I have often added the hydrochloric or other æthers when the state of the case required such an addition.

The *Wild cherry bark*, and the *Black snake root* have been prescribed for pulmonary consumption in America. The latter (*Cimicifuga racemosa*) is stated by Dr. LEE to have been long a popular remedy in the United States for phthisis, and highly recommended by able practitioners, in several communications to medical journals. "It is believed to allay pulmonic irritation like the wild cherry bark, and to exert a sedative influence on the circulation." Dr. HILDRETH employs it in the early stages of the disease in connection with iodine. Dr. LEE also states "that the *wild cherry bark* deserves a favourable mention for its admirable combination of sedative and tonic properties. The cold infusion of the inner bark of the *Cerasus serotina* has long had a high reputation in this country in cases of general debility, with feeble digestion and quick pulse, and especially in pulmonary consumption. It rarely fails to lessen the frequency and increase the force of the pulse, while it invigorates all the functions." Professor WOOD remarks that "few remedies are better adapted to hectic fever, from whatever source it may proceed." The best preparation is the cold infusion, made with half an ounce of the bark to a pint of water, and given in doses of two ounces three or four times a day. It is beneficially taken with cod-liver oil.

ii. NOTICES OF MINERAL WATERS ADVISED FOR PHTHISIS.

430. *Mineral waters* have been recommended for phthisis by several authors; but they require much caution and consideration before entering upon the use of any of them, when the disease has fully declared itself. In the scrofulous diathesis, and when the disease is threatened, or when its prevention should be attempted, mineral waters are of great benefit, when taken in proper quantity, and in suitable dilution in certain cases. The quantity of these waters usually recommended is often not duly regulated, or suited to the nature of the case, nor is the use of them always congruous with the medicines and diet advised: hence they are sometimes either inefficacious or injurious.

There are three kinds of mineral waters, which, when used in proper quantity and combination, and their effects watched, are

beneficial both in the prevention and in the treatment of the early stages of phthisis; these are the *chalybeate*, the *sulphureous*, and the *alkaline*; each, however, being suited only to certain states or forms of the disease. It should not, however, be overlooked, that all these waters contain various proportions of different saline ingredients,—the oxides or salts of iron, or sulphuretted hydrogen, or alkaline carbonates, being present in certain of these waters also in various proportions.

431. *a.* The *chalybeate mineral waters* are chiefly indicated in those states of the disease for which the compound iron mixture has been recommended above (§§ 335, 400), more especially in lymphatic and phlegmatic temperaments, and when the pulse is weak, small, or slow, and the blood poor in red globules. Generally the weaker chalybeates, or the stronger more or less diluted, are most beneficial, and should be preferred for cases where their use is of doubtful propriety. The mineral waters of *Aix-la-Chapelle*, especially the sulphuretted chalybeate, have been recommended for this class of cases: but the mineral waters of this country, of a similar composition, are equally appropriate with those; especially the chalybeate and saline springs at *Harrowgate*, which may be taken alternately with the sulphureous waters of that place. The mineral waters of *Kissengen* are also of service early in the disease, or when phthisis is threatened, especially when the several springs are employed under judicious medical direction.

432. *b.* *Sulphureous mineral waters* are very often beneficial in phthisis, especially when the several springs containing sulphuretted hydrogen gas are appropriately employed for individual cases. The several springs at *Harrowgate* supply a sufficient variety of composition to suit the various states of different cases.* The waters of

* Since the publication of the above remarks, in my work on "*Practical Medicine*," on the use of mineral waters in consumption, I have had occasion to visit *Harrowgate*, and to inquire into the medical virtues of its mineral springs, into its topography, soil, and climate. I had previously had considerable experience of the efficacy of these waters in several diseases, and when I visited *Harrowgate* in September, 1860, I found several old patients of mine who were renewing their acquaintance with this most agreeable and healthy place, and with its mineral waters. High *Harrowgate* is situate on an elevated plain, nearly equally distant from the east and west coasts. Its soil is dry and sandy, resting on porous coarse sandstone. Its climate is dry and temperate, especially from April to November or December. Low *Harrowgate* lies in a basin, and is well sheltered from high winds, especially from the east and north-east winds. Its atmosphere is also remarkable for dryness and purity. Both High and Low *Harrowgate* consist of open terraces, with pleasant prospects on both sides. The neighbourhood possesses many interesting objects, and scenes of great beauty, as well as of picturesque effect, within easy riding or walking distances. The waters are, however, the chief

Moffat and *Strathpeffer* are stronger in sulphur than those of Harrowgate, but they present a less variety of composition. The

attractions. I consider Harrowgate to be, as respects its air, soil, climate, and mineral springs, by far the most important watering-place in this country, and unequalled by any on the continent of Europe, for the diversity and curative influence of its waters, in a large number of diseases.

These waters may be *classed* according to their chemical composition, conformably with the analysis of Professor HOFMANN. So diversified are these springs, and yet, individually, so constant in their composition, so entirely free from any contingent change or artificial admixture—so entirely the products of deeply-seated sources—that it becomes necessary, but by no means difficult, to arrange them so as to employ them appropriately to the constitution and temperament of individuals, and to the peculiarities and stages of a wide range of diseases.

Class 1 comprises "*the strong sulphureous waters*," of which two are commonly resorted to—viz. the "old well," the strongest of the sulphur waters, and the "Montpellier strong sulphur well." These waters are stimulant, aperient, diuretic, alterative, sedative and specific, but their effects vary with the quantity taken, the mode of having recourse to them, the peculiarities of the case, and state of the patient. The most satisfactory manner of taking these waters is by adding a quantity of hot water to them, according to the intention of the prescriber, and the feelings of the patient. If an aperient effect be required, water of a temperature of 210° or 212° may be added; but when an alterative action is desired, as in tubercular consumption or scrofula, they may be taken cold, or their temperature slightly raised, and in smaller quantities at one time. Used thus internally they are beneficial for the first and second stages of consumption, for scrofula, latent or open, for glandular inflammations or enlargements, for the scaly and other chronic cutaneous eruptions, for chronic gout and rheumatism, for chronic bronchitis, and for torpid states of the liver. This class of waters is also beneficial when used as warm baths or warm douches, and for warm sponging, in cutaneous and scrofulous affections, and in gout and rheumatism.

Class 2 comprises the "*mild sulphur waters*," of which there are a number, with more or less alkaline or earthy impregnations. These waters may be taken in the manner just stated, and for the same complaints. They are also beneficial for calculous formations, chronic disorders of the kidneys and bladder, and for dyspeptic and hepatic affections.

Class 3 consists of "*saline chalybeate waters*." They are more or less aperient and restorative, but also stimulant, deobstruent, and alterative, according to the mode of prescribing them. That usually now named the "*Montpelier Kissingen water*," is as aperient as the sulphur waters, but it is also decidedly restorative and tonic, and both prevents and removes disorders of the digestive organs, and morbid conditions of the blood, and of the secreting and excreting organs.

Class 4 comprises the "*pure chalybeate waters*." They are generally useful in all such cases and circumstances for which chalybeates are indicated. This class and the *third class* are most useful in cases of boils and carbuncles, especially when the "Montpellier Kissingen" is taken in the morning, and the chalybeate in the afternoon.

In conclusion I may state that, independently of its waters, that Harrowgate enjoys the advantages insisted upon by Dr. RUSH, whose experience and success in the treatment of phthisis, have not been exceeded in more recent times, namely, "a high, dry and temperate locality, removed from the sea in all cases of the disease." When the Harrowgate waters are judiciously prescribed, as to dilution, quantity, succession and

waters of *Engghien* and *Barèges* may also be tried, but they offer even fewer advantages than those already mentioned.

continuance, and are aided by a suitable amount of exercise in the open air, they are beneficial not only for the diseases above mentioned, but also for improving the diathesis and constitution, and for preventing these diseases, more particularly those which have been under consideration. But in order that persons visiting this admirable watering-place for their health should enjoy all the benefits it is capable of imparting, I would recommend them to have recourse to the advice of the able and experienced medical men residents in it. I am able to speak, from intimate acquaintance, of the great knowledge and ability of Mr. BERRY and Dr. MYRTLE, to whom, and to the publication of Dr. KENNION, I am indebted for more information, as to the benefits which the Harrowgate waters are capable of affording, than I can state in the limits to which I am here necessarily confined. The following are the tables of the composition of the Harrowgate waters, according to their analysis by Professor HOFMANN:—

HARROWGATE SULPHUR SPRINGS.

GRAINS OF SALINE CONSTITUENTS IN THE GALLON OF WATER.

	I. Old Sulphur Well.	II. Montpelier Strong Sulphur Well.	III. Montpelier Mild Sulphur Well.	IV. Hospital Strong Sulphur Spring.	V. Hospital Mild Sulphur Spring.	VI. Starbeck Sulphur Spa.
Sulphate of lime . . .	182	594	12.104	5.166	1.215	870
Carbonate of lime . . .	12.365	24.182	20.457	25.560	19.794	6.960
Fluoride of calcium . . .	trace.	trace.	trace.	trace.	—	faint trace.
Chloride of calcium . . .	81.735	61.910	—	—	—	—
Chloride of magnesium . . .	55.693	54.667	17.140	11.595	336	—
Carbonate of magnesia . . .	—	—	3.251	5.797	10.310	5.390
Chloride of potassium . . .	64.701	5.750	3.975	10.751	24.970	—
Carbonate of potassa . . .	—	—	—	—	—	12.207
Chloride of sodium . . .	866.180	803.093	232.413	369.014	220.630	121.798
Bromide of sodium . . .	trace.	—	trace.	trace.	trace.	trace.
Iodide of sodium . . .	trace.	—	trace.	trace.	trace.	trace.
Sulphide of sodium . . .	15.479	14.414	3.398	7.155	301	1.711
Carbonate of soda . . .	—	—	—	—	—	5.133
Ammonia	trace.	trace.	trace.	trace.	trace.	trace.
Carbonate of iron . . .	trace.	trace.	trace.	1.060	trace.	trace.
Carbonate of manganese . . .	trace.	trace.	trace.	trace.	trace.	trace.
Silica	246	1.846	165	535	1.49	1.753
Organic matter . . .	trace.	trace.	trace.	1.327	trace.	1.740
Total	1096.581	966.456	292.903	437.960	279.045	57.562

TOTAL VOLUME (IN CUBIC INCHES) OF SULPHURETTED HYDROGEN IN THE GALLON.

I.—Old Sulphur Well	26.9
II.—Montpelier Strong Sulphur Well	25.4
III.—Montpelier Mild Sulphur Well	5.262
IV.—Hospital Strong Sulphur Spring	10.888
V.—Hospital Mild Sulphur Spring	3.54
VI.—Starbeck Sulphur Spa	2.103

433. Dr. LEE (U. S.) remarks that there are many mineral springs in the United States of North America which are reputed beneficial in phthisis, especially the chalybeate waters of Saratoga, and the sulphur and saline springs of Virginia. These have the reputation of reducing the frequency of the pulse, and of tranquillising pulmonic irritation. The sulphur springs also of Richfield, Sharon, and Avon, are also deserving of notice in phthisical cases.

434. *c.* The mineral springs abounding in the *carbonates of the alkalies*, as well as holding various other substances in solution,

CHALYBEATE WATERS.

GRAINS OF SALINE CONSTITUENTS IN THE GALLON OF WATER.

	I. Montpellier Saline Chalybeate Water.	II. Cheltenham Saline Chalybeate Water.	III. Tewit Well.	IV. St. John's Well.
Sulphate of lime . . .	—	—	·697	·307
Carbonate of lime . . .	—	7·604	1·435	2·264
Fluoride of calcium . .	—	trace.	—	?
Chloride of calcium . .	159·278	51·629	—	—
Chloride of magnesium .	35·635	34·027	—	—
Carbonate of magnesia .	41·796	—	2·667	3·039
Chloride of potassium .	11·383	27·410	1·323	—
Carbonate of potassa . .	—	—	1·057	·991
Chloride of sodium . . .	656·838	158·840	·280	1·543
Bromide of sodium . . .	trace.	trace.	trace.	—
Iodide of sodium . . .	trace.	trace.	trace.	—
Carbonate of soda . . .	—	—	—	1·338
Ammonia	trace.	trace.	trace.	trace.
Carbonate of iron . . .	2·790	4·627	1·358	·609
Carbonate of manganese .	trace.	trace.	trace.	?
Silica	·947	1·450	1·041	trace.
Organic matter	trace.	·282	·663	trace.
Total	908·067	285·869	11·021	10·091

CUBIC INCHES OF THE GASES IN THE GALLON OF WATER.

	I. Montpellier Saline Chalybeate Water.	II. Cheltenham Saline Chalybeate Water.	III. Tewit Well.	IV. St. John's Well.
Carbonic acid	24·17	19·50	11·85	14·95
Carbonetted hydrogen . .	2·40	5·00	—	·15
Oxygen	·51	} 1·02	0·40	·67
Nitrogen	6·48		5·53	6·35
Total	33·56	25·52	17·78	22·12

have likewise been recommended for threatened and incipient phthisis. The chief of these are the waters of *Ems*, *Seltzer*, and *Vichi*. These are usually most beneficial when taken with milk or with whey. The Ems waters are much praised by BRUCHMAN and others; and the Seltzer by BANG and KRAMER, in this disease, especially when diluted with milk or whey. The waters of *Cauterets* have also been recommended by many; and those of *Bonnes* and *St. Sauveur* of the Pyrenees, have proved most beneficial in several instances which have come before me. Whatever mineral water be adopted, other means, medicinal, regimenal, and dietetic, are generally also required. Some advantage, moreover, is derived by consumptive invalids from change of scene and of modes of living, and from dryness of the air and elevation above the level of the sea, when they visit some of the inland or continental watering-places. Increased exercise in the open air and in open day and sunshine is also not devoid of some benefit.

iii. INHALEATIONS AND FUMIGATIONS.

435. *A. Inhalation of air containing increased proportions of oxygen gas.*—Soon after the discovery of oxygen the most sanguine ideas of the efficacy of this agent in various diseases were entertained. It was recommended by BEDDOES and HILL in consumption, scurvy, and various other diseases, but CHAPTAL, FOURCROY, and others declared it to have been injurious in phthisis. It may, however, prove of service in asthma, or in its complication with phthisis, and in certain states of asphyxia. If employed in any of the diseases of the respiratory apparatus, it should be with much caution, not only as respects the proportions of oxygen to atmospheric air, but as regards also its physiological and medical effects. The risk of inflammatory complications resulting from oxygenous inhalations is chiefly to be dreaded; and yet this risk may be ventured in the far advanced states of phthisis, although whatever good effects may follow, either in this or in some other maladies can be viewed as temporary only.

436. *B.* Recently a "*compressed air-bath*" has been employed in France by MM. TABARIE (the inventor), BERTIN, and MILLIET, and introduced into this country by Dr. GRINDROD, for the cure of the several diseases of the respiratory passages, and for the first and second stages of phthisis. The patients, to the number of ten or twelve, are received into a circular saloon, fourteen or fifteen feet in height, and ten or eleven feet in diameter, made of sufficiently

thick iron plates, with windows of thick glass, and provided with all requisite appliances. The air is propelled from a healthy situation by means of a steam engine through pipes into the saloon. The duration of the bath is two hours; the condensation of the air is gradually increased to the maximum of pressure during the first half hour, and the patient remains exactly an hour under this maximum; in the last half hour of the two, the pressure of the air is slowly reduced to the ordinary amount. The degree of compression is about one half more than that of an ordinary atmosphere. M. TABARIE says that an increase of two fifths of an atmosphere gives better results than two thirds; and Dr. GRINDROD states that the increase of half an atmosphere (or $7\frac{1}{2}$ lbs. of pressure on the square inch—the ordinary pressure being 15 lbs.) is best adapted to attain the medical results of the bath. It is not desirable to administer this air bath soon after a full meal, or when the patient is fatigued. From thirty to forty baths are required for the treatment of the disease, and sometimes fifty.* I have briefly noticed this mode of treating diseases of the respiratory passages, but have had no opportunity of observing its effects. A somewhat similar method was suggested by Dr. HENSHAW as early as 1664, and much more recently by Dr. CARSON; but it was never practically adopted until the physicians above mentioned had recourse to it.

437. *C. INHALATION* of various fumes and vapours, chiefly medicated in various ways, and by diverse means, has been advised by many. — *a.* I have seen several modes of inhalation employed, and have prescribed certain of them, but without any very manifest benefit. The great disadvantage of most of these means is occasioned either by the amount of aqueous vapour thus passed into the lungs, or by the irritating or other effects produced in the air-passages by the ingredients employed. I have already noticed the subject of inhalation above (§§ 341, 348, 377), and when treating of *bronchitis* (see PART III. *On Bronchitis*); and the opinion I have stated under this latter head many years ago a further experience has fully confirmed. I may mention, however, that the inhalation of sulphuric æther, with the vapour from preparations of conium, was advised by Dr. PEARSON; of vapour containing the fumes of Burgundy pitch, by HOME; of aqueous exhalations from henbane, myrrh, and “*naphtha vitrioli*” (sulphuric æther), by JOERDENS; of the fumes from pine-tops, and various balsams, by a number of writers; and of tar-vapour, by CRICHTON and PAGENSTECKER. But

* *The Compressed Air-Bath: a Therapeutic Agent in various Affections of the Respiratory Organs and other Diseases.* By R. B. GRINDROD, M.D., &c., London, 12mo. 1858.

the usual modes of inhalation, especially those in which inhalers are employed, are most objectionable and much more injurious than beneficial.

438. *b. Weak fumigations* diffused through the apartment occupied by the patient are much more beneficial than any mode of inhalation; and the vapour, or the weak fumes, or rather the odours exhaled from the substances employed for the purpose of impregnating the air of the apartment, are sufficiently strong to be respired by the patient in most cases. The greatly diluted fumes or vapours proceeding from creasote, from tar, from turpentine or the several terebinthines, from pine-tops, from various balsams, from the æthers, especially pyroligneous æther or pyroxilic spirit, from cedar, and from resins, gums, &c., independently of any combination with aqueous or narcotic vapours, are generally much more beneficial and pleasant to the patient than the inhalations commonly employed. The embrocations so frequently recommended for this (§ 339) and several other diseases act beneficially, chiefly in consequence of the inhalation by the patient of the ingredients as they are evaporated, or as their dilute fumes are exhaled and diffused in the air surrounding him. A young man, who had repeatedly come under my observation in an advanced stage of phthisis, completely recovered his health after he had been for a considerable period employed in the manufacture of creasote. When cough is distressing, the fumes of æther, arising from the sprinkling of one or other of these, especially of the spiritus ætheris sulph. comp., the pyroligneous æther, or pyroxilic spirit, or the hydrochloric æther, or of chloroform, on the bed-clothes of the patient or on any article more or less removed from him, will often have a very palliative effect.

439. *iv. THE EXTERNAL MEANS* of treating phthisis have been already partly noticed (§§ 337—340).—*A.* Amongst these *medicated* and *mineral baths* have been advised by several writers, more especially the warm mineral springs of the Continent. But the mineral waters of Harrowgate are equally beneficial with the best of these for warm bathing in the early and in scrofulous states of the disease. Sulphuretted chalybeate baths were recommended by LENTIN; the baths of *Baden* were praised by SCHENCK; and those of *Weisbaden* by RITTER, especially for the early stages of phthisis. They are still more likely to be of service for the prevention of the disease, aided by more beneficial means; for very little dependence can be placed upon thermal springs or baths alone, either in the prevention or cure of this malady. Whatever benefit is derived in

some cases is to be imputed as much to change of air, exercise, and regimen, as to the effects of the baths.

440. *B. External derivatives and exutories* have been advised for phthisis from the earliest periods of medical history. I have stated above (§§ 337—340) the modes in which these may be employed and the general results of my experience of them. I shall only notice the opinions of a few writers respecting them: the views of many eminent authorities on this important department of medical practice may be gathered from the historical sketch I have given above (§§ 272 *et seq.*). During the course of my medical experience I have not observed this practice employed in the manner in which it is most efficacious. Tartar-emetic ointment; croton oil liniments, &c., have been frequently resorted to in recent times; but issues and setons have been rarely employed; although the experience of numerous writers, as well as my own experience in several cases, has demonstrated their great utility. The selection of a situation in which an issue may be made or a seton inserted is often the chief difficulty in the way of either. BARTHOLIN directed an issue to be made in the back, below the scapulæ; DUPLAN and RIVERIUS between the scapulæ; GEBEL, DREYSIG and BILLARD, in the upper arm; SIMMONS recommended a seton to be inserted in the nape of the neck; MONRO, PORTAL, and HILDENBRAND in the arm; ZACUTUS LUSITANUS at the edge of the pectoral muscle, near the axilla; WHYTT and RUSH preferred the same situation for a seton, or near the sternum for an issue, LENTIN also selecting these places in preference to others. Whilst these and many other authors have thus resorted to these means in phthisis, they have not considered them suitable to all states or stages of the malady. QUARIN, WINTRINGHAM and SOUVILLE, who have been less in favour of these means than the writers just referred to, consider them worse than useless in the far advanced course of the disease and when there is much exhaustion. Having often employed them with advantage—in some instances in the families of medical men of my acquaintance—I am enabled to state, that I have generally preferred issues, kept discharging by means of a number of peas, to setons; that, when the patient is not much emaciated, some part of the breast, or over the margins of the false ribs, has been preferred; that this practice is of service chiefly in early stages, before cavities are formed, and in the more usual and chronic forms, of the disease; that it is more especially beneficial in the hæmoptysic and congestive complications; and that it should not be resorted into the more febrile, debilitated, and emaciated cases, and when

the signs of cavities are manifest. It ought to be further recollected that time is a necessary element in the development of the effects of this treatment; that the other means of cure, the diet and the regimen adopted, should be restorative and nutritive, without being heating or stimulating, especially as the discharge from the issue or seton becomes copious; and that air and exercise in the open day, avoiding injurious exposure, should not be neglected.

441. *C. Blisters, rubefacients, and embrocations* (§§ 337—340) have been sufficiently noticed. The first of these, when kept discharging for some time or frequently renewed, is often of service, and may be substituted for issues or setons when these latter will not be adopted by the patient. The *embrocations* which I have so often mentioned are of service, both as irritants or rubefacients, and as furnishing the best means of inhalation. *Cauteries*, actual or potential, formerly employed, and recommended by HIPPOCRATES, GALEN, and others of the ancients, and by PORTAL, AULAGNIER, GARDOUIN, &c., among the moderns, are rarely prescribed; and even *moxas*, although much praised by LARREY and other recent writers, are seldom resorted to. *Urtication*, which was recommended by LANGE, is also superseded by other means. That pustular eruptions and purulent discharges artificially produced have more or less influence in delaying or arresting the progress of phthisis, when the disease is not far advanced, are amongst the most important facts in medical practice; but much more is required than an empirical recourse to such means. A knowledge of the cases, states and stages of the malady in which they are likely to be of service, or at least not to be detrimental, and of the other means, constitutional, local, external, and regimenal, which may be brought to their aid, is essential to success in the employment of them. That the production of a purulent discharge or the formation of a purulent eruption has sometimes cured phthisis, appears to have been known from the earliest periods of medical history. After the appearance of small-pox, it was observed that a copious eruption in that malady often cured pulmonary consumption in an early stage, and as often accelerated the progress of this latter disease in an advanced stage. This was remarked by MUYNIK, BRACHET, and others; and it has been stated by writers that phthisis is rarely observed in persons much marked with small-pox — a statement which has appeared to be confirmed by my own observation.

CHAP. XIX.

STATES OF THE AIR AND LOCALITIES ADVISED FOR CONSUMPTIVE PATIENTS.

442. I. STATES OF THE AIR were much discussed by writers from the middle of the last century until early in this, in respect of consumption, and all sorts of air were considered with reference to the cure of this disease. The air of cow-houses was advocated by some, of marshes by others (§ 320). Even the mephitic air produced by bilge-water (arising chiefly from the action of salt-water upon the ship's timbers) was considered by BEDDOES and HARRISON as the cause of the benefit derived from voyaging. The use of fixed air, soon after its discovery, in the treatment of phthisis, was most unprofitably discussed by writers from 1780 to the commencement of this century ; and although the influence of the carburetted and sulphuretted hydrogen, and other gases given off from bilge-water, may be considered by some as disposed of, yet it is still viewed as not without some favourable influence by those who believe in the good effects of marshy exhalations in threatened phthisis.

443. That fixed air contained in fluids is a useful palliative in this disease, and for the dyspeptic symptoms which accompany it, cannot be doubted ; and that the sulphuretted hydrogen contained in some mineral waters is often beneficial, as most preparations of sulphur are also more or less so, in tubercular states of the lungs, must be admitted, as far as medical observation and experience warrant the belief. But this refers only to the gases impregnating fluids taken into the stomach.

444. Of much greater importance is the determination of the questions, whether or no the air in very elevated situations, or in low places, and whether that near the sea, or at a distance from it, is the most beneficial to phthisical cases ? Or, in other words — 1st, What is the state or states of the air which the phthisical patient may breathe with greatest benefit ? 2nd, Should the states of the air, found beneficial in certain seasons, be continued in other seasons ? and 3rd, If change of such an air be found requisite, how should it be most appropriately and beneficially changed with the procession of the seasons ?

445. 1st. *Sea voyages* were praised by CELSUS, ARETEUS, and others amongst the ancients ; and by GRANT, SAVARY (*Lettres sur*

l'Egypte, t. iii. p. 8), and many among the moderns. But it is very doubtful what share of the benefit observed proceeds from the sea air itself, or from the motions and other circumstances connected with the voyage. It is not improbable that the sea air may contain certain elements beneficial to morbid states of the lungs, and sufficient to counteract any injurious influence which humidity alone might produce. But persons living on the sea-coast are not more exempt from phthisis than those living inland, where equally humid states of air, within the same ranges of temperature, usually exist. A greater exemption may be experienced, but the amount has not yet been ascertained, or even an approximation to it. The ancients inferred benefit from sea air, because the voyages for the cure of pulmonary diseases were generally made to Egypt, and very probably the relief manifested soon after the arrival of patients in that country was partly at least attributed to the voyage. Although Dr. SMYTH is not in favour of sea air for consumptive cases, yet I know that voyaging in the Mediterranean and in the Atlantic has been most beneficial in several cases in which I have advised it. But I agree with CÆLIUS AURELIANUS, GILCHRIST, BLANE, REID, and many others, in saying that in order to be of service it should be adopted early in the disease; if it be resorted to at a far advanced period, and if a very warm latitude be entered into, the disease will most probably be accelerated to a fatal issue. The opinion in favour of voyaging was strongly argued for by Dr. GREGORY in his Thesis *De Morbis Cœli Mutatione Medendis*, and has been very generally admitted; but the practical adoption of it should have due reference to the stage of the disease, to the temperature of the ocean, and to the caution just stated. Cruising in a temperate latitude, particularly in the Atlantic, is preferable to voyaging, because of its longer duration. Whilst the sun is north of the equator, the climate between the 35th and 55th degree of latitude, and while the sun is south of the equator, that from the 20th to the 35th or 40th will be found the most salutary. During winter voyages between Spain, Portugal, Madeira, and South America or the West Indies; and in summer, between Madeira and various parts of North America, the south of Europe, and this country, in the vessels usually passing between these countries, may be undertaken with advantage in an early stage of the disease, especially as these vessels now furnish excellent accommodations even for invalids.—(See also § 330.)

Whether in inland situations, or places on the sea-coast whose climates are physically alike, most serviceable in pulmonary con-

sumption; and whether or not sea voyages possess any advantage over a land residence in this disease? (*a.*) In respect of the first question, it may be stated that places on the sea-coast are generally more humid than those inland, and oftener, on this account considered preferable in dry and hæmorrhagic pulmonary affections, and in the early stages of phthisis: whilst an inland locality is believed to be more serviceable in those cases of consumption which are otherwise characterised. As general propositions, however, they admit of doubt, or there must be many exceptions to them, arising from the progress, conditions, and complications of the malady, and from the diathesis and temperaments of patients: still, in the majority of cases, I believe that, other things being equal, a preference should be given to an elevated, temperate, and dry atmosphere or locality over places on the sea-coast, which must necessarily be low, and more or less humid; and that dryness and elevation seem even more beneficial than the temperature, provided that it be neither too low, nor liable to sudden vicissitudes. This opinion appears to be confirmed by the observations of Dr. RICHARDSON respecting the climate of Nubia, of Dr. BARCLAY on the climate of Egypt, and of Dr. ARCHIBALD SMITH on the influence of high elevation in warm climates on consumption. In *Nubia*, *Egypt*, the South of *Spain*, and at a considerable elevation on the *Andes*, cases of this disease, whether attended by hæmoptysis or not, were remarkably benefited soon after their arrival; and a removal from the last-named place to the sea-coast was often followed by a return of the malady. From the testimony and experience of these eminent writers, and from what other sources of information have furnished, I infer that dry states of the atmosphere in moderate grades and ranges of temperature, and at considerable or even moderate elevations above the sea-level, are most favourable to consumptive patients; that the places just named, and Malaga, and various other places in Syria and the East, are most to be preferred; and that, before the commencement of the hot season, Nubia, Egypt, and other places, where the temperature rises very high, should be relinquished for others which are more temperate.—(See p. 219.)

446. The *second* and *third* questions are partly answered by what I have now stated; for although a continued residence in these climates may not be injurious to many consumptive patients, yet it may give rise to diseases of a different nature, or may occasion complications of phthisis which otherwise might not have occurred; or it may prove too exhausting, or otherwise injurious

to the patient: in many cases, if not in the majority, a change to a more temperate climate is therefore beneficial before the hot season commences; and if the change can be made to a climate both dry and temperate, it will generally prove of the greatest advantage. Patients who are subject to hæmoptysis, or other states of the more usual or chronic forms of phthisis, will derive very great benefit from a voyage to Alexandria, and a journey thence to Cairo and Upper Egypt, and, having resided there or in Nubia during the winter months, proceeding thence to Syria, they may return by the places favourably noticed in Italy or the South of France, or by Malaga, Granada, or other places in Andalusia, in April or May, to England: or, if it be preferred, a voyage may be made across the Atlantic early in September, with great benefit; and having crossed the isthmus of Panama, the Pacific may be traversed; and having visited Lima, a residence in the mountains of Peru may be tried at the elevation and in the season found most beneficial for phthisical patients. After a satisfactory residence in this locality, the patient may return to Europe by the same route as that by which he went out, or by one more direct, taking care, however, to return to England about May or June.* If this

* There are many places in the South of Spain that may be chosen for winter residences by persons either threatened by, or in the first stage of tubercular consumption, especially in Andalusia; and if the vicinity of Malaga, or of Granada, or of Seville be not selected, other places in the above extensive province may be tried. During the warmer months, the more elevated situations on the southern side, or the southern ridges of the Sierra Morena, furnish many situations which cannot fail of possessing most of the advantages required by phthisical invalids.

Dr. MITCHELL (*Brit. and For. Medico-Chirurg. Rev.* No. xxxiii. p. 226) states that "the climate of Algiers, during winter and spring, vies with that of Madeira,—being as warm and steady in temperature, but drier and more bracing."

It has been a generally received opinion among medical and scientific men that very high elevations above the level of the sea are injurious to tubercular consumption, especially when it is either ushered in, or attended by, or even threatened with hæmoptysis. Dr. ARCHIBALD SMITH's very interesting account of the very remarkable benefit he saw, in numerous cases (see above §§ 445), derived from residing at an elevation above the sea-level of 5000 to 10,000 feet, completely upsets this opinion. This very able and experienced physician has further remarked on this subject, in a communication he has kindly favoured me with since the preceding pages of this work were printed; and he has stated, respecting a diminished or increased frequency of phthisis in the aborigines of a country by change to a colder or to a warmer climate, or to a higher or lower elevation, "that as regards Lima and the coast of Peru generally, the change of the maritime climates of Chili and Ecuador—the first colder, the second warmer—has a decidedly bad effect on the Peruvian phthisical invalid; but the higher elevation on his own mountains of 5000 to 10,000 feet has a decidedly curative influence. In these regions the climate is moderately dry and temperate, favourable to exercise in the open air, and the patient is also removed from a luxurious and sensuous society, as well as from a warm, humid and relaxing atmosphere. Very possibly the decided

plan be followed out for two, or three, or four seasons, at an early stage, with due precautions against injurious exposure, the disease

benefit received by the natives of Peru from the change from coast to mountain may not be equally shared in by strangers. I hope, however, that this may be a fair trial, and, as you recommend navigating by Panama to the Pacific, that you will find room to recommend, on fair trial, to Europeans, the migration to elevated spots on the Andes, from time immemorial known of paramount importance to the native races affected with pulmonary consumption." Dr. ARCHIBALD SMITH's very long and extensive experience of the diseases in this part of the new world renders his opinion of the greatest value on this subject. He further remarks, "I observe what you state with respect to the effect of migration on the Chinese; and I can say that, among the thousands of this race lately introduced into Lima, I never met with an instance of phthisis. It is likely, however, that this disease will show itself in their offspring born in Peru, of Indian or dark women. When the Chinese crop their hair, and take on the Peruvian dress, it is not easy to distinguish them from native Peruvian Indians." Is not this last remark in favour of the opinion that the Indian races are offshoots from the Mongolian, or Chinese?

Dr. RICHARDSON, in his account of his travels in Egypt and Nubia, published more than thirty years ago, has strongly recommended these countries, and especially the latter, as winter and spring residences for phthisical invalids. The more recent evidences of my eminent friend the Rev. PRINCIPAL BARCLAY, fully confirms this recommendation.

"I may add," Dr. BARCLAY states, "that dyspepsia is very prevalent among the European residents in Alexandria; and I was informed that cases of pulmonary consumption, though not common, do occasionally occur among the natives of the whole northern seaboard of Egypt; but the inhabitants of Middle and Upper Egypt, as far as I could learn, are entirely exempted from that fatal disease. The prevailing maladies throughout all Egypt are dysentery and ophthalmia; both induced, it is believed, by exposure of the heated frame to currents of cold air.

"These observations on the subject of Egyptian climate would be very incomplete, if I failed to notice its influence in arresting hæmoptysis. Several instances of its efficacy in that respect were mentioned to me, and one very decided case fell under my own observation. A. B., a middle-aged gentleman, of a clear and florid complexion, had been for years afflicted with this complaint to an alarming extent. He had spent a winter in Italy without experiencing the smallest mitigation of his ailment. He had next been sent to Madeira, and there the malady was very greatly aggravated. He was at Malta when I went to Egypt; but, finding no relief there, he came to Cairo in the end of December, and took up his abode at the hotel at which I lodged. The effect of the change of climate was immediate. The spitting of blood ceased at once, nor did it ever recur during his stay at Cairo, which was prolonged till the end of April. He then went to the South of Spain, and remained there till the month of June, when he returned to England, apparently in perfect health, and fully resolved to spend the whole of the following winter in Egypt with the view of confirming his cure.

"The transition from the climate of Egypt to that of Britain is too violent to be hazarded by one whose respiratory organs are in a delicate or dubious condition, especially as the season at which it is necessary to quit the one country is far from being genial in the other. I therefore stopped in Spain on my homeward passage, and spent the latter part of May and the greater part of June in that country and in Portugal. Having heard that the air of Malaga was remarkable for its mildness, I repaired thither, and was both delighted and surprised to find in Europe, a climate scarcely inferior in any respect to that of the latitude of Cairo. The register I kept while there, shows a temperature which was probably only a few degrees lower than that of

will either be arrested for some years, or altogether overcome, in a great many cases, and indeed in most, if not delayed to a too far advanced stage.

447. II. OF OTHER LOCALITIES WHICH ARE BENEFICIAL FOR CONSUMPTION.—In this part of the subject, I shall consider, *first*, the different parts of Great Britain which may be suitable places of winter and spring residence for consumptive invalids; *secondly*, those in the south of Europe and the Mediterranean; and *thirdly*, those in the Atlantic, West Indies, &c.

448. i. *Climate of certain places in England*.—The chief difficulty in this country is to find, in winter and spring, a mild and sheltered climate for invalids from pulmonary disease; and it is chiefly in the south and south-west parts of the island, where we must direct our inquiries. The general use of coal fires in all the large towns in Great Britain, owing to the quantity of sulphur this mineral contains, and of sulphurous acid fumes, and fuliginous matter generated, renders the air more irritating to the lungs, and increases the risk of a winter residence in these places, to all those who suffer from, or are even liable to, diseases of the respiratory organs. This, together with other considerations—especially the results of observation—renders it imperative on the medical attendant to recommend removal to a more salubrious locality. The mild situations I shall notice are in the south, the south-west, and the west of the island.

449. A. The *south coast* is much milder and more moist than the east and inland parts of the island, during the months of November, December, January, February, and March; but from April to October the temperature of the latter is greater. On this part of

Cairo at the same date, while its equability was greater than I had noted anywhere except at Alexandria; and what is still more remarkable, the dryness of its atmosphere exceeds that of Cairo, and contrasts surprisingly with the humidity with which the air of Alexandria is loaded.

“The atmospheric conditions are doubtless to be referred, partly to the geological structure and the physical conformation of the country round Malaga, and partly to the latitude in which it is situated. I am persuaded that, in a therapeutic point of view, the climate in this part of Andalusia is deserving of more attention than it seems hitherto to have received. Those who take it for granted that the climate of Italy must be the mildest and warmest in Europe, seem to forget that Malaga is 248 miles farther south than Naples, 318 miles farther south than Rome, and 518 miles farther south than Venice; and those who have not adverted to the fact will probably be surprised to find that it is 5 miles farther south than Algiers. Both Gibraltar and Cadiz are somewhat south of Malaga, but both have a great diurnal range of temperature, and are nearly equal to Alexandria in the humidity of their atmosphere; the one standing on an almost insulated rock on the Mediterranean Sea, and the other on a narrow spur of land projecting into the Atlantic Ocean.”

the coast, *Undercliffe*, in the Isle of Wight, *Hastings*, and *Brighton* have been recommended as winter residences for invalids. *a. Undercliffe* is the most sheltered and mild of these places in winter and its air softer and more humid in summer than either. *b. Hastings* is sheltered, during the winter and spring months, from the north and north-east winds; and of the various places on this part of the coast, ranks next to *Undercliffe* as a residence for invalids with pulmonary affections. *c. Brighton* is more exposed than the foregoing to the north and north-east winds, and its air is drier, and hence more bracing. It is therefore more suitable than they to the nervous, the simply debilitated and relaxed, to the dyspeptic, to those affected with chronic bronchitis and asthma, attended by greatly increased secretion. Sir J. CLARK suggests that invalids who select the south coast as their winter residence, should pass the autumn at Brighton, and the winter at Hastings, the climate of the former being mild to the end of December; but it should be recollected that the situation of these on the sea coast, and their consequent humidity, render them of only partial service, and even unsuitable in some cases.

450. *B.* The south-west coast of the island is very mild in several situations during the winter, and has, therefore, been very generally recommended in diseases of the respiratory organs. Sir J. CLARK estimates the temperature of its more sheltered localities as being 5° higher than that of London, during the winter months; and the temperature of the south coast as only 2° higher. But I conceive that there are, at least, 6° and 3° respectively of distance between these and London and its vicinity. Besides, it is not only the range of temperature that should be considered, but its greater equality and less rapid vicissitudes and the increased humidity, and more soothing influence of the air.—*a.* The places on the coast of Devonshire most in repute as residences for the consumptive, are *Torquay*, *Dawlish*, *Sidmouth*, *Exmouth*, and *Salcombe*. Of these *Torquay* is the best; and, according to the reports of Sir J. CLARK Dr. FOOTE, and of my late relative Dr. W. HUTCHINSON, who resided in it, superior to all other places in our island in pulmonary cases.

451. *b. Penzance* is the principal place in Cornwall recommended for invalids. Its peninsular situation and south-west position, give it a remarkably soft, humid, and mild atmosphere; and the equality of its temperature, not only throughout the year, but also during the day and night, renders its climate in many respects superior to that of most places in the south of Europe, and brings

it next to Madeira. The quantity of rain that falls annually at Penzance is nearly double that which falls in London; the number of rainy days is much greater; and the temperature of the air at night at least 7° higher during the winter months. This mildness, equality, and humidity of climate is, however, somewhat impaired by its exposed situation, and its liability to high winds.

Both the Land's End and the coast of Devonshire, owing to the predominating character of softness, humidity, and equality of climate, exert, along with a soothing, an evidently relaxing effect. Hence this coast is best suited to the irritable and inflammatory states of disorders of the respiratory organs, and such as are characterised by irritation, but little expectoration, and dryness of skin. In cases attended with a copious expectoration, great relaxation of the mucous surfaces and soft solids, and in nervous debilitated persons, this climate will prove injurious. Even in those cases where it seems to be indicated, and actually proves of service, removal will be necessary to a somewhat drier air during the summer; and this should not be deferred longer than June or undertaken before April or May; the patient often deriving much benefit by returning the succeeding winter. The observations now made upon the climate of the south-west coast apply to that of *Jersey* and *Guernsey*, to which islands invalids sometimes repair, and occasionally with advantage. South-west winds generally prevail in them during autumn and winter, and cold north-east winds often continue long in the spring. The summer climate of these isles is excellent. Of the two, that of Jersey is preferable.

452. *C. The West of England.* — The mean temperature of this part of the island is a little lower than the southern coast, but in March and April it rises somewhat above it. Bath and Bristol are about 3° warmer than London during the months of November and December; but this difference is reduced more than one half during January, February, and March. In this part of the country the vale of Bristol is the most sheltered and mildest. The climate during the winter is rendered more mild by the vicinity of the ocean, whilst the groups of surrounding mountains attract the clouds and diminish the fall of rain below the current to which its western position would otherwise subject it. Bristol Hot-wells, and the lower parts of Clifton, are the most sheltered spots, and the best suited to consumptive patients; whilst other invalids will find most advantage in the more elevated situations which the latter presents. In general, the climate of this place is perhaps

the mildest and driest in the west of England; and, therefore, one of the best winter residences, for invalids. It is drier and more bracing than that of the south-west coast, and therefore not so well suited to those affected by irritative and inflammatory action in the respiratory passages and bronchi. For these, the more soft and humid air of Torquay and Penzance is preferable; but, with the return of summer, the consumptive invalid will relinquish the latter for the former with benefit. Clifton and Bath are certainly preferable places of residence to the south-west coast, in cases of protracted dyspepsia, gout, scrofula, and chronic bronchitis, particularly the last occurring in young persons, and relaxed habits. In these affections, the waters of *Bristol Hot-well* will, with regular exercise on horseback or on foot, prove extremely beneficial.

453. *D.* The more *Inland districts* of England furnish various places which are salutary to invalids during the summer. *Harrowgate*, and the surrounding country, with its waters, are very serviceable in scrofulous, consumptive, and dyspeptic cases; and, for consumptive and other invalids, various places in Wales, as Abergavenny, Aberystwith, Tenby, Barmouth, &c., will be visited during the season with advantage. Where a course of goats' whey may be considered of advantage, a summer residence in Wales will be preferred. There are various other places which, besides their mineral waters, furnish excellent summer residences for the invalid. Buxton, Matlock, Leamington, Cheltenham, Tunbridge Wells, &c., independently of the use of their respective mineral waters, prove excellent places of residence for those who are debilitated or exhausted, whose respiratory and mucous surfaces are relaxed, or whose digestive, secreting and assimilating functions are imperfectly performed, and any of the abdominal viscera congested or obstructed. In these latter circumstances of disease, especially, the appropriate use of the waters of those places, assisted by regular horseback or walking exercise, by suitable medical treatment, and by mental relaxation and amusement, will often prove of great service. In prescribing the mineral waters of any of those places, due reference should be had to the nature of the climate; and, on the other hand, when directing change of climate, some attention should be paid to the waters which the place may afford; as the appropriate use of the one, whilst the patient is experiencing the influence of the other, will materially promote the end in view.

In a very great proportion of cases, where the state of the

patient admits of change of locality, much advantage will accrue from passing the autumn on the south coast of the island, as at Brighton, Hastings, or Undercliffe, after having passed the summer at the foregoing watering-places. In general when the respiratory and digestive organs are disordered, frequent change of air, and travelling by easy and short journeys, with gentle exercise, particularly on horseback, agreeable amusement, and regular habits, will prove of marked advantage, and greatly aid medical treatment.

454. ii. *Of the climate of certain parts in France.*—A. The West and South-west of France furnish several places the climate of which is recommended in pulmonary diseases. The mean annual temperature of the south-west of France is stated by Sir J. CLARK to be 4° higher than that of the south-west of England; and the climate of both generally agrees or disagrees with the same diseases. — a. That of the south coast of Brittany is mild during the winter, and temperate in summer, the mean temperature of this province being about $56\frac{1}{2}^{\circ}$. Its climate is soft and relaxing; and it is hence suited to dry bronchial irritations, to hæmoptysis and tubercular cases. LAENNEC found it very favourable to consumptive patients, and he states that the proportion of such in this part of France is very small. In scaly eruptions of the skin, dysmenorrhœa, and in irritable habits of body, this climate is also of service.

455. b. *Pau*, situated at the base of the Pyrenees, appears to be the best place in the south-west of France for consumptive cases. Its air is still and mild in winter and spring; the chief advantage it offers being the great mildness of its spring. Sir J. CLARK gives the following comparison: — its *mean annual* temperature is $4\frac{1}{2}^{\circ}$ higher than that of London, and about 3° higher than that of Penzance; it is about 5° lower than that of Marseilles, Nice, and Rome; and 10° lower than that of Madeira. In *winter*, it is 2° warmer than London, 3° colder than Penzance, 6° colder than Nice or Rome; and 18° colder than Madeira. But in the *spring* Pau is 6° warmer than London, and 5° warmer than Penzance; only $2\frac{1}{2}^{\circ}$ colder than Marseilles and Rome, and 7° colder than Madeira. The range of temperature between the warmest and coldest months at Pau is 32° ; this at London and likewise at Rome is 26° ; at Penzance it is only 18° , and at Madeira 14° . The daily range of temperature at Pau is $7\frac{1}{2}^{\circ}$; at Penzance it is $6\frac{1}{2}^{\circ}$; at Nice, $8\frac{1}{2}^{\circ}$, and at Rome 11° . Pau, is drier and warmer than the south part of England in the spring, and northerly winds are less injurious. One of its chief advantages is its vicinity to the

watering-places among the higher Pyrenees, which are often beneficial places of summer residence to those who have passed the winter and spring at Pau.

456. *B. The South-east of France.*—The climate of the tract of country extending along the shores of the Mediterranean, from Narbonne and Montpellier to the Var, is warmer and drier, but more exciting than that of the south-west. It is subject to sudden vicissitudes of temperature and to cold winds, especially the north-west, or *Mistral*. It is decidedly prejudicial to consumptive patients, especially when the disease has made some progress, and to irritative affections of the stomach, trachea, or larynx, and is serviceable chiefly in diseases of debility and relaxation unattended by inflammatory or hæmorrhagic action.

The principal places on the coast of Provence may be ranked in the following order, as residences for invalids:—Hyères, Toulon, Marseilles, Aix, Nismes, Avignon. — *a. Hyères* and *Cannes* possess the mildest climate on this part of the coast, being sheltered from the north winds by a range of hills; and their inhabitants being comparatively exempt from pulmonary affections. *b. At Marseilles* the climate is dry, variable and subject to cold irritating winds. It is therefore injurious to consumptive patients; and is one of the places in France where pulmonary diseases are most prevalent. Invalids requiring a dry air and capable of bearing cold winds may be benefited by residing here for some time. *c. Montpellier* has obtained a reputation for salubrity to which it has no claims. According to MM. FOURNIER and MURAT, more than a third of the deaths that occur in the hospital of this city are from pulmonary consumption. The prevalence in this part of the country of northerly winds during winter and spring, both accounts for the frequency of pulmonary diseases and points out its unfitness as a residence for patients thus affected. *d. Aix* is still more exposed than Montpellier to the *Mistral* and north winds, and pulmonary complaints are very prevalent among its inhabitants.

457. *C. Nice*, although situate on the same line of coast of Provence, enjoys a much milder climate than any part of that province. It is protected by a lofty range of mountains from the north winds; and the daily range of temperature is there less than at almost any part of the south of Europe. During winter the weather is settled, and the atmosphere clear, the thermometer seldom sinking to the freezing point, excepting at night. At this season, however, as well as in the spring, cold dry winds are not infrequent; and the climate is, upon the whole, dry and

exciting. Hence it is not favourable to pulmonary consumption, the very disease for which it was formerly very improperly recommended. It is likewise unfavourable to irritable or inflammatory states of the larynx, trachea, and bronchi, attended with scanty expectoration, or hæmoptysis. But chronic bronchitis, bronchorrhœa, and humoral asthma, are generally very much benefited by the climate of Nice. It is also serviceable in all cases of debility, torpor, and relaxation of the mucous surfaces; in chronic rheumatism, gout, external scrofula, dyspepsia, and hypochondriasis.

Mentone, near Nice, has, however, been recently much resorted to by phthisical patients. Dr. HENRY BENNET resided in this town during the winter and spring of 1859 and 60—for six months remarkable for the severity of the season throughout Europe. He states that during these six months he never saw at Mentone “a fog day or night, morning or evening. Generally speaking, the sky was clear, and the sun shining in the heavens like a globe of fire. So powerful were its rays, that even in December or January it was disagreeable to walk in it without a lined parasol or umbrella. Owing to the power of the sun, the freedom from fog, the slight amount of rain, and the dry, rocky character of the soil, the air was usually very dry; so much so, that a wet towel would dry in the open air, out of the sun, within an hour or so, at any time in the winter, except when it rained or the sky was obscure. And yet it was winter at Mentone.

“Most of the English visitors were suffering from pulmonary consumption. The results of their winter’s residence were such as might be expected from the above details. Those who were in the early or even secondary stages of the disease, and had vitality and constitutional stamina left, mostly did well. I saw in several young females well marked crude tubercular deposits disappear, gradually absorbed. In several cases of accidental phthisis in middle-aged, over-worked men, the amelioration was still more apparent. Well-marked cavities became partly or entirely cicatrised, and the constitutional symptoms gradually subsided, the general health and strength steadily improving. Those who were in the latter stages of the disease, on the contrary, appeared to derive but little benefit from the change. The disease seemed to progress slowly, but steadily. They suffered from the cold and the wind, and especially from the occasional outbreaks of wet, chilly weather. Moreover, they felt bitterly the absence of home comforts, and their separation from friends. Several dropped off in the course of the winter, as they would have done at home, from hæmorrhage, from pleurisy, from

bronchitis, or diarrhœa. In their case, it appeared to me that little was gained by the change of climate. They could not avail themselves of its bracing capabilities for out-door life and enjoyment, and felt the variations, against which they could not protect themselves as well as at home. Such patients, I should say, are better at home, or in a warmer climate than that of Mentone, or Italy generally — Madeira, for instance, where the temperature is said never to fall below 56°.

“Several patients who always suffered from bronchitis in England, were quite free from it at Mentone, owing probably to the dryness of the atmosphere.”

I had the pleasure of seeing Dr. BENNET on his return from Mentone, and he then had the appearance of sound health.

The advantage of *dryness* of atmosphere here remarked by Dr. H. BENNET, agrees with my own experience of the benefit produced by it both in tubercular consumption and in chronic bronchitis. And, therefore, as I have repeatedly remarked, it is a dry, rather than a humid atmosphere which we should endeavour to recommend, the humidity of the air being the chief circumstance detracting from the reputation which places on the sea-coast have obtained, the dryness of inland and elevated localities being a chief advantage of these latter, more especially when conjoined with moderation in the vicissitudes and extremes of temperature. It is chiefly to the dryness of the climates of the Western States of America and of Canada, and of the Northern and Eastern countries of Europe, that phthisis is less prevalent there, than near the sea-coast, notwithstanding the advantage of a milder temperature possessed by the latter, humidity being the counteracting influence.

458. iii. *Of the Climate of Italy and the Mediterranean.*—A. Genoa is not favourably noticed by Sir J. CLARK as a residence for consumptive invalids; but Dr. JOHNSON on the authority of Dr. MOJON, speaks of it in more favourable terms. It is best suited to those affected by chronic bronchitis, and dyspeptic and gouty complaints; and to persons of relaxed and phlegmatic habits of body. Pisa and Rome, are the other places in Italy most frequented by phthisical persons. The climate of Pisa nearly resembles that of Rome, the latter being somewhat warmer and drier in winter. Sir J. CLARK considers the climate of Rome as one of the best in Italy for consumption, unattended by hæmoptysis. For those, however, who cannot take exercise in the open air, and must confine themselves to sheltered situations, the Lung Arno, in Pisa, is the best place of residence to be found in Italy. The climate of Naples is

considered by this writer, as well as by M. LASNYER, more exciting than that of the two foregoing places; and it is more subject to high winds. The diseases which a residence in either of these three cities will benefit, are those above enumerated. Persons who remain in Italy during the summer, will find Lucca, Sienna, and the vicinity of Naples, the coolest situations.

459. *D.* There are various other places on the shores and islands of the Mediterranean, the climates of which are suitable to invalids; but we possess little or no accurate information respecting them. *Malaga* in the south of Spain, *Cagliari* in Sardinia, and some parts on the coast of Sicily, afford a mild winter climate, but the difficulty of reaching them, and of obtaining in them many necessary comforts and conveniences, almost precludes invalids from the northern parts of Europe from visiting them. *Malta* is not open to these objections; but, according to Dr. HENNEN, the quantity of dust raised from its arid soil, and suspended in the air, during dry weather, renders it an unsuitable climate for consumptive patients. A considerable number, also, of the inhabitants die of pulmonary diseases. In his work on the medical topography of the islands of the Mediterranean, Dr. HENNEN states a fact, which is perfectly in accordance with my observation in warm climates, although doubted by Dr. CLARK, viz. that those of the *Ionian islands*, which are decidedly most malarious and remarkable for remittents, have had fewest pulmonary affections amongst the British troops. In respect of the health of the troops stationed in these islands, this writer states, that, from an average of seven years, phthisis has borne a proportion to other complaints of 1 to 198 $\frac{1}{4}$ only. At *Malta*, on an average of eight years, consumption has occurred in the proportion to other maladies of 1 to 93 $\frac{1}{2}$. Including all pulmonary complaints whatever, the proportion to others, as regards the Ionian Isles, has been 1 to 20 $\frac{3}{4}$; and, as respects *Malta*, 1 to 14. Taking into calculation the whole Mediterranean islands, the proportion of pulmonary, to other diseases, has been 1 to 17 $\frac{1}{4}$ in the British army.

460. *iv. Climate of the Northern Atlantic.*—Under this head the climates of *Lisbon*, *Cadiz*, *Madeira*, the *Canaries*, the *Azores*, *Bermudas* and the *Bahamas*, may be arranged; all of which have been recommended to persons requiring a soft and equable climate, during the winter and spring.

461. *A. Madeira* has been long considered the best of those places, as respects both the climate and the comforts and conveniences within the reach of the invalid. The frequency and excellency,

also, of the means of conveyance to and from the island are no small recommendations. From the minute account furnished of the climate of this island, by Drs. GOURLAY, HEINEKEN, and RENTON, after a long residence in it, and from the effects I have observed in several persons who have resorted to it as a winter's residence, it may be justly concluded, that it is superior to any part of the south of Europe for consumptive cases. Its central ridge of mountains gives it, in summer, a cool land wind; and the north trade winds, at this season, render it temperate and salubrious. During winter and spring, Funchal, and parts near the sea-shore, are the best places of residence; and during summer the more elevated situations in the interior are cool and agreeable. The mean annual temperature of Madeira is about 6° higher than the south-east of France and Italy; and the heat throughout the year is much more equably distributed. The winter of the former is 12° warmer than that of the latter, and the summer 5° cooler. At Madeira the extreme annual range is only 14° , whilst it is double this amount at Pisa, Rome, and Naples. In respect also of the progression and steadiness of its temperature, it excels those places. Rain falls at Madeira on 73 days of the year, and at Rome on 117 days, and chiefly during the autumn in the former. The air is also more soft than at Rome.

462. *B.* The *Canaries* possess the next best climate to Madeira. The mean annual temperature, however, of Santa Cruz, the capital of the former, is 71° ; whilst that of Funchal, the capital of the latter, is only 65° . The summer temperature of Santa Cruz is 7° warmer than that of Funchal, and the winter temperature 5° warmer. Hence the mean annual range of temperature is greater in the *Canaries* than in Madeira; which possesses, in other respects, advantages sufficient to recommend it in preference to the former in pulmonary diseases.

463. *C.* The *Western Islands*, or *Azores*, enjoy a climate nearly approaching to that of Madeira. They are, however, more subject to high raw winds, particularly those from the north and north-west, which are often very cold and harsh; and the temperature of winter is lower, and that of summer higher than in Madeira. The air is also more humid. From a very short visit I made to Madeira and the *Azores*,—to the former in the spring, and to the latter in winter,—I should conclude the *Azores* to be much inferior to Madeira as a residence for invalids, chiefly because of the absence of many necessary comforts and conveniences, of their stormy winters, and the infrequency and ineli-

gibility of the opportunities of transport between them and this country.

The climate of the *Bermudas* and *Bahamas* presents no advantages sufficient to obtain for them a preference to those already noticed. They are liable to storms, and to harsh northerly winds in winter from the American coast, whilst their summers are very hot.

464. v. *Climate of the West Indies*. — The mean annual temperature of the West Indies, at the level of the sea, is 79° , 80° , and 81° , and during the winter months, in some places, about 5° , and in others only 3° lower. The extreme annual range is 20° , and the mean daily range about 6° . This continued high temperature exhausts the vital force of invalids, and the clearness of the skies and the power of the sun prevent suitable exercise in the open air. A visit to the West Indies of a few months' duration, made either to some of the most healthy islands, or passed chiefly in elevated localities, or partly on board ship, will however prove of service in the early stages of phthisis, for hæmoptysis and chronic bronchitis. But to this climate, even more than to any other, a removal late in pulmonary disease will only hasten a fatal issue; and the same remark equally applies to removal to any warm climate, more especially to an intertropical one, when phthisis is far advanced.*

* My friend, Dr. WEBSTER, of Brook Street, who has visited and made himself acquainted with the several localities in Europe usually recommended to consumptive persons during the winter and spring, has very kindly responded to my desire to have the advantage of his opinion respecting them, in the following communication:—

"In answer to your questions respecting several localities in southern Europe, often said to possess advantages as winter residences for phthisical persons, I would briefly reply that, having visited most of them during various holiday tours on the continent, made with the view, among other objects, of ascertaining whether places frequently much lauded, really deserve the encomiums they receive, I have found that these statements are, in many instances, popular exaggerations.

"For example, at *Valentia* in Spain, sometimes of late highly eulogised, the air being characterised by unusual dryness, aggravated by land-winds, patients suffering from irritating bronchial coughs seldom derive any benefit; while lung-diseases are also very common among its population. *Malaga* is equally objectionable; being very dirty, and its streets so confined that respiration of pure air is scarcely obtainable, unless at villas in the vicinity, which are hence best adapted for consumptive invalids. Still, according to all the information I obtained, this city does not verify the reputation it has of late acquired as a winter sojourn in pulmonary maladies.

"*Pau*, in the south of France, is much preferable to either of these cities. Nevertheless, it has some objectionable features. Rapid variations of atmosphere are not uncommon, although within certain limits. The Pyrenean winds feel sometimes very chilly; while at other periods, the weather produces exceedingly depressing sensations; so that physical exertion then becomes distasteful, if not prejudicial. *Montpellier* appears to have totally lost its ancient high repute, whereby no one now thinks of selecting that spot as their dwelling, if affected by pectoral diseases; especially, as the north wind is here often very violent, as also injurious, during winter and spring.

465. v. The residence which may be recommended for the consumptive patient, whose circumstances cannot admit of a removal from, or at least any considerable distance from the metropolis, is often a matter of great importance. Those whose means and other circumstances admit of removal to the places above named will generally be more or less benefited by the removal, if the locality recom-

Nice, again, experiences so great alterations of temperature through northerly blasts, and likewise east winds, which often reign in spring, even when hot sunshine prevails, that, observers state, residents become thereby placed as if between an oven and an ice-house. *Cannes* and the town of *Hyères* are far more desirable. Indeed, the latter, in reference to climate, seems the best in France for consumptive victims.

"On the other hand, *Genoa*, being subject to frequent and rapid changes of temperature, from very cold north and east winds, which are often tempestuous, alternating with warm humid southernly breezes, its climate is consequently bad for pulmonary complaints. *Florence* even acts more unfavourably on such invalids; since here sudden transitions of atmospheric temperature prevail, while chilly piercing wind-gusts are common during winter and summer. Besides which, phthisis is very rife among its inhabitants. *Pisa* is, however, much more genial; particularly if parties reside in the locality designated "*Lungo Arno*," which offers advantages over every other place throughout Italy, and hence constitutes it as an excellent retreat for those labouring under thoracic maladies, should such sufferers visit that peninsula.

"The climate of *Rome*, although usually mild during winter, often becomes relaxing and oppressive; but appears nevertheless next best to *Pisa*. It is, however, otherwise insalubrious, from the prevalence of typhous fevers and intermittents, especially in warm weather. Finally, *Naples* proves very inimical to tuberculous affections. Consequently, individuals liable to these maladies ought to eschew this district. Deaths from phthisis are there more numerous than anywhere else in Italy. Its climate exhibits rapid changes from dryness to humidity, as also from cold to heat, besides which, sharp, chilly, and irritating winds frequently prevail during spring, the temperature being very changeable at that period; while the '*sirocco*' is also often severe. Altogether, *Naples* seems a very unsalutary Italian retreat for cases of consumption. The eye may be there pleased, and the physical sensations often gratified; but as a good sanitarium for phthisis, this city cannot be recommended.

"According to these remarks, you will easily perceive that, my opinions are not favourable to many southern European climates, although praised for consumptive invalids. Nay, I would further add, some situations in our own country are better adapted for such persons than most of the localities now mentioned. Excepting *Hyères*, *Pisa*, and in some respects *Pau*, several British towns or districts are actually superior; to say nothing of deficient domestic comforts and other essential appliances generally unobtainable in ordinary continental habitations. In England *Torquay*, although it often feels rather humid, as also relaxing to individual constitutions, and *Dawlish* likewise, on the Devonshire coast, are in numerous characteristics better adapted for phthisical patients as winter residences, if compared with various foreign districts here passed under notice. But it is especially in reference to the southern coast of Ireland, that I would ascribe a decided superiority. *Ross*, in the county of Cork, and still more *Queenstown*, formerly the Cove of Cork, possess advantages in regard to climate as winter residences for consumptive invalids, particularly the latter situation, which would make me prefer it to any other spot throughout the British dominions.

"Having consulted competent authorities fully able to judge regarding the places thus cursorily described, I trust my present observations may not be deemed wholly irrelevant to your inquiry, &c."

mended, for either a winter or a summer residence, be such as is appropriate to the state of the patient and to the stage of the disease, especially its early stage. In the immense population of London and its vicinity there are numerous phthisical patients who are unable, from various causes, to remove from their houses, or to transfer their homes to a distance from the metropolis. Many of these will find, that a choice of residence, more or less constant, with all the comforts arising from connections, family ties and social relations, may be made in the close vicinity of London, not much, if at all, inferior to the most of the localities already noticed. Somewhat of the benefit derived from change to several of these may be attributed to the change merely, and to the mental or moral influences which such change imparts. Much, however, of the benefit is of short duration, and further change is requisite, otherwise the patient becomes more rapidly worse than before any change whatever was made. But it is very difficult to select a residence in the close, or even most distant vicinity of London. Believing, however, that an inland situation, *cæteris paribus*, is preferable to a sea-coast locality, and that many of those situated on the sea-coast in the south of Europe or elsewhere have received a higher reputation than they deserve for benefiting consumptive cases, I have long entertained the opinion that several places in the outskirts, and in the vicinity of the metropolis, may be selected with equal advantages to many of those now passed in review. Many consumptive persons have come under my notice, either in consultation or for more prolonged periods, who have visited various places in Italy, the south of France, and on the south-west sea-coast of England, and have considered themselves to have passed the winter and spring as beneficially in the vicinity of London, or even more so than in those localities. Phthisical invalids in the far advanced stage were certainly better in London and its vicinity than in most of the places mentioned above. Several persons, of both sexes, in whom the disease had made more or less progress, in some even into the third stage, and who had never passed the circuit of the metropolis during the winter and spring months, are nevertheless now alive after many years of more or less ailment, and yet are able either to follow their daily avocations, or to enjoy the comforts of life and the society of their friends. The places in the immediate vicinity of London which have seemed to me most suitable to tubercular cases in winter and autumn are Knightsbridge, Brompton, Pimlico, Chelsea, Kensington, and various other places to the westward and south-westward. But either of these, or various other situations,

will suggest themselves to the physician, according to the peculiarities of individual cases and the season of the year. The celebrated Sir HANS SLOANE, the founder of the British Museum and president of the Royal College of Physicians and of the Royal Society, was subject to phthisis and attacks of hæmoptysis, went for a short time to Jamaica, and afterwards resided chiefly in Chelsea, and yet reached the age of 92 years. My late friend, Dr. A. H——, an eminent physician in Leeds, came many years ago to London to be under my care. After residing some time in Brompton, he visited several places in the south and south-west coast of England, and having resided some time in those on the south-west coast, he subsequently chose the south-west and west vicinity of London, varying his residence with the season, and believed himself better there than on the sea-coast. I could adduce other instances, but the opinion stands not in need of the iteration of evidence, for, although cases of a quite contrary result may be adduced, the fact cannot be denied as respects the question at issue, for the results entirely depend upon the state, forms, and complications of the malady for which these different localities are recommended, an appropriate recourse to either of these places, according to the peculiarities of individual cases, constituting the remedy.

466. *Phthisical invalids may return* from any of the *foreign* places noticed above to this country in May or June; or earlier in the spring if from Egypt, Italy, or other places having an early high range of temperature; and may pass through France or Switzerland, or through the south of Spain or Portugal, avoiding exposure to the evening and morning air. During the journey or voyage, warm clothing should be resorted to as soon as the temperature falls so low as to become sensibly cold, and a free circulation in the skin and extremities ought to be carefully preserved. During a residence in a warm winter climate, and in all places and in all circumstances, fine Welsh flannel should be constantly worn nearest the skin, and it ought not to be put off either night or day.

There are numerous places which may be selected by phthisical invalids for residence during summer and autumn — various situations in the vicinity of London, or in the midland or northern counties, either on or near the sea-coast, or in elevated or inland localities; several watering-places, as Harrowgate, Moffat, the Bridge of Allan, Tunbridge Wells, Leamington, &c., according as observation has indicated the selection to the patient or his physician, or as the comforts of home and family connections may influence the choice.

CHAP. XX.

THE DIET AND REGIMEN FOR CONSUMPTIVE PATIENTS.

467. i. THE DIET in phthisis has been already discussed in general terms, and chiefly with respect to my own experience (§§ 324—326), but a few authorities and particulars may be further adduced at this place.—*a.* HIPPOCRATES advised, for phthisis, *animal food* to be taken in small quantity, and often, when fever is absent and the opinion has been followed by SALVADORI, MAY, RUSH, VOGEL, ROLLO, and KINGLAKE. Animal fats, marrow, and fat meats were recommended by LANGE and BERTIN. The circumstances in which these may be adopted have been stated above (§ 325).

468. *b.* A *fish diet* is often of service, especially in the more chronic and hæmorrhagic states, or when the biliary organs are congested; but on all occasions the white kinds of fish should be selected, and always be boiled. The kinds of fish mentioned above (§§ 325, 351), should be preferred, their livers being also taken with them. Oysters were praised by TULPIUS and SIMS, but they ought to be taken immediately upon being opened, and a small number only at one time. I have very often recommended them, as well as lobsters, and some other kinds of shell-fish.

469. *c.* *Vegetable food* has been advised by many writers in preference to any other, whilst as many recommend a due proportion of animal and vegetable diet. Of the more unusual articles, at least in this climate, new figs, dates, the nuts yielding the palm oil, olives, &c., are the most likely to be of service. Grapes, both recent and dried, were praised by RIVERIUS; pickled red-cabbage by LANGE, and cucumbers with vinegar and sugar, by SCHMALZ, FRIZE, QUARIN, MARX; but these last should be thus dressed without having had their outer rinds removed. Of oranges, lemons, limes, &c., the utility is manifest.

470. *d.* *Milk* has always received great commendation in phthisis, but writers have differed respecting that which is most beneficial. Thus ZACUTUS LUSITANUS and BLEGNY prefer human milk; ARETEUS, BURSERIUS, and STOLL, asses' milk; DIEMERBROECK and VELSCHIUS, goats' milk; SCHENCK, either asses' or goats' milk; HIPPOCRATES, either mares' or asses' milk; and HEISTER, the whey of cows' milk. STOLL considered that asses' and human milk should be diluted,

and that they are injurious in the inflammatory complications and in the last stage of the malady. Whatever may be the diet and regimen adopted, milk of various kinds, in suitable forms and states of dilution, constitutes an important part of the treatment of phthisis.

471. *e.* The beverages allowed the patient should depend on the form and stage of phthisis. In an early stage whey is one of the best that can be taken. At a far advanced stage, or if diarrhœa be present, it is apt to run off by the bowels. Fermented whey, or serum of milk, or the whey of butter-milk, or recent butter-milk, may be given according to circumstances. In northern or Scandinavian countries, and also among the Tartars, the fermented serum of milk is very commonly employed, and it has been recommended by SIEVERS and others. Spruce-beer is one of the best beverages that can be used; weak tar-water is also sometimes beneficial. Seltzer-water, with milk, and lime-water or Carara-water, with milk, when the bowels are much relaxed, are also of service.

472. *f.* In recommendation of *exercise* in the open day, according to the strength and state of the patient, it is unnecessary to add anything to what has already been stated. Of all kinds of exercise, walking and horse-exercise are the best. Although the latter was considered of little use by QUARIN, yet by SYDENHAM, HALLER, MARX, DARWIN, and others mentioned in the historical sketch (§ 285 *et seq.*), it was strongly recommended. STOLL advised it in the non-inflammatory states, and when the abdominal viscera were torpid or congested. In the inflammatory complications, active exercise, either on horseback or otherwise, can rarely be taken.*

* A mechanical contrivance, or instrument, termed a "*Respirator*," has been recommended, and adopted by many, in order to raise and equalise the temperature of the inspired air, especially when exposed to a cold, raw, or dry atmosphere; or to the cold morning or evening air. It is worn over the mouth and sometimes over the nostrils also. It is probably of service when thus temporarily employed. But I believe that it is not productive of any marked benefit when worn for any considerable, or long period, owing chiefly to the circumstance of its greatly increasing the humidity as well as the warmth of the inspired air. Owing to those effects it may even be injurious in some cases, and may favour the development and softening of tubercles, especially in scrofulous and lymphatic constitutions. More careful observations of the effects of this instrument are required than it has hitherto received, for it was puffed into frequent adoption before sufficient evidence of its utility was obtained, and was received on the recommendation of its inventor, and with the belief that humidity and warmth of the inspired air produced by it were actually sufficient grounds for its adoption. But these states of the air, especially if excessive, are by no means proved to be the most salutary in all phthisical cases, or even the majority of them; and it is not improbable that they are sometimes injurious.

473. In concluding the above view of the treatment of phthisis, it will be manifest that no one plan of cure, class of medicines, kind of diet, or regimen,—no single method, whether medicinal or regimenal, or both, is appropriate to all cases, or even to a great majority of cases, of phthisis. The rational physician, after having endeavoured to ascertain the existing morbid conditions, will merely select and combine, from the stores above indicated, such means as he believes to be most energetic in arresting, counter-acting, or removing these conditions, as far as circumstances may warrant the attempt or may promise success.

PART II.

LARYNGEAL AND LARYNGO-TRACHEAL CONSUMPTION.

INFLAMMATIONS of various grades and characters, local and constitutional, often affect the larynx and trachea, either *primarily* or *consecutively*, but much most frequently they extend to these parts from the fauces, tonsils, and pharynx, and from the lungs and bronchi. These inflammations are *acute*, *sub-acute*, and *chronic*. The *acute* states, although occasionally *primary*, are generally *consecutive*, and appear first in some part of the throat and pharynx, extending with more or less rapidity to the larynx. The more *chronic* forms very rarely originate in the glottis and trachea, but extend thither from the lungs and bronchi, being, generally, consecutive or symptomatic of tubercular consumption, and forming one of the most important complications of this latter malady. The acute forms of laryngo-tracheal inflammations are always attended by much fever, or rather by states of constitutional disease, which vary remarkably in character with endemic or epidemic prevalence, with the nature of the epidemic, with the general manifestations of vital force observed in diseases generally, or the existing vital constitution, with their causes, their infectious or non-infectious natures, and with the intrinsic and extrinsic circumstances of the patient.

The inflammatory diseases of the respiratory passages are considerable in number, more especially when their various associations or complications are taken into account. Before I proceed to notice these chronic affections of the larynx and trachea which have been often termed *laryngeal* or *laryngo-tracheal consumption*, I shall enumerate, in a classified form, the several acute, as well as the sub-acute and chronic, states of disease to which these parts of the respiratory passages are liable. But I must limit myself to an enumeration merely, and extend my remarks to those

affections which, although sometimes occurring primarily, are much more frequently consecutive or symptomatic.

i. CATARRHAL OR SLIGHT LARYNGITIS OR LARYNGO-TRACHEITIS. — This, in various grades of severity, often attends common colds and sore-throats, especially dry catarrh, and is characterised chiefly by hoarseness of voice, dry cough, &c. It generally subsides in a few days, sometimes without the aid of medicine. But in faulty, weak, or cachectic constitutions, or in the inflammatory diathesis, it often passes into some one or other of the following varieties—either acute or chronic.

ii. ACUTE LARYNGITIS OR LARYNGO-TRACHEITIS may appear, as other inflammations, either *primarily* or *consecutively*, most frequently the latter; and present certain forms depending upon diathesis, previous disorder, and epidemic influence. It may be *sthenic*, especially when it occurs primarily in a previously healthy constitution; or *asthenic*, when it appears consecutively or in connection with some constitutional malady, in weak or cachectic habits, especially during epidemic prevalences, and in states of impaired vital force and of blood contamination.

A. *Sthenic acute laryngo-tracheitis* may be—*a. Primary* and *simple*, commencing in, and limited chiefly to the larynx and epiglottis, or to the larynx and trachea. It is attended by acute inflammatory fever. *b. Consecutive* and *complicated* with inflammation of the fauces, tonsils, and pharynx, or of the larger bronchi, as in sporadic and epidemic croup, albuminous exudations, forming on the inflamed surface, and the attending fever being of a *sthenic* inflammatory or phlogistic character.

B. *Asthenic acute laryngo-tracheitis* may be—*a. Primary* or *simple*, with effusion or infiltration of serum, or of a sero-puriform matter in the sub-mucous tissue of the larynx and epiglottis, often extending to the trachea, the constitutional powers being impaired, and the attendant fever more or less adynamic. This form is comparatively rare, whilst the following—*b. The consecutive* and *complicated*, is most frequent, being both endemic and epidemic and most dangerous. This form occurs consecutively upon scarlet fever, upon diphtherite, small-pox, erysipelas, malignant sore throat, low or malignant fevers, and is characterised by marked impairment of vital force, and by contamination of the circulating fluids.

iii. CHRONIC LARYNGITIS AND LARYNGO-TRACHEITIS may be either *primary* or *consecutive* of the catarrhal or of the acute, or of disease of related parts, especially of the lungs and bronchi. *a. Primary* and *simple chronic laryngitis* is limited chiefly to the

larynx and epiglottis. *b. Consecutive or complicated laryngitis, or laryngo-tracheitis*, is associated generally with disease of the lungs and bronchi, and is most frequently of a tubercular or scrofulous nature, or with chronic bronchitis. *c. Specific or syphilitic laryngitis* is attended by secondary or tertiary syphilitic symptoms, or with the general venereal cachexia. For the above forms of *acute laryngitis* and *laryngo-tracheitis*, with their several modifications, and with their descriptions and treatment, I may refer the reader to my work on "*Practical Medicine*" (vols. i. p. 295; ii. p. 684; iii. p. 1059); and now proceed to consider the *chronic states of laryngitis or laryngo-tracheitis*, frequently named *laryngeal consumption*, although most commonly a *complication* of tubercular or pulmonary consumption, from the consideration of which reference has been made to this place.

CHAPTER I.

DESCRIPTION OF LARYNGEAL CONSUMPTION.*

THE glottis may be chiefly or solely affected, or the disease may be extended to the trachea; this latter is much more rarely the chief or only seat of the disease when occurring primarily; but in the consecutive or symptomatic affections of the larynx and trachea, disease extending from the lungs and bronchi may be expected to implicate the trachea before it reaches the larynx and epiglottis.

1. LARYNGEAL CONSUMPTION IS CHARACTERISED by hoarseness or partial loss of voice, by dry cough, by soreness, tenderness, constriction or pain in the region of the larynx, by wheezing, shrill, or suffocating breathing, by a suppressed or whispering voice, as the disease proceeds, the cough becoming short and painful, sometimes convulsive, with anxiety, restlessness, slight or remitting fever, and emaciation.

2. Laryngeal consumption often commences in the form of common catarrh, particularly when the catarrhal irritation affects the fauces and pharynx and attacks the glottis. In many cases the

* SYNON. — *Laryngeal or Laryngo-tracheal Phthisis: chronic inflammation of the Larynx, or of the Larynx and Trachea.* — Phthisis Laryngea, Phthisis Laryngo-Trachealis, Laryngo-Tracheal consumption.

catarrhal affection extends on the one hand to the trachea and larger bronchi, and on the other along the œsophagus to the stomach. The catarrhal affection may either subside or pass into bronchitis, which is a frequent occurrence, or may be concentrated on the larynx, and assume an acute, or sub-acute, or chronic form of inflammation of the larynx, or of both the larynx and trachea. Whilst the catarrhal state exists the voice is hoarse or partially lost, and the cough is short and dry. There is either little or no attendant fever, or it is slight or remittent. As the catarrhal affection subsides the cough is attended by expectoration, and, with the accompanying fever, it ultimately ceases. If, however, the affection either concentrates itself in the larynx or passes into sub-acute or chronic inflammation, the local symptoms become severe and the attendant fever more marked; the disease thus presenting more or less of an acute or sub-acute state in its early stage, and passing into the chronic form. In this form it may assume various modifications with the circumstances under which it occurs, or by which it is subsequently influenced. Hence, under the generic term of "*phthisis laryngea*," several chronic affections and organic lesions of the larynx, which are often associated with changes in the structure of the *epiglottis*, or of the *trachea*, or of *both*. These affections are most frequently complicated with other maladies, especially with those in the lungs, and with other chronic constitutional diseases. They thus are—1st. *Primary, simple*, or the chief ailment,—or 2nd. *Consecutive and symptomatic*.

3. A. PRIMARY AND SIMPLE CHRONIC LARYNGITIS, OR CHRONIC LARYNGO-TRACHEITIS.—A comparatively *slight form of inflammation*, or rather a state of *catarrhal irritation* may affect the mucous membrane of the larynx for several weeks, or even for many months, and produce merely hoarseness, a frequent husky cough, scanty mucous expectoration, and a sense of soreness at the top of the wind-pipe. This affection may be limited to the larynx, or be associated with relaxation of the uvula, or with indications of a similar irritation in the fauces, pharynx, and trachea. It is most common in persons exposed to cold and wet, and in the intemperate; and generally follows a neglected catarrh, or repeated catarrhal attacks. This form of chronic inflammatory action may exist for a considerable period without producing further change than thickening of the mucous membrane and submucous tissues; but it occasionally gives rise to further changes, especially to ulceration, to softening, to serous or sero-puriform infiltration, and several other lesions about to be noticed.

4. The more *severe states* of chronic laryngitis may commence in the above catarrhal form: they may even follow the acute attacks; but much more frequently they appear with hoarseness, and with a dry husky cough; and are considered as catarrhal only, until they are followed by disorganisation and serious constitutional disturbance. They are thus insidious, not only in their *primary* and *simple forms*, but also, as will be noticed hereafter, in their *consecutive* and *complicated states*. The *symptoms* which require the closest observations are those connected with the voice, the cough, the respiration, the sensibility of the part, the physical signs referable to the chest, and the expectoration.

The *voice* is variously altered. At first, the defect of the voice is apparent only when speaking loud, or when varying the tone; but it generally becomes more and more cracked, until its healthy tone is quite lost. Hoarseness is then always present, and is, in the more catarrhal and slight cases, loose, mucous, and deep; but, in the more severe and prolonged instances, it is commonly stridulous, dry, and squeaking, or whispering. Speaking is always followed by cough and soreness or pain in the larynx. In the worst attacks the voice is more and more affected until it is altogether lost.—The *cough* is, in the early stages, short, dry, and hacking; but, in the latter stages, and when the glottis is incapable of being closed, it is loose, continuous, and hawking or peculiar, as noticed by MM. TROUSSEAU and BELLOC.

The *respiration* is usually affected sooner or later in the course of the malady. Difficulty of breathing frequently occurs in the night, and on any physical exertion, and is characterised by spasm of the glottis. In proportion to the mechanical impediment to the passage of air, and to the degree of œdema of the glottis attending the disease, are the dyspnœa and the hissing and stridulous noises on respiration increased. After the dyspnœa becomes permanent, or amounts to orthopnœa, death generally takes place in fifteen or twenty days.—The *sensibility* of the larynx is seldom very acutely affected, although it is always slightly increased. In one half the cases, pain is not much complained of: still it is felt, with a sense of soreness or tenderness, when the larynx is handled or pressed, or rubbed against the spine. The morbid sensibility of it is evinced chiefly by the effect of cold air upon it, and by the readiness with which cough is excited by this or by other causes.

5. The *expectoration* is at first scanty and mucous; but, as the disease advances to disorganisation, or becomes more intense or acute, it is muco-puriform, sanious, or streaked with blood, or even

foetid; occasionally it is adhesive and ropy. Purulent expectoration sometimes relieves the difficulty of breathing; and when this is observed in connection with pain and soreness in coughing, and with hoarseness or loss of voice, *ulceration* may be inferred to have taken place. As the ulceration and disorganisation proceed, dead or ossified portions of the arytenoid and cricoid cartilages, or calcareous substances formed in the larynx, are sometimes expectorated, and more rarely they fall into the trachea and pass into the bronchi, causing irritation, and consequent inflammation in the parts where they lodge.

6. *Difficulty of swallowing* is occasionally felt, particularly when the epiglottis is more or less implicated, or when irritation extends to the pharynx. In these, paroxysms of cough and suffocation are induced by the attempts at deglutition, and by portions of the substances taken passing into the glottis.—The *physical signs* indicating either the exemption of the bronchi and lung from disease, or the existence of disease also in these parts, are much obscured by the impediment to the circulation of air through the larynx; and more dependence may generally be placed upon percussion than upon the respiratory murmurs in evincing this exception. At almost any period of the progress of chronic laryngitis an *acute* or *sub-acute* state of inflammatory action may occur, generally with more or less œdema, or sero-mucous infiltration of the sub-mucous tissues, and terminate the life of the patient in a very short period: and this may take place almost at any stage of the disease, either previously or subsequent to ulceration. In *simple* or *idiopathic chronic laryngitis*, death is occasioned either by this occurrence or by the paroxysms of orthopnoea, caused by spasm in addition to œdema, by disease of the cartilages and other lesions, or by the suffocative paroxysms induced by the passage of matters into the diseased larynx.

7. *B. CONSECUTIVE AND COMPLICATED STATES OF CHRONIC LARYNGITIS.*—*Associated or complicated laryngeal consumption.*—The primary or simple occurrence of chronic laryngitis or laryngeal-phthisis, is very rare; whilst the consecutive states of the disease are very common. These states are chiefly two,—the first of which, or “Chronic follicular pharyngo-laryngitis,” is not infrequent, whilst the second, or that consequent upon pulmonary consumption, is observed so often as to be considered as most intimately connected with or even a part of that malady.

8. (a.) *A form of consecutive chronic laryngitis* has been described by several writers, and it appears to have lately been more

frequently observed in the United States of America than in this country. It has been described by Drs. LEE, HORACE GREEN, and POPKEN of the United States, and by other writers. I have met with a few cases of this affection, but in no instance have I had an opportunity of observing the appearances of the affected parts after death. The disease generally commences in the throat, especially the pharynx, and often, but not generally, extends to the larynx, when it is not early or judiciously treated. Dr. LEE has called this affection "*Follicular pharyngitis*." Dr. H. GREEN has named it "*Follicular disease of the pharyngo-laryngeal membrane*," or "*Tubercular sore throat*;" and Dr. POPKEN has described it as "*Tubercles of the larynx and pharynx*." This and chronic laryngitis, either primary or consecutive, are the affections which have been termed "*Clergyman's sore throat*," owing to these affections being frequent among clergymen and public speakers. It manifestly commences and is seated in the mucous follicles of the throat and larynx—commencing either in the fauces or pharynx, and extending to the larynx and glottis or even to the trachea also. But, although the follicles of these parts are enlarged, it does not follow that the enlargement is owing to tubercular infiltration. M. LOUIS remarks that his numerous *post-mortem* researches have not furnished him with any instances of tuberculous formations in the substance, or on the surface of the epiglottis, larynx, and trachea, at an age above fifteen years. Dr. WILLIAMS and Dr. CARSWELL are of nearly a similar opinion; but the latter adds,—“May it not be owing to the facility with which tuberculous matter escapes that we do not find it accumulated in the mucous surface of the large bronchi, or the trachea?” He evidently believes that tuberculous matter is often secreted on the free surface of the membranes of these parts, but, not being confined in any mucous crypt, that it is removed by expectoration as soon as it is poured out. He has, however, met with this matter in a few instances in the follicles of the larynx and trachea, and in the sacculi laryngis.

This affection of the pharynx and larynx evidently consists of chronic inflammation or enlargement, often terminating in ulceration of the mucous follicles of these parts. But whether or no the enlargement of these follicles is owing to chronic inflammation only or to the infiltration of tubercular matter has not been satisfactorily ascertained. Its occurrence is manifestly favoured by more or less disorder of the digestive organs, in connection with general or chronic debility and a cachectic habit of body; and hence the existence of tubercular matter in these follicles is the more probable.

This affection is usually very insidious in its approach, and may exist for some time without causing much inconvenience or apprehension. At length the voice becomes husky; and an uneasy sensation in the throat, frequent inclination to swallow, and hawking efforts, are experienced. A copious secretion of a viscid opaque mucus takes place from the diseased follicles, which are more or less enlarged, and the mucous membrane injected. There is generally little or no cough, as long as the disease has not extended to the larynx, but there is soreness or uneasiness in the throat, increased by efforts to swallow, and by the act of swallowing. In a more advanced stage, the "follicles are greatly enlarged, indurated, or filled with a yellow substance resembling tubercular matter," while the mucous membrane is covered with a layer of muco-puriform secretion. The disease may extend to, and down the larynx, and invade the vocal chords. When this occurs, the voice becomes weak, husky, or hoarse, or whispering, or it may be altogether lost; and speaking is always followed by soreness or pain in the larynx. Cough is not always present, but when observed it is short and suppressed. There are generally more or less debility and loss of flesh. Ultimately more or less of the symptoms of the far advanced stage of chronic laryngitis supervene, with debility and loss of flesh.

9. (b.) *Chronic laryngo-tracheitis consequent on phthisis.*—*Complicated laryngo-tracheal consumption.*—This is the most common form in which chronic laryngo-tracheal disease presents itself, the preceding form being comparatively rare, and the primary disease being still more rare. M. LOUIS found that nearly a third of the cases of tubercular phthisis examined by him after death were complicated with chronic laryngitis, this latter being the consecutive affection. It may also be associated with chronic tracheitis, with ulceration in the trachea and large bronchi, and with chronic inflammation of the epiglottis and pharynx; but the association is rarely thus limited, being generally extended to these parts from the tuberculated lungs. When chronic laryngitis extends to the trachea, or when chronic tracheitis extends to the larynx, and *laryngo-tracheitis* is thus present in a chronic form, tenderness and soreness are often felt in the course of the trachea; and, in some instances, I have observed great swelling of the throat along the whole tube; but in all these the lungs were also diseased. This swelling in the course of the trachea arises from the existence of ulceration in the internal surface of the tube, and from the œdema

or infiltration of the cellular tissue external to the cartilaginous rings.

10. *c.* The *epiglottis* may be inflamed and ulcerated without the larynx itself being materially affected, although the epiglottis is often implicated when the larynx is diseased. M. LOUIS states, that of eighteen cases of *inflammation* and *ulceration* of the *epiglottis* the larynx and trachea were free from disease in six. Of these latter, pain, more or less severe, was felt by four in the superior part of the thyroid cartilage, or between this cartilage and the os hyoides. The pain was compared to that of a sore, to a pricking sensation, or to a heat of the part. In some cases it had lasted a month or two, but in others it had occurred but a few days before death. In these cases, although the pharynx was healthy, deglutition was difficult, fluids sometimes being thrown back through the nose. The twelve patients who had ulcerations at once in the epiglottis, larynx, and trachea, complained of dysphagia, pain, and occasionally regurgitation of fluids by the nose.

11. *d.* It has been shown that *simple chronic laryngitis* is generally attended by great mechanical obstruction and stridulous breathing; but when the laryngeal affection is consequent upon, or complicated with, *pulmonary disease*, the obstruction in the larynx is commonly much less, and stridulous breathing is hardly remarked. This is owing to the circumstance of primary chronic laryngitis giving rise to more œdema, or infiltration of the submucous tissues than laryngitis consecutive upon pulmonary tubercles. In this latter the inflammatory irritation and the consequent ulceration is more superficial and less obstructive to respiration than the former. In both acute and chronic laryngitis, the vesicular murmur becomes feeble in proportion to the obstruction, as shown first by Dr. GRAVES and Dr. STOKES; and, in severe cases, it can hardly be perceived, the feebleness or absence of this murmur being equal in all parts of the chest. In order to ascertain the presence of lesions of the lungs in cases of chronic laryngitis, more reliance may be placed on percussion than on the stethoscope. Where the mechanical obstruction is but slight, as Dr. STOKES remarks, this instrument may be used with exactness; but even in cases where the lung is fully and freely inflated, it will occasionally be next to impossible to determine whether the symptoms proceed from laryngeal disease alone, or from its complication with an affection of the lung.

The principal fact to be kept in recollection in cases of laryngeal phthisis, is the very frequent association of pulmonary

disease with it, even when the larynx has been the part seemingly first attacked. There is no doubt that chronic laryngitis is in some cases first developed, and that the lungs become secondarily affected, particularly where a predisposition to pulmonary disease exists; and in these especially the susceptibility of the larynx to causes of irritation is much increased; but both maladies may commence simultaneously, and even proceed *pari passu*, that of the larynx only being manifest, owing to the nature of its organisation; and thus the pulmonary disease may seem to be consecutive, even whilst it is coëtaneous with the laryngeal, or even primary. The obscuration of the physical signs of pulmonary diseases by laryngeal affections is so great, that the former are generally masked by the latter from those who trust chiefly to these signs, to the neglect of those physiological and rational phenomena which generally accompany even the early stages of pulmonary consumption, and in which the closely observing physician confides more surely than in the proofs furnished by the stethoscope. It is only in the far advanced stages of pulmonary tubercles, that the physical signs are manifested, when they are complicated with chronic laryngitis, as shown hereafter. It may, however, be concluded, that where there are laryngeal cough, muco-purulent or purulent expectoration, hoarseness or aphonia, semi-stridulous respiration, emaciation, and hectic fever, pulmonary tubercles exist in advanced stages, whether they are indicated by the physical signs or not; and this inference is strengthened by the occurrence of night perspirations, irritability of the bowels, incurvation of the finger-nails, and various other symptoms.

12. *C. Syphilitic Chronic Laryngitis.* — *Syphilitic Laryngeal Phthisis.* — Chronic laryngitis sometimes occurs in the course of *secondary syphilis*, and it then assumes a specific form, soon passes into ulceration, the ulceration apparently extending from the tonsils and pharynx by continuity of surface to the laryngeal mucous membrane. Hence syphilitic chronic laryngitis is almost always associated with syphilitic inflammation of the tonsils, fauces, and pharynx. Mr. CARMICHAEL considers venereal ulceration of the larynx as the consequence of the *phagadenic* venereal disease; and he believes that the ulceration always propagates itself at its edges by continuity of surface from the fauces to the pharynx, and thence to the larynx.

Syphilitic laryngeal consumption is generally consequent upon various symptoms of secondary or tertiary syphilis, although some

exceptions to this have been observed. It is chiefly, however, an extension of the syphilitic ulceration from the palate and pharynx. It is characterised by tenderness, slight pain, or soreness referred to the epiglottis and larynx, by huskiness of voice, followed by a low whispering, or loss of voice; by suffocative cough, and by expectoration of a scanty sanguineo-puriform matter. There are great loss of strength and flesh, and more or less anæmia. Life is often terminated by suffocation following vital exhaustion.

13. *D.* In *Chronic laryngitis* the structural lesions are numerous:—1. The mucous membrane is red in patches, and exhibits a granular appearance, even when it is not ulcerated, owing to enlargement of its follicles; it is also apparently thickened, but this change is seated chiefly in the submucous cellular tissue, and causes enlargement and imperfect mobility of the parts, with partial obliteration or linear contraction of the ventricles of the larynx.—2. Serous, puriform, or tuberculous infiltrations of the cellular tissue, and of the internal laryngeal muscles, either with or without softening and atrophy of these muscles and of the ligaments, are often observed.—3. Wasting and fibrous degeneration of the muscles which move the cartilages of the larynx, and contractions of the ligaments, are frequently met with. These lesions account for the loss of voice in this disease.—4. Purulent collections, or small abscesses in the submucous cellular tissue, particularly in the ventricles and around the cricoid cartilage, are seen in a few cases.—5. Ulcerations of the mucous and submucous cellular tissues occur in various forms and situations, and are amongst the most frequent lesions in chronic laryngitis. The ulcers sometimes are small and round, and penetrate only the mucous membrane; occasionally they are large, irregular, and superficial, with purulent secretion on their surfaces. In some instances they are still more extensive, and, in the syphilitic laryngitis, accompanied with warty excrescences. Ulcers are not infrequently found in the ventricles, particularly in cases of phthisis, and are either rounded and superficial, or deep and irregular. The arytenoid and even portions of the other cartilages are occasionally destroyed by ulceration, but chiefly in young subjects. In most instances, and in older persons, ossification takes place in the cartilages before the ulceration reaches them. Ulcers are most commonly seen between the vocal chords and the epiglottis, but they are often found in other parts of the larynx, and in the laryngeal surface and edges of the epiglottis, and more rarely at the lower part of the larynx and commencement

of the trachea.—6. In some cases, ulcerations varying in size, form, and depth, are found in the *trachea*, especially its upper part, and in one instance I found a fistulous opening into the œsophagus. The ulcers are chiefly in the musculo-membranous portion, especially when the affection of the larynx and trachea is consequent upon disease of the lungs.—7. Ossification of the cartilages is generally observed in the more prolonged cases. The osseous matter is irregularly deposited, generally on the surface of the cartilages. The cricoid and thyroid cartilages become naturally ossified in advanced life; but MM. TROUSSEAU and BELLOC have shown that chronic laryngitis of two years' duration produces the same change in young persons, irritation accelerating those changes to which the tissues are naturally liable in the course of time.—8. Instances of *necrosis* of the arytenoid, cricoid, and even of the thyroid cartilages have been recorded by LAWRENCE, PORTER, CRUVEILHIER, OTTO, RYLAND, ANDRAL, and others. MM. TROUSSEAU and BELLOC found this lesion in more than one-half of the cases of laryngeal phthisis which they examined. They describe the cartilages to be denuded of their perichondrium, and of a dull dirty hue. The sequestrum of dead cartilage is not readily thrown off, and the cellular tissue adjoining it is generally infiltrated with a fetid pus. These purulent collections often open and discharge their contents, sometimes with dead portions of the cartilages, or with ossific deposits, or with carious portions of the ossified cartilages. The opening and discharge of these matters usually take place in the larynx, but in rare instances they have occurred into the œsophagus, or outwardly through the integuments of the neck in still rarer cases. These mortified portions of the cartilages, as well as carious portions of the ossified cartilages, and phosphatic concretions in the diseased larynx, are sometimes discharged without any preceding or attendant abscess, and merely as a consequence of ulceration. When their escape from the larynx is impeded or attended by much spasm, or when they cause much irritation on being detached, they act as foreign bodies, and occasionally produce suffocation. They may even fall into the trachea, and produce effects such as are caused by *foreign bodies in the larynx and trachea*.—9. The *epiglottis* is often enlarged, thickened or swollen: frequently, also, it is ulcerated, chiefly however in the inferior surface, and at the edges, in connexion with ulceration of the larynx and disease of the lungs. M. LOUIS found the epiglottis diseased in 35 instances out of 135 cases of tubercular phthisis. In

the *syphilitic form* of the disease, the ulceration extends from the lingual to the laryngeal surface, and sometimes destroys the whole of the epiglottis. In less common cases, it is contracted and shrivelled, and more rarely expanded and thinned.—10. Besides the above, cauliform vegetations, warty excrescences, tubercles, and more rarely cancer and hydatids of the larynx have been remarked, and some of these lesions have been seen extending to the epiglottis.

14. The *trachea* has been observed to contain morbid secretions proceeding from ulceration of its internal surface, or from disease of the bronchi or lungs. It is sometimes remarkably thickened from deposition of lymph in the submucous cellular tissue, and in a few instances a similar deposition is observed in the cellular tissue external to the cartilaginous rings. Redness and injection of the internal surface of the trachea, and ulceration as above mentioned, are commonly associated with tubercular excavations in the lungs, and are most frequently observed in its posterior or membranous part. In some cases, these changes, ulceration particularly, are confined to, or most remarkable on one side of the trachea, which invariably corresponds to the diseased lung; or, if both lungs be diseased, to that most affected. In a remarkable instance which occurred to my friend Mr. WORTHINGTON, of Lowestoft, several of the rings of the trachea were absorbed, and in consequence of the fibrous structure being deprived of its antagonising power at that part, the canal was constricted so remarkably as hardly to admit a quill, and as to suffocate the patient. *Tumours* of various kinds, *abscesses*, *aneurisms*, &c. have been found pressing upon the trachea, and even on the larynx, and causing not only permanent obstruction to respiration and spasm of the glottis, but also morbid secretions from the internal surface of these passages, and partial destruction or perforation of their parietes.

CHAP. II.

DIAGNOSIS, PROGNOSIS, AND CAUSES OF LARYNGO-TRACHEAL CONSUMPTION.

15. i. DIAGNOSIS OF LARYNGO-TRACHEAL PHTHISIS. — A peculiar laryngeal or tracheal cough, often at first dry, rough, or barking, or with little expectoration; a permanent change in the voice when the larynx is chiefly affected, followed by difficult or sibillous breathing, and pain or tenderness in the larynx, and sometimes in the course of the trachea, generally characterise laryngo-tracheal phthisis. But difficulty of breathing and pain may be wanting in the early stages of the disease, or may occur only occasionally in the advanced periods. When the laryngeal swelling or constriction is considerable, the difficulty of respiring, and the peculiar sound attending it, are sufficiently indicative of the disease; and, when these are wanting, the stethoscope will often detect a harshness in the sound of the air passing through the larynx, suggesting the idea of a roughness of surface. When the laryngeal constriction and the laryngeal perspiration are slight or altogether absent, disease of the larynx may yet be inferred as the cause of the cough and other symptoms by the negative indications of the thoracic organs, the sounds of percussion and of respiration being good throughout the chest. In abscess and mortification of the cartilages of the larynx there are laryngeal cough, foetid purulent expectoration and even hectic, and there may be no disease in the chest; but these cases differ from ordinary phthisis laryngea, particularly in the prominence and rapidity of the purely laryngeal symptoms. The difficulty of determining the complication of the disease with pulmonary tubercles in their earlier stages, or true phthisis laryngea, should lead to a careful investigation of the history of the case, with the view of ascertaining whether the laryngeal affection was primary, or whether it supervened upon disease of the lungs. If it be found that the first symptoms were sore throat, relaxed uvula, difficulty of swallowing, and were followed by those of a laryngeal character, or that a syphilitic taint had existed, there is a great probability that the first morbid action was manifested in the larynx, and that the lungs were unaffected. But if, on the other hand, it is ascertained that, previously to any hoarseness,

stridor, or dysphagia, there has been cough without the laryngeal character, particularly if it was at first dry; that the breath has been short, that there has been pain in the chest, about the collar-bones or shoulders; that hæmoptysis has occurred; that hectic has been observed, although the expectoration continued mucous; and that the patient has emaciated — that the pupils are dilated, the whites of the eyes of a bluish tint, the nails uncated, or the fingers clubbed, &c., it is almost certain that the case is in reality one of pulmonary tubercles, in the course of which laryngeal disease has occurred. If, moreover, the patient is of a scrofulous diathesis, or has already lost brothers, sisters, or a parent by tubercular disease, we may be certain that this is the nature of the case, although we can detect no physical sign of pulmonary tubercles. In examining such cases, a careful comparison of the sounds emitted on percussion by corresponding opposite portions of the chest; and successive investigations at distant periods, will show the state of the disease. If, co-existent with laryngeal cough, muco-purulent expectoration, semi-stridulous breathing, and hectic, we find a notable difference between the sounds of opposite corresponding portions of the chest, there is almost sufficient evidence of tubercular disease of the lungs. When there is copious muco-purulent expectoration of considerable continuance, we may infer the existence of suppurating tuberculous cavities in the lungs. When there are dullness on percussion or cavernous rhonchus in some part of the chest, particularly under a clavicle or scapular ridge, with copious expectoration, night sweats, emaciation, &c., an advanced period of the tubercular disease is présent.

16. ii. THE PROGNOSIS OF LARYNGO-TRACHEAL PHTHISIS entirely depends upon the states in which it is presented to our observation. In its *simple* and *mild forms*, a favourable yet cautious opinion may be given; for although they will generally yield to judicious treatment, exacerbations, œdema, or even ulceration may take place. If, however, even these forms occur in a faulty or scrofulous constitution, a much more unfavourable opinion should be formed of the result. I have met with a few cases in which the chronic state, with very hoarse voice and speech, was protracted for many years; and in two instances, through the greater part of a long life, no other inconvenience being experienced. If, however, the disease has continued for any time; if it have not been amenable to treatment; if the expectoration has become abundant; and especially if the history and existing state of the case, and the presence of the symptoms noticed above, indicate its connection

with pulmonary disease, a most unfavourable result may with certainty be anticipated. Fœtor of the breath and sputa indicates mortification of the cartilages, and is very unfavourable; but in simple laryngitis there is still a chance of the dead portions being thrown off, but there is no chance of laryngeal disease being cured when it is dependent upon tubercular excavations in the lungs. In the *syphilitic form* of chronic laryngitis, if the general health has not suffered much, and if the lungs be sound, the patient may recover; but the chances will depend entirely upon the degree of local lesion and the general state of the frame.

17. iii. THE CAUSES OF LARYNGO-TRACHEAL PHTHISIS.—*Laryngo-tracheal consumption* being, as shown above, generally a consequence of tubercular disease of the lungs, it necessarily follows that the causes of the latter malady are also those of the former affection,—both predisposing and exciting causes. The exceptions to this are chiefly those cases which are primary, or are the consequences of follicular pharyngitis, or “clergyman’s sore throat.”—(a.) The circumstances more especially *predisposing* to laryngo-tracheal consumption are, dry or chronic catarrh, frequent or habitual occurrences of sore throat; indigestion connected with biliary disorder, or with accumulations of bile in the biliary organs, and of morbid secretions in the alimentary canal; habitual intemperance, either in eating or drinking, particularly the latter; severe or prolonged courses of mercury, and unusual exertions of the voice. When inflammations of any kind attack the throat, or parts adjoining, their extension to the larynx is favoured by accumulations of morbid secretions and excretions in the abdominal viscera, and by depressed states of the powers of life,—a fact of great practical importance, and hitherto insufficiently attended to both in our pathological reasoning and in our therapeutical indications.

Persons of a scrofulous diathesis,—those liable to cutaneous eruptions, or who have been suffering for a long time the more severe forms of indigestion, particularly cardialgia with acrid eructations, and all disposed to, or already affected by, tubercular disease of the lungs, are especially *predisposed* to laryngo-tracheal phthisis. Its dependence upon pulmonary consumption is most frequent and intimate, as I have already stated. It is most common at the middle period of life, or probably somewhat earlier, at least according to my experience. Dr. H. GREEN believes it to be most frequent between the ages of twenty-five and thirty-eight years, more especially its complication. It is probably more frequent in males, owing to greater exposure to its causes, particularly to shaving the beard—the natural protection from cold and inhalation of dust.

18. (b.) *The exciting causes* of laryngeal phthisis are often the same *causes* as have been now enumerated; but the chronic sometimes succeeds the acute disease, and much more commonly it follows the frequent recurrence, or neglect, of the slight or catarrhal state of irritation mentioned above (§ 17). — Great or prolonged exertions of the voice, particularly by those addicted to the use of spirituous liquors, and the combination of neglected catarrh with intemperance, are the most common causes. Mercurial courses, the extension of syphilitic ulcers from the throat, dust or grosser foreign bodies inhaled or passing into the larynx, and injuries of the throat, also sometimes occasion laryngeal phthisis.

19. (c.) *Pathology of Laryngo-tracheal Consumption.* — This disease, in its primary and consecutive states, affects the mucous membrane or its follicles, or both, but in which of the two tissues it originates cannot readily be determined. The more acute or sub-acute primary forms may probably commence in the mucous or sub-mucous tissues, and extend to the follicular glands; and the consecutive and complicated forms may be developed in the mucous follicles by the morbid secretion and irritation to which they are exposed in the course of catarrhal and pulmonary diseases, these follicles being either primarily affected, or coetaneously with the membrane and sub-mucous tissue in which they are seated. It is, however, in the more chronic affections of the larynx and trachea, especially those which are consecutive and symptomatic, that their follicles are either consecutively implicated, and especially when these affections are complications of pulmonary consumption. The question as to the origination of disease in the follicles themselves, owing to the formation of tubercular matter in them, has hitherto not been sufficiently discussed, owing to the denial, by several eminent pathologists, of this matter having been detected in them. The detection of this matter in them in rare instances has been stated above (§§ 8), and the reason for the rarity of the detection of this matter has been assigned. If it be granted that tubercular matter is formed in the mucous follicles of the larynx and trachea as well as in the pulmonary tissue, it may be admitted that phthisis may originate as early in these parts as in the lungs, or even earlier in some cases, the tubercular infiltration in the latter organ being in these consecutive upon the early or primary formation of tubercular matter in the mucous follicles of the larynx and trachea. Admitting the early existence of tubercular matter in these follicles, or the coetaneous formation of it in them and the lungs, it may be inferred that the protracted irritation of the mucous follicles by cough and morbid secretions passing over them will enlarge these follicles,

soften and develop the tubercular matter they contain, provided that it exists in them, increase their discharge, thicken and somewhat soften the mucous and sub-mucous tissues, and ultimately occasion an ulceration of the mucous follicles, and an atrophy, with increased softening of the mucous and sub-mucous membranes. That the affection of the muciparous glands, in the advanced course of phthisis, is developed or occasioned not only by the morbid secretions passing over them, but also by the deposit of tuberculous matter in them is extremely probable. Dr. H. GREEN insists upon this latter change, although, as already stated, it is denied by several eminent pathologists. In either case, the treatment cannot materially differ. He also often observed in the United States this affection of the throat and larynx after influenza, eruptive fevers, and more particularly in persons habitually using tobacco. Dr. GELLERSTEDT considers the ulcerations so commonly found in the larynx, in phthisis, to be of tubercular origin; while those of the trachea he regards, with LOUIS, as of an aphthous nature, arising from the constant irritation of the cough and expectoration.

CHAP. III.

TREATMENT OF LARYNGO-TRACHEAL CONSUMPTION.

ALTHOUGH the more rare, or primary state of this disease requires a special and appropriate treatment, the consecutive states, more particularly those consecutive upon, or connected with, pulmonary phthisis, require chiefly those means which have been assigned to the forms of pulmonary consumption described in the First Part of this work.

20. i. *The treatment of the primary form of Laryngo-tracheal Consumption* may be admitted to consist of the following indications: — 1st. To remove the inflammatory action and its consequences in the larynx: — 2nd. To improve the general health; and 3rd. To relieve urgent symptoms. — A. In order that the *first* of these intentions should be the more readily accomplished, as well as to prevent the exacerbations of the disease, or accessions of severe cough or spasm of the glottis, the patient should avoid exposure to cold air, and other causes of irritation, particularly dust, smoke, fumes, gases, and every exertion of voice or speech. He

should *rest* the organ as much as possible, and speak only when it is necessary, and then in a whisper merely. MM. TROUSSEAU and BELLOC think that speaking in a whisper is attended by no evil. The patient ought to have recourse to a *Respirator* on all occasions of passing from a warm to a colder air; and he should pay attention to his diet and regimen, shunning every thing that is difficult of digestion, or that may offend the stomach or bowels, or excite the circulation.

21. *a. Local blood-letting* is very rarely required in this form of the disease, and only in plethoric and robust persons at the commencement, or when the chronic symptoms become aggravated into a more acute state. *Cupping*, or *leeches* applied to the sides of the neck, below the level of the larynx, are frequently of use in these circumstances, and particularly when pain or tenderness of the larynx is felt. If the disease has been consequent upon suppression of the menstrual or hæmorrhoidal discharge, leeches should be applied to the tops of the thighs, or to the anus.

22. *b. External derivation* or revulsion is more beneficial than local depletions when the disease has been of some standing, a recourse to which should then be contingent only upon certain circumstances. Various means of derivation have been advised, and each has been in vogue for a time. First the tartar-emetic ointment was employed, especially in this country; and then moxas were recommended on the continent particularly. Afterwards frictions with croton oil were advised, and various liniments and embrocations containing liquid ammonia. Besides these, blisters, the liquor lyttæ, mustard cataplasms, &c., were resorted to; and there are few of these which have not given temporary ease in a few cases, or have either been of no avail, or aggravated the malady, in others. The general error was, that they have been applied either over, or too near, the larynx — too close to the seat of irritation to derive from or subdue it; and hence from their proximity rather administering to its duration than arresting it. These, if employed at all, should be applied at a distance from the larynx, as on the sides or nape of the neck, or top of the sternum. The only external application that can be prescribed with advantage on the throat itself is either of the terebinthinate embrocations already mentioned (see p. 226): the inhalation of the fumes from it, especially when their escape is moderated by a covering external to the flannel on which it is applied, is generally beneficial. A caustic, mezereon, or pea-issue, setons, or small open blisters, or a pustular eruption produced by means of tartar-emetic ointment, and

kept freely suppurating or discharging in the nape or sides of the neck, or at the top of the sternum, are the most deserving notice, of the various modes of procuring a continued purulent discharge.

23. *c.* Many physicians have recommended a mild *mercurial course*, in order to fulfil the first indication of cure; and in a few *primary cases* it has been successful, although a more severe course, and the contingencies connected with it, have in some instances even caused the disease, especially in those exposed to atmospheric vicissitudes and in the intemperate. MM. TROUSSEAU and BELLOC adduce several cases of the success of a general mercurial treatment, even when the disease was not of the syphilitic species; and state that many cases truly desperate were cured by giving mercury to salivation. When this practice is determined upon, calomel may be given, triturated with sugar, in small or moderate doses, and in the form of linctus or electuary, so that it may come in contact with the pharynx and epiglottis; and its use should be persisted in until the mouth becomes affected, or slight salivation is produced. A diminution of pain, or of constriction of the larynx; an improvement of the voice, and a looser and easier cough, indicate the good effects of this course. I have had no experience of this treatment, having had little or no confidence in it, but I have often prescribed *gargles* with the bichloride of mercury, and sometimes with benefit: also gargles with the muriate of ammonia, or the nitrate of potash.

If these fail, or cease to be further beneficial, a recourse to appropriate medicines, prescribed in the form of *linctus* or *electuary*, or in similar semi-fluid vehicles, is occasionally of service. Those which are demulcent and cooling are commonly to be preferred; and I have generally employed various syrups and mucilages containing small doses of nitre, or of hydrochlorate of ammonia, and of camphor or of benzoin, with narcotics and sedatives, according to the peculiarities of the case; taking care not to offend the stomach, or to disorder any of the several digestive processes. If these means do not afford decided benefit, the liquor potassæ may be given, with small doses of a solution of the iodide of potassium, and with camphor and narcotics, either in the form of mixture or linctus. The *inhalation* of vapour or steam imbued with the fumes of camphor, tar, turpentine, narcotics, balsams, &c., as advised by me for the chronic forms of BRONCHITIS (see PART III.), is sometimes of service, and is, as just remarked, one of the sources of the benefit afforded by the terebinthinate embrocations recommended to be applied to the neck and throat in this disease. *Narcotics* are

generally useful in allaying irritation and cough. The extracts of *belladonna* and *stramonium* may be added to the warm fluids used for the purposes of the inhalation of their steam, or they may be applied by friction to the anterior part of the neck. The salts of morphia may also be employed endermically on the back or nape of the neck.

24. The above treatment will generally remove the *primary form* of phthisis laryngea, if it have been adopted before extensive ulceration or destruction of the cartilages has taken place; and will sometimes be successful even in the specific or syphilitic form of the disease; but when these lesions exist, slight hopes can be entertained from any mode of cure. MM. TROUSSEAU and BELLOC have recommended a *local plan of treatment*. They observe that whenever inflammation becomes chronic, and affects only a circumscribed part of the economy, it commonly resists the most extensive and active general treatment; and that, on the contrary, it is almost always modified by topical treatment, whatever be the means. This, to a certain extent, explains the difficulty with which internal local diseases are cured, compared to those which are external. They consider it therefore obvious that, if by any means local applications could be made to the mucous membrane of the *larynx* without interrupting respiration, many cases might be cured which are considered incurable; and this they believe that they have done.

25. *d.* The *inspiration of dry or moist vapours* has been recommended in *phthisis laryngea* and in other affections of the respiratory apparatus; but those which have been employed — and often too empirically prescribed — have been either too acrid, stimulating and concentrated; and not being confined in their operation to the larynx, but acting upon the respiratory surfaces generally, have proved more injurious than beneficial. The action of these cannot be limited; and hence those only which I have already advised (see p. 289), or which are recommended for chronic bronchitis, and which are balsamic, aromatic, emollient, and narcotic, and cannot injure the lungs, should be employed. MM. TROUSSEAU and BELLOC confine themselves to those which I had advised in the above article, long before the publication of their work; but they recommend still more active, and more strictly topical means, consisting of both *liquid* and *dry applications*.

26. *e.* The *liquid applications* used by these writers, consist of solutions of nitrate of silver, corrosive sublimate, sulphate of copper,

and per-nitrate of mercury. They prefer, however, the solution of nitrate of silver, from the application of which no inconvenience has arisen. The solution of corrosive sublimate, of the strength of from one to eight grains to the ounce of distilled water, they found to be very serviceable in some cases of syphilitic ulceration. The solution of nitrate of silver, in the large proportion of twenty to forty grains of the crystallized nitrate to the ounce of distilled water, they apply to and behind the epiglottis, by a small roll of paper bent at its moistened end, or with a small piece of sponge fixed to a rod of whalebone bent, at an inch from the sponge, at an angle of 80 degrees. The patient's mouth being opened wide, and the tongue pressed down, the sponge is passed to the top of the pharynx; and as soon as it reaches it, a movement of deglutition is produced, which carries the larynx upwards, at which movement the sponge is brought forward and squeezed under the epiglottis, and the solution freely enters the larynx. Convulsive cough and sometimes vomiting ensue; but the application causes no pain. MM. TROUSSEAU and BELLOC have another means of effecting their object. To a small syringe, like ANEL'S, a canula, at least five inches in length, and curved at its free extremity, is attached. The syringe is filled three-fourths with air, and one-fourth with a solution of the nitrate of silver. The canula is then introduced into the posterior fauces, opposite the larynx, and the piston being rapidly advanced, the liquid, mixed with the air in the syringe, falls in a fine shower on the superior part of the larynx and œsophagus. The patient is immediately seized with a violent fit of cough, which, however, need give no alarm. He is then immediately directed to gargle his throat with water acidulated with muriatic acid or with salt water, which decomposes that portion of the solution which is not combined with the tissues.

27. *f. Applications in the form of powder* to the larynx have likewise been recommended by MM. TROUSSEAU and BELLOC. Among these may be mentioned, in an inverse ratio to their power, — the sub-nitrate of bismuth, alum, acetate of lead, sulphate of zinc, sulphate of copper. Calomel and red precipitate also produce remarkable results in cases of ulceration, whether syphilitic or not, of the mucous membrane of the larynx. All these, excepting the sub-nitrate of bismuth, which may be applied pure, ought to be mixed with finely-powdered sugar or sugar-candy in variable proportions, according to their activity: calomel with twelve times its weight of sugar; red precipitate, sulphate of zinc, and sulphate of copper, each with thirty-six times its weight; alum with twice its

weight; and acetate of lead with seven times its weight of sugar; and nitrate of silver with twenty-two, thirty-six, or seventy-two times, its weight of sugar. The last is said to be most successful in erythematous laryngitis with erosions or ulcerations. The powders should be impalpably fine; the least roughness or perceptible fragment of a crystal occasions such cough as expels the powder. The powder is put into one end of a reed or glass tube, and the other is carried back as far as possible into the mouth. After a full expiration, the patient closes his lips around the tube and inspires suddenly and forcibly through it, some of the powder being thereby carried into the larynx and trachea. The cough which the powder excites is advised to be restrained as much as possible, so as to prevent a too speedy expulsion of it. This mode of applying these powders may be resorted to twice or even oftener daily, according to the nature of the case; but the mercurial powers should not, especially at first, be applied oftener than twice or thrice a week.

28. *g. Applications to the pharynx* are often beneficial in laryngeal phthisis; for it is well known that this disease often originates in the mucous membrane of the *throat*, and extends to the pharynx and thence to the epiglottis and larynx; and that it is often protracted by enlargement or relaxation of the *uvula*, sometimes with other affections of the throat. Caries even of the teeth may affect the pharynx and larynx. In such cases, the treatment should be directed to the primary affection. An elongated uvula should be shortened, and suitable gargles prescribed. BENNATI extols gargles of alum and sulphate of zinc. MM. TROUSSEAU and BELLOC prefer the nitrate of silver, and, when angina pharyngea coexists with chronic laryngitis, they touch, two or three times a week, the tonsils and arch of the palate with a pencil of nitrate of silver or a solution of the same; or they apply a powder consisting of six or eight grains of the salt to about a drachm of powdered sugar. A strong solution of corrosive sublimate or of sulphate of zinc fulfils the same intention. Even when the mucous surface of the posterior fauces or pharynx is not affected with inflammatory irritation, the same means have been useful in this disease.

29. The treatment of the several forms of laryngo-tracheal phthisis by inhalation, insufflation, lotions, and the application of the solid nitrate of silver to the tonsils, uvula, and pharynx, has been adopted by several writers of eminence in this country, the United States, and France. Dr. Laycock remarks, in an able article in the *British and Foreign Medical Review* (vol. xxiv. p. 497),

that the application of the nitrate of silver to the cavity of the larynx is not, however, to be classed among ordinary methods of cure; and the practice of it by Dr. GREEN seems to have been received with so much incredulity in the United States, that he has thought it necessary to multiply evidence as to the fact that he has introduced a strong solution of nitrate of silver within that cavity. "Trousseau and Belloc are supposed, by Dr. GREEN, to have been the first to prescribe and employ topical medication in chronic laryngeal disease. They found a solution of the nitrate of silver, in the proportion of two or sometimes four scruples to an ounce of distilled water, to be the most efficacious and harmless application. Two methods were adopted by them: the one was to saturate a small sponge attached to a bent rod of whalebone, and to manipulate so that the solution be expressed into the larynx: the other was to use a small silver syringe, with a tube suitably adapted for effecting the same object. Dr. GREEN, however, several years before the appearance of Messrs. Trousseau and Belloc's book, had instituted experiments, and come to a similar conclusion." Dr. Laycock further remarks that, without wishing to disparage the labours of our Gallic or American brethren, Sir Charles Bell successfully adopted the method of treatment so fully illustrated by Dr. GREEN; and Dr. L. refers to cases published by Sir C. Bell (*Surgical Observations*, &c. Lond. 1816, p. 34), for which this practice was employed. Dr. Watson states that Sir C. Bell had recourse to this local application of the strong caustic solution in a case under his care; and remarks in his Lectures as follows, on the practice:—"It is said that a little practice will enable a person to pass his finger into a patient's throat, and to familiarise his sense of touch with the ordinary condition of the upper part of the respiratory apparatus, so as to be able to detect swelling, or irregularity, or thickening about the chink of the glottis. And great advantage is said to have been obtained from applying remedies directly to the diseased or irritable part. This practice was much followed by the late Mr. Vance, who had been for many years a naval surgeon; and he called it, in naval phrase, *swabbing* the affected organ." Whatever success may result from this method of treatment, should be partly ascribed to skilful and nice manipulation, and therefore it ought not to be attempted unless with due care and preparation on the part of the operator.

30. *B. The second indication*,—viz. to improve the general health, is required, and without attention be paid to it, the local measures above advised may be employed in vain. The means to

be adopted in order to attain this end ought to vary with the circumstances, and especially with the origin and complications of individual cases, and should be employed contemporaneously with local treatment, for this latter ought not to be trusted alone. When indications of irritation are observed in the throat or pharynx, or when the uvula is elongated, the digestive functions will be rarely found undisturbed. These should be improved by mild tonics and purgatives, and by stomachic aperients and alteratives. The compound steel mixture with the compound decoction of aloes; or the infusions of cinchona or cascarilla or gentian, with the iodide of potassium with liquor potassæ and sarsaparilla, are amongst the most suitable medicines that can be resorted to with this intention, after the secretions and excretions have been evacuated. If these fail, recourse may be had to more energetic remedies, and I have not found the subjoined otherwise than beneficial.* A residence in a mild, equable and congenial climate, strict attention to diet and regimen, and the use of mild chalybeate and deobstruent mineral waters, will very materially assist other means of cure. When the laryngeal affection is dependent upon an early stage of pulmonary *tubercles*, these will be especially requisite, particularly change to a dry, mild and equable climate.

31. In the *syphilitic form* of the disease, the constitutional cachexia must be removed as already hinted at, by a mild mercurial course, or by a course of iodine and sarsaparilla. In this species, gargles or the local application to the larynx of solutions of corrosive sublimate, and the exhibition of this substance internally, in the form either of pills or of solution until the system is affected, or conjoining it with tonics, sarsaparilla, &c., are sometimes very advantageous.

32. *C. The third indication*—or the relief of urgent or dangerous symptoms, is often called for in the course of the disease. Several of the means already mentioned, and recommended to be

* No. 19. R—Ferri Sulphatis, gr. xvj.; Quinæ Sulph., gr. xij.; Camphoræ, gr. xij.; Pilulæ Galbani Comp.: Extr. Fellis Bovinæ, āā, ʒij., Pilulæ Aloes c. Myrrhā ʒss.; Olei Anisi q. s. Misce, dein Contunde et divide in Pilulas xxxvj. Sumatur una vel sumantur binæ bis terve in die.—Vel:

No. 20. R—Pilulæ Ferri Comp. ʒij. (vel Ferri Ammonio-Chloridi ʒss.); Pil. Galbani Comp.; Pilulæ Conii Comp. āā, ʒss.; Extr. Aloes purif., Extr. Hyoseyami, āā, ʒj. Contunde bene et divide in Pilulas xxx, Capiat æger j. vel ij., ter quaterve de die.—Vel:

No. 21. R—Tinct. Ferri Sesquichloridi ʒvj.; Quinæ Disulph. gr. xxxij.; Acidi Hydrochlor. diluti ʒij.; Acidi Hydrocyanici diluti ʒjss.; Syrupi Zingiberis ʒvj.; Aquæ Destillatæ ad ʒiv. Misce, et fiat Mistura, cujus sumatur Cochleare unum minimum bis terve in die in aquæ cyatho vinario.

conjoined with other remedies, intended to answer the *first* intention, as the internal and external use of narcotics, anodynes, and demulcents, particularly stramonium, belladonna, &c., will be required to fulfil this indication. Still, however skilful the treatment may be, these and other combinations of means may fail to prevent, or accidents may occur to produce, impending danger. Persons of a nervous temperament and females require restorative and tonic remedies, such as those now recommended, not merely to fulfil the second indication, but also to prevent the occurrence of urgent or dangerous changes. In cases where the epiglottis is so ulcerated, or otherwise injured as not sufficiently to protect the rima glottidis, articles of food or foreign bodies may become entangled in, or may pass, the larynx into the trachea; and these, or threatened suffocation from other circumstances, as from the sudden infiltration or abscess of the submucous tissues, may require *tracheotomy*. When this operation has been resorted to, and a canula of sufficient diameter introduced, the affection of the larynx should be treated in a suitable manner, care being taken, in the way above advised, not to allow secretions to accumulate in the trachea so as to interrupt respiration. When the organ is capable of performing its functions, the canula may be withdrawn, and the wound will soon afterwards heal. If the disease of the larynx be of such a nature that the air cannot pass through the glottis, the canula must be continually worn. MM. TROUSSEAU and BELLOC adduce an instance of its having been worn for ten years.

33. *Females* suffering under chronic laryngitis, often experience violent exacerbations and laryngeal spasms, sometimes threatening suffocation. In these cases, especially when occurring in hysterical temperaments, the application of the terebinthinate embrocations (p. 226) around the neck, or a belladonna plaster or ointment, and recourse to an enema of spirits of turpentine and castor oil, sometimes with camphor or assafoetida, will generally remove the attack.

34. ii. *The treatment of consecutive or complicated laryngo-tracheal consumption* evidently depends much upon the form and stage of the pulmonary or pharyngeal disease, of which it is a symptom or complication. To this disease the treatment necessarily must be chiefly directed; whilst such local and other means as the laryngeal affection may require, or such as the associated symptoms, and the progress of the complicated malady may suggest, should be adopted. These means have been directed above chiefly to the primary states of laryngeal phthisis, and are very frequently

successful. But where the laryngeal complication occurs in the advanced course of pulmonary phthisis, this practice can prove only of temporary benefit. I have been consulted in many cases of this description where it had been said to have been resorted to, but apparently either with no advantage, or with very temporary relief. However, in idiopathic or primary cases, or when the complication occurs in an early stage of phthisis, for which a rational and an appropriate treatment is prescribed, this local medication of the laryngeal complication may be employed, by one capable of performing it, safely and satisfactorily. I do not, however, believe that the appliances here advised, often enter the larynx and trachea; whatever benefit results arises from the applications to the under surface of the epiglottis and adjoining parts. I have, since the commencement of my practice, trusted much in those cases to the inhalation of the weak vapour of turpentine arising from the application of the embrocation so often mentioned, either around the throat and neck, or to the chest, or between the scapulæ.

In this complication, whilst appropriate local means are employed, the restorative and tonic remedies advised for pulmonary disease, according to its forms and stages, and those now prescribed (p. 235 *et seq.*), should be adopted, but not without a close observation of their effects, modifying and combining them accordingly, and resorting to change of air and localities, to hygienic measures and suitable diet. In both the primary and complicated states of laryngo-tracheal phthisis, the *respirator* in its most approved forms should be used in the circumstances which appear to require it, and as the patient's feelings may suggest.

35. Laryngo-tracheal disease is sometimes complicated with chronic bronchitis, chiefly in middle or advanced age, but also occasionally in children. In most cases the laryngo-tracheal affection is at first slight, and gradually subsides as bronchitis becomes developed, but in others it is more severe and permanent, the bronchial disease also becoming chronic and sometimes very protracted. Ulcerations more or less advanced, varying in numbers and size, are observed in the trachea and larynx after death, which is generally caused by the extension of the inflammation to the capillary bronchi, generally in both lungs, and to vital depression and asphyxia. This state of laryngo-tracheal complication is most apt to occur in the course, or as a sequel, of measles and hooping cough, and in the progress of bronchitis when either complicating or following influenza or measles.

36. In these states of complicated disease the restorative treatment recommended above (p. 235 *et seq.*), aided by the external means, more especially the embrocations, &c., there advised is more especially required. It should not be overlooked, that the extension or complication of the morbid action is favoured by its asthenic character—by impaired or depressed vital force—and that the restoration of this endowment, by means suitable to the peculiarities of the case, is particularly indicated.

The selection of the means for accomplishing this intention is not always easy, but it should be directed by the features of particular cases. The decoction of senega, the preparations of camphor, of ammonia, of sulphur, of myrrh, of cinchona, of iron, &c. are severally required; and they may be variously combined with each other or with other medicines, and aided by a suitable diet and regimen.

In rare cases the complication of tracheal, or of laryngo-tracheal disease with bronchitis of protracted duration has been attended by large ulcerations in the trachea, with thickening, softening, and small ulcerations in the larynx, and with the morbid appearances described in the *part* of this work in which chronic bronchitis is discussed. These cases have, according to my observation, occurred chiefly in aged persons. In two of these, which I saw in consultation, one large ulcer had perforated the membranous part of the trachea, and opened into the œsophagus, the fistulous communication with the latter canal having existed some days before death. In one the perforation was near to the larynx, in the other it was much lower; but in both smaller ulcerations existed in the larynx, and in the large bronchi and their ramifications.

37. In the severe epidemics of *Influenza* of 1833 and 1837 bronchitis was a frequent complication, laryngeal and tracheal irritation being also sometimes present, occasionally originating the bronchial affection. In a few instances these affections became chronic and intimately associated. At their commencement they were attended by great hoarseness, and by a dry barking cough, which became clanging, convulsive, or strangulating. When this complication became chronic it passed in some cases into a form of laryngo-tracheal phthisis, and was ultimately associated with tubercular disease of the lungs. Although originating in some cases with, or appearing in other cases in the course of the attacks of influenza, yet it occurred not infrequently as the influenza subsided, or as a sequela of the epidemic attack. In some this association appeared a considerable time after the influenza, which had manifestly

disposed to the laryngo-tracheal, and to the extension to the bronchi and lungs, upon exposure to the exciting causes.

The *treatment* of these associations of the laryngo-tracheal affection with influenza and with asthenic and chronic bronchitis consisted chiefly of the remedies advised for these forms of bronchitis, especially the decoction of senega, camphor, ammoniacum quinine, the ammonio-chloride, or the ammonio-citrate of iron, or the tincture of the former, and preparations of cinchona with ippecacuanha, with the solutions of the acetate or the citrate of ammonia, the spirits of ammonia, of ether, &c. The warm terebinthinate embrocations and fomentations already noticed were applied around the neck and throat, or to the thorax, or between the scapulæ; whilst the digestive, the assimilating, and the excreting functions were promoted by the remedies just mentioned, or by others calculated to support the vital force, and the discharge of its various offices. In this complication vascular depletions, even local depletions, were not indicated, nor were they attempted. A restorative diet was generally required, aided by stimulants and tonics, as circumstances suggested a cautious recourse to them.

PART III.

THE FORMS, COMPLICATIONS, CAUSES, AND TREATMENT OF BRONCHITIS.

THE several forms of inflammation of the bronchial mucous membrane—of the mucous surface of the bronchial ramifications—are amongst the most frequent, and often the most dangerous diseases, to which the inhabitants of the British Isles are liable. The great mortality by bronchitis, in different epochs of life, is shown by the tables which have been compiled from the returns made to the Registrar-general, and which will be given in the sequel. The results will indicate the importance which should be attached to the primary or idiopathic states of this disease, which are those chiefly returned, and also to those associations of it with other maladies that often render them more or less dangerous, or conduce to, even when not the actual cause of, a fatal issue. There are few diseases, so extensive, so serious, and in very young and very aged persons, so fatal, that have received so little attention from medical writers, as bronchitis has received; and there are still fewer, with the exception of fevers and phthisis, which present greater modifications, especially in connection with the states of vital force, and with endemic and epidemic prevalence, than are presented by this. Bronchitis was treated by me at considerable length in the first part of my "*Dictionary of Practical Medicine*," published in 1832. Since that time my observation of its forms, complications, and treatment, has been uninterrupted owing to its frequency in all ages, and in all classes of the community. The amount of its frequency may be inferred from the number of deaths by it, which is about half as

great as that by phthisis, and seeing that it is a much more curable disease than phthisis, its much greater prevalence must be manifest. During 1859 and 1860 bronchitis was more prevalent than I ever knew it to be and much more fatal.

CHAPTER I.

DESCRIPTION OF THE FORMS AND GRADES OF BRONCHITIS.

BRONCHITIS may be generally characterised or defined as follows:—*Cough, with or without rigors, often preceded by coryza, and followed by expectoration of a transparent, pale, glairy, and watery fluid; more or less febrile commotion, dyspnœa, and slight soreness, heat, or tightness of the chest, which are diminished as the expectoration becomes more abundant and opaque.*

1. This important disease*, until Dr. BADHAM directed particular attention to it, was, according to the particular form it assumed, confounded with common catarrh, with pneumonia, under the appellation of peripneumonia notha, and with other diseases of the lungs and air-passages, more especially tubercular consumption, dyspnœa, &c. Dr. YOUNG seems to have viewed it as a modification or extension of inflammation of the trachea, or even as synonymous with that disease, probably from their occasional complication, or succession to each other. J. P. FRANK appears to have been among the first who directed attention to the frequency and importance of inflammation of the bronchial surface. “Cum vero,” he observes, “profundius per tracheam penetrat, ac in bronchia descendit inflammatio; tunc in primo casu tracheitidis speciem, in altero peripneumonïe imaginem refert, in qua ultima vix non constantem internorum bronchiorum phlogosin in centenis cadaveribus deteximus.” (*Interp. Clin.* p. 110.) “Rectam habebis febrium catarrhalium saltem fortiozem ideam, si eas pro inflammatione bronchiorum, sive pro bronchitide consideres” (*De Cur.*

* SYNONYMES.—*Bronchitis*, Badham, Hastings. *Erysipelas Pulmonis*, Lommius. *Catarrhus pituitosus*, *Angina bronchialis*, Stoll. *Catarrhus suffocativus*, Auct. Var. *Bronchitis Catarrhosa*, Hildenbrand. *Peripneumonia Bronchitis*, J. Frank. *Bronchite*, Fr. *Die Entzündung der Luftröhrenäste*, *Bronchialentzündung*, Ger.—*Inflammation of the Bronchi*.—*Bronchitis*, acute, sub-acute, and chronic; *Acute*, *sub-acute*, and *chronic inflammation of the bronchi*; *Inflammation of the mucous surface or membrane of the bronchial or respiratory canals*.

Hom. Morb. p. i. t. i. c. vi.). BROUSSAIS also noticed the frequency and importance of inflammation of the mucous surface of the bronchi (*Hist. des Phlegemas. Chron. t. i. p. 75.* Paris 1800). But it is chiefly to the writings of BADHAM, BROUSSAIS, HASTINGS, LAENNEC, VILLERMÉ, ALCOCK, ANDRAL, and CHOMEL, that we are indebted for our knowledge of it as a specific disease.

2. Bronchitis commences variously, and assumes different forms and states, according to the intensity of the exciting causes, the severity of the attack, and the constitution of the patient. I shall consider it chiefly with reference to its activity and duration to the states of vital energy and the age of the patient, to its forms and complications, and to its results. Its general prevalence, severity, and not infrequent fatality, require for it a more particular notice than it has received, even recently, from several systematic writers. This will appear somewhat singular, when I state that I know of no disease that is more frequent, or productive of a greater number of deaths, in children than it, in its different states and complications. BRONCHITIS assumes different grades of severity, and a modified type, according to the habit of body and vital energy of the patient, and the extent to which the inflammatory action advances along the bronchial tubes. It presents itself in practice, as a *primary disease*, in three forms:—1st, Common catarrhal bronchitis, in which only the mucous membrane of the large bronchi and trachea are affected by the specific and often infectious inflammatory irritation constituting *catarrh*: 2nd, Sthenic or true bronchitis, in which the inflammatory action is more acutely marked — is of a more phlogistic description, probably from its further extension along the bronchi, and from both the mucous and the submucous tissue of the tubes being affected; and, 3rd, Asthenic bronchitis, where, owing to weak vital energy, the inflammatory irritation assumes a lower and more asthenic grade, and extends still more generally, or affects especially the minute bronchi, interrupting their functions, and preventing those changes from taking place in the blood which are requisite to the support of the nervous and vital manifestations.

3. i. CATARRHAL OR MILD BRONCHITIS.—This form of the disease has generally been termed *Catarrhal Bronchitis* (*B. Catarrhalis*); *Mild Bronchitis* (*B. Mitis*); *Pulmonary Catarrh*, *Bronchial Catarrh*, *Catarrhal Fever*; *Bronchitis serosa*, &c. — This is the most common form of the disease, and generally commences with coryza, or with slight hoarseness or sore throat, and other symptoms of catarrh extending down the larynx along the trachea to the large

bronchi; the affection of the former parts generally subsiding as the latter becomes diseased. But it sometimes appears without any signs of irritation, either of the Schneiderian membrane, or of the tonsils or fauces, evidently originating in the trachea or large bronchi themselves, particularly in delicate persons, or in those disposed to coughs, pulmonary disease, and habitual expectoration.

4. A sense of roughness, with frequent attempts to clear the throat, is generally the first *symptom* of the disease. This is accompanied with, or followed by titillation of the larynx, exciting a dry hard cough; hoarseness of voice, with a sense of tightness across the chest, and sometimes slight pain or soreness upon coughing or breathing deeply. Accompanying these local symptoms, more or less constitutional disturbance is generally present. The patient complains of lassitude, pain in the limbs and back, slight shiverings, or cold chills, quickness of pulse, and increased warmth, with dryness of the skin. The cough, which was at first dry, is now accompanied with a slight expectoration of a somewhat saline, glairy, and thin fluid; and as it rises towards the glottis, increases the cough, and renders the fits more frequent, probably owing to its irritating quality; in this resembling the secretion in coryza with which it so often originates. In the slighter forms of the disease, the expectoration becomes in two, three, or four days thicker, more abundant and tenacious, less irritating and somewhat more opaque; and with this change the constriction, pain, and soreness are diminished, or very much relieved; the pulse also is less frequent; the skin cooler and more moist; the urine less scanty, paler, and deposits a sediment; and the cough less frequent, although often in longer paroxysms. As the amendment advances, the sputum decreases in quantity, but is more opaque, tenacious, and deeper coloured, being frequently greenish-white. This amelioration is most remarkable at first in the morning, and, as convalescence proceeds, continues throughout the day. At last but little expectoration takes place, and is observed, as well as the cough, only morning and evening. In slighter cases, the chilliness continues throughout, or alternates with some increase of heat and perspiration; the pulse is scarcely affected unless towards evening; the expectoration is neither abundant nor very viscid; the fits of cough not severe, and chiefly in the night and morning. Such are the usual symptoms and course of catarrhal bronchitis, constituting what is usually named a cold upon the chest. But it sometimes assumes other characters; and then pulmonary catarrh is no more applicable to it than to

inflammation of the substance of the lungs, in which, also, it occasionally terminates.

5. This form of bronchitis appears to consist of catarrhal irritation extending to, or originating in the mucous membrane of the trachea and large bronchi, to which it is chiefly limited, without materially affecting the sub-mucous tissue. It seems not to be actual inflammation, or if inflammatory action be present it is of a peculiar or specific kind, probably owing to its being seated in, or rather limited to, the mucous membrane; in which light it is viewed by HILDENBRAND, who very justly considers catarrhal irritation to be distinct from true inflammation. This variety may assume an epidemic form, when its symptoms become somewhat modified (see INFLUENZA); and repeated or prolonged attacks of it often favour the development of tubercles in the lungs, or even originate them in scrofulous and delicate subjects. It may also pass more or less rapidly into either true acute bronchitis, or into the chronic form of the disease, owing to the extension of inflammatory action more generally through the bronchi, and to their sub-mucous cellular tissue.

6. ii. STHENIC ACUTE BRONCHITIS. — This form of inflammation of the mucous surface of the bronchi, has, from its phlogistic or acute and active character, been called *acute bronchitis*, or *sthenic acute bronchitis*, or *sthenic bronchitis* — *B. acutus*, — *B. acutus verus*, — *B. acutus sthenicus*. It is the *acute mucous catarrh* of LAENNEC. — This more decidedly inflammatory form of the disease is sometimes preceded by coryza of sore throat; and as these begin to yield, the morbid action extends along the mucous membrane to the trachea and bronchi. But it frequently also commences in this last situation, particularly in those who are liable to pulmonary disease, and to chronic coughs, and assumes a severe form. After these preliminary signs, sometimes hoarseness, or loss of voice, and always a dry hard cough, with a sense of soreness, rawness, dryness, and heat, are complained of under the sternum, preceded by marked chills or complete rigors. The chills at first alternate with increased heat and dryness of the skin; and are soon followed by quickened and somewhat laborious respiration; dyspnoea or oppression of the chest; sometimes a dull pain on coughing; quick, full, and often strong pulse; sickness or loss of appetite; pain in the forehead, back, and limbs; loss of animal strength, with an inability to leave the couch or bed; foul loaded tongue; constipated bowels, and scanty high-coloured urine. As the disease advances, the frequency of pulse, the cough, expectoration, and general febrile symptoms, increase, as well as the tightness and soreness of

chest; the latter sensation often amounting to an obtuse pain extending between the shoulders, to the back, and to the attachments of the diaphragm to the false ribs, sometimes with pale anxious countenance, and great oppression and anxiety. As expectoration comes on and increases, the sense of heat below the sternum diminishes. The cough is generally excited by a full inspiration; and from being short and dry, or attended by but little expectoration, becomes longer, more severe, and convulsive, accompanied with a more copious expectoration; and subsequently, in some cases, terminates in scanty vomiting, which promotes the discharge of a watery or serous and frothy mucus, sometimes in considerable quantity, which had accumulated in the bronchi and trachea. The febrile and other symptoms are aggravated towards night, which is generally sleepless and disturbed, the position of the body being on the back; but the posture is often changed. In some cases, particularly those which are not remarkably severe, each exacerbation of the fever is attended by chills; and throughout the disease, the sensibility of the surface to cold is very great. In the more phlogistic cases, especially in plethoric subjects, the dyspnoea and oppression are very urgent, the face is flushed, and sometimes slightly tumid, and the eyes injected. At a still more advanced period, the tongue is often red at its sides and point, and deeply loaded in the middle and base; the breathing becomes rattling or wheezing, owing to the air struggling through the mucous accumulation in the bronchi, and the exertions to expectorate greater. In extreme cases of this description, collapse, with diminished expectoration, purple lips, orthopnoea, quick depressed pulse, cold perspirations and extremities, with threatening suffocation, occur as early as the sixth or eighth day.

7. The chief characteristic of this true form of bronchitis is the state of the *sputum*, which ought always to be carefully examined. When the disease attacks a person who never expectorates whilst in health, the cough remains dry for a considerable time; and those who expectorate habitually, cease to do so when the inflammatory attack is very acute. If the disease be slight, the sputum is often increased from the commencement, and its quality changed. As long as the cough continues dry, the disease may be said to be in its first stage. In the course of a period which varies with the constitution of the patient and the treatment employed, each fit of coughing is followed by the excretion of a clear, transparent, serous or watery mucosity, which is at first slightly saline, but afterwards becomes tasteless. It is without

odour. As the disease advances, it is a glairy mucus, resembling white of egg. When it is poured into one vessel from another it flows with extreme viscosity. The more it can be drawn out into a fine thread, and the greater its tenacity, the more marked is the irritation of the surface secreting it; the greater also being the oppression, heat, and anxiety in the chest, the violence of the cough, and the general febrile symptoms. In these very acute cases, it adheres closely to the sides of the vessel containing it by long striæ. When the fits of coughing are severe, there is a froth or sort of lather on its surface; and, in some cases, it is streaked with a little red blood, which, however, is not combined with the mucus as in pneumonia. Early in the disease, whilst the expectoration is fluid, transparent, or watery, it often contains small whitish flocculi, proceeding from the mucous cryptæ of the pharynx and fauces.

8. In proportion as the inflammation advances to *resolution*, the sputum loses its transparency, and is mixed with opaque, yellowish, whitish, or greenish matter, which increases until it forms nearly the whole of the expectorated mass, and is attended by a marked diminution of the symptoms: its quantity also is lessened. The inspection of the sputa thus not only serves to indicate the nature of the disease, but also its various stages. In cases of a relapse or aggravation of the inflammatory action, the sputum again becomes transparent, frothy, more abundant, and viscid; and the other symptoms increase. In several instances the disease will continue to fluctuate for several days, exhibiting symptoms of slight amelioration, soon followed by slight relapse or exacerbations, often occurring on alternate days, or at the tertian period, and assuming from this circumstance a remittent character, until either a more decided improvement takes place, or a more marked aggravation, terminating in some one of the ways hereafter to be detailed (§ 12 *et seq.*).

9. In the two forms of the disease now described, the minute bronchi so far escape, during the favourable course of the disease, as that no material interruption to the functions of the lungs, in respect of the changes effected on the blood during respiration, takes place in them; the air still passing through them and reaching the air-cells: but, in certain of their very severe forms and complications, and of their unfavourable terminations, and in the variety next to be noticed, obstruction to the free circulation of air, and to the changes produced on the blood in the lungs, occurs to a greater or less extent.

10. iii. ASTHENIC ACUTE BRONCHITIS. — This variety has most commonly been described by former writers as *Bronchitis Asthenicus*, — *Asthenic Bronchitis*, — *Peripneumonia Notha**, — *Acute Suffocative Catarrh*, — *Acute Sthenic Bronchitis*, which latter name I gave it in my first treatise on bronchitis. This variety of the disease generally occurs in very young, or in aged persons, in those of a phlegmatic or cachectic habit, and of lax fibres and exhausted powers of constitution, or who have been liable to chronic coughs, and to copious expectoration of a thin watery phlegm. Severe paroxysms of cough, with wheezing and oppressed breathing; foul loaded tongue: scanty urine; complete loss of appetite; very quick, small, or irregular pulse; little or no increase of heat, excepting at night; cold extremities; vertigo; pain in the head; exacerbating fits of dyspnoea, with a scanty expectoration at the commencement, gradually becoming abundant and frothy; are its chief symptoms in persons advanced in life. It is much less acute or phlogistic in its character than the preceding variety; and its duration is longer. In the more severe cases, the countenance is pallid and anxious; the oppression of the præcordia extremely great; and a full breath taken to relieve it brings on a severe fit of coughing, which sometimes terminates in vomiting, and relieves for a time the symptoms by favouring the excretion of the accumulated mucosities. The tongue is often dry and brownish-red at its point and edges, and sometimes covered at its base with a dark coating; the breathing is much more difficult; the lips and nails assume a blue livid appearance; the face becomes lurid or dusky; the patient cannot lie down in bed, or, if he does, starts up, after falling asleep, with a sense of suffocation; and the symptoms indicate either collapse, and obstruction of the air-passages, or effusion of fluid in the thoracic cavities, or even both: stupor, or sopor; weak, wiry, and very frequent pulse; marked diminution of the sputa, cold extremities, orthopnoea, clammy sweats about the face and neck, suppressed urine, &c., ushering in a fatal termination.

11. This is, upon the whole, the most common form of bronchitis which is met with in *children*, particularly in the metropolis, and among the children of the poor, ill-fed, and ill-clothed, and those living in cellars, ground-floors, and badly ventilated lanes and

* "*Peripneumonia notha* fortior nobis bronchiorum catarrhus est, quo in pituitosis, obesis, senibus, cachecticis, laxisque hominibus frigida et humida sub tempestate, ab accedente membranæ mucosæ hos canales investientis irritatione, copiosior, tenaxque pituita celeriori passu secreta bronchiorum fines opplendo, suffocationem sat cito minatur." (J. P. FRANK.)

apartments, and is often remarkably prevalent during the winter and spring. In this class of patients its approach is often insidious; and it usually commences with coryza, but not infrequently also with chills, febrile symptoms towards evening, wheezing, quick breathing, and cough. There is at first little or no dyspnœa; but the tongue is loaded, the pulse accelerated and full, the face pallid or tumid, and the child has lost its animation. As the disease advances, the breathing becomes more quick and laborious; and fits of dyspnœa come on, generally followed by severe attacks of cough, which often terminate in vomiting; on which occasion only the bronchial secretion is presented for examination, and is found to consist at first of a viscid, watery mucus, and afterwards of a yellowish-white, or a tenacious matter. These exacerbations are followed by remissions, during which the child dozes, and appears relieved, and the pulse becomes less frequent. Thus the disease may continue, with alternate remissions and exacerbations, for many days, until either a permanent diminution of the symptoms takes place, or an increased frequency of pulse, stupor, lividity of the lips and nails of the fingers, convulsions, &c., supervene, and indicate impending suffocation, with congestion or watery effusion on the brain.

12. iv. TERMINATIONS OF ACUTE BRONCHITIS. — *A. Duration.* — The *sthenic* variety of the disease usually runs its course in about seven or nine days; but it may terminate either way as early as the fifth; or it may be prolonged to the 21st, or even the 28th day. Its duration will, however, chiefly depend upon the treatment employed, the complication it may present, the severity of the symptoms, and on the age and constitution of the patient. The *asthenic* form of bronchitis generally runs its course in a slower manner; it seldom terminates in either way in less than fourteen days, and generally continues for several weeks.

13. *B.* In *favourable* cases, the *asthenic* form of the disease begins to decline from the fifth to the ninth day. The change is first evinced by the state of the sputum, as above described (§ 8); by an amelioration of the cough, dyspnœa, and febrile symptoms: in rare instances, by copious epistaxis; by a more general and copious perspiration than that which frequently terminated the febrile exacerbations; by a more copious discharge of a paler urine, depositing a sediment; and by a diminution of the dyspnœa, of the frequency and severity of the cough, and of the quantity of the expectoration, which becomes pearly, opaque, thick, yellowish, or greenish yellow; at last febrile symptoms occur only towards evening, and the disease disappears as in the catarrhal variety.

14. *C.* This favourable change is not, however, always observed, particularly when the attack is very severe, when treatment has either not been soon employed, or has not been sufficient to remove the disease, or when the secretion into the bronchi has been very profuse, and expectorated with much difficulty. In such cases, it either lapses into the chronic state about to be described; or, owing to the extension of the inflammation to the capillary or minute bronchi and to the air-cells and substance of the lungs, gives origin to pneumonitis, and even to pneumonitis combined with pleuritis, which is thus superadded to the original disease; or, from the great extent of surface affected, the consequent irritative fever, and interruption to the pulmonary functions, and the profuse viscid fluid filling up the bronchi, collapse of the powers of life supervenes, and the patient dies, either with cerebral affection, or with the usual symptoms of asphyxy, consequent upon diminished discharge of the morbid secretion, and its accumulation in the air-tubes.

15. *a.* When the disease thus terminates in *pneumonia*, the sputum becomes more rounded, thick, tenacious, and streaked with blood, which is more or less intimately mixed with it; and sometimes of a dark colour, giving it a rusty appearance; and the cough is more tight, hard, and deep. The oppression also increases; the cheeks are flushed with circumscribed red; the pain of the chest is more severe, or is now complained of for the first time; the skin is partially covered with moisture, sometimes very abundant in parts; the chest, which was hitherto sonorous throughout, is dull, in some part or other, upon percussion; and the auscultatory signs of severe and dangerous pneumonia appear, on which delirium and other unfavourable symptoms often supervene, and terminate, with coma, the life of the patient.

16. *b.* Bronchitis, as it occurs either in the sthenic or asthenic form, may also terminate in chronic pleuritis, and in effusion of serum into the pleural cavity, and in some instances also into the pericardium, particularly in persons advanced in life, and in those who have experienced difficulty in the circulation through the cavities of the heart. In some instances of this description, the expectoration, and many of the other symptoms, are suddenly or quickly diminished; but the dyspnoea continues, and signs of effusion become more apparent as those of bronchitis disappear. In these, the consecutive effusion occurs in the form of a translation or metastasis of the morbid action from the mucous to the serous surface. In other cases, symptoms of pneumonitis, or pleuritis,

intervene between the change in the bronchite symptoms, and the occurrence of effusion, with pain, more or less severe, loss of resonance in some part of the chest, and other auscultatory signs, indicating the extension of the inflammatory action first to the small bronchi, and thence to the substance of the lungs and the pleura. Sir C. HASTINGS has detailed some cases of this termination in his work, and I have treated several instances at the Children's Infirmary; but it is chiefly the aged who are liable to this unfavourable occurrence.

16. *c.* In other unfavourable cases, the disease becomes, in the course of a few days, characterised by failure of the energies of life; oppression and uneasiness increase; the cough is more frequent, laborious, and convulsive; the sputum is either more abundant, frothy, tenacious, and glairy, or gelatinous, and excreted with great difficulty, or much diminished in quantity from want of power to excrete it; the pulse is more rapid, small, weak, and irregular, or intermittent; the pain of the head more distressing; the countenance is pale, and the face and neck covered with a clammy sweat; the respiration very frequent and wheezing, sometimes with an audible rattle; and, at last, delirium, lividity, at first of the lips, afterwards of the countenance, great prostration of strength, and coma, supervene, and the patient sinks with all the signs of imperfectly changed blood. In some cases, cerebral symptoms come on much earlier, with either violent or low muttering delirium, which soon terminates in most profound coma. In a few cases, this early accession of delirium, or of violent headache, with other symptoms of consecutive inflammatory action, ending in serous effusion on the brain, altogether removes the original bronchial inflammation, or in others moderates it greatly and masks it. I have observed this in *children*, and once or twice in robust adult persons; but in both classes of subjects it is a dangerous occurrence. More commonly, however, the cerebral symptoms continue increasing, with those referrible to the bronchi, till life is extinguished.

17. In other cases of very acute bronchitis, with very high fever and severe local symptoms, particularly with quick, laborious, short respiration, dyspnoea, anxiety, great sense of heat under the sternum, and bloated countenance, collapse takes place rapidly, particularly if an appropriate treatment have not been early employed; and either delirium, coma, and other cerebral symptoms, or those more directly depending on the circulation of venous blood, appear, and the patient is speedily cut off. In weak and nervous patients, and during unfavourable states of the air, the inflammatory action

sometimes seems to invade nearly all the respiratory mucous surface, and is soon productive of a copious mucous secretion, which, either from its difficult excretion, or rapid secretion, in some cases, speedily suffocates the patient.

18. In *children*, and more rarely in adults, cases occur, in which the inflammatory action extends to the capillary bronchi and substance of the lungs, or causes obstruction or plugging of some considerable bronchial ramification, and consecutively a collapse of the portion of the lung supplied by that branch. In other cases, the inflammatory action commences in the pharynx, larynx, and trachea, and advances to the bronchi, or attacks those parts simultaneously. It more rarely extends upwards from the former to the *trachea* and *larynx*, occasioning all the symptoms of laryngitis in addition to those of bronchitis, and terminating fatally with convulsions and the signs of congestion in the head. In many of the unfavourable cases of bronchitis in children, the extent of the disease, and the copious secretion, occasion suffocation more or less rapidly, with somnolency, bloated or livid countenance, convulsions, coma, and, at last, complete asphyxy: and, on dissection, congestion of blood, with watery effusion, is found within the cranium; the bronchi are filled with a muco-purulent matter, and the vessels of the lungs are loaded with blood. (See in the sequel, "*Of Bronchitis in Children.*")

19. v. COMPLICATIONS OF ACUTE BRONCHITIS.—The most common complications in which bronchitis presents itself in practice, are, 1st, With catarrhal sore throat, coryza, &c., of which it is generally consecutive, and with catarrhal inflammation of the pharynx and œsophagus. 2nd, With tubercular consumption. 3rd, With asthma and emphysema of the lungs. 4th, With inflammation of the trachea, or larynx, or both, of which it is most frequently consecutive; but also sometimes antecedent, as I have occasionally observed in children. Indeed, we have seldom croup in London uncomplicated with bronchitis in some one of its forms or states. 5th, With measles, diphtheria, scarlatina, small-pox, on which it very frequently supervenes, particularly on measles, sometimes very early in the disease, and before the eruption breaks out; but oftener in consequence of its premature disappearance, or retrocession. 6th, Very commonly with whooping-cough, especially during certain seasons and epidemics. 7th, With inflammation of the substance of the lungs, constituting broncho-pneumonia. 8th, With influenza, upon which it very often supervenes and assumes an asthenic form. 9th, Not infrequently with continued fevers,

particularly in its asthenic form. 10th, Often with disorder, or even sub-acute inflammation, of the digestive mucous surface, and diarrhoea, in children, when it also assumes this form; the stools being offensive, and the tongue red at its point, &c.* 11th, With disease of the liver, and accumulations of bile in the gall-bladder, chiefly in adults; the tongue then being very deeply loaded with a yellowish brown crust, or fur: and the stools dark-coloured, and most offensive. 12th, In some cases with erysipelas, particularly its epidemic and infectious form. 13th, With pleuritis, either consecutively of the bronchitis, or simultaneous with it. 14th, With dropsical effusion into the pleura or pericardium, especially in aged persons: and, 15th, With inflammatory irritation in the substance of the brain, or in its membranes, with disposition to effusion,—a complication most commonly met with in children.

20. All these diseases are greatly aggravated, and their danger increased, from being associated with bronchitis; and they frequently terminate fatally by one or other of the unfavourable states which the bronchial affection assumes. Bronchitis thus complicated also presents, in consequence, either a more acute character, or the asthenic form; and, being attended by a more marked disposition to invade the smaller or capillary bronchi and air-cells, or by a more profuse secretion of mucus, and a rapid depression of the vital force, the unfavourable terminations described above quickly supervene. In several of these complications, particularly with pertussis, measles, scarlatina, influenza, continued fever, diseases of the lungs or pleura, cerebral affections, &c., the bronchitis generally assumes an asthenic form, and often escapes detection, until it becomes one of the most important, or the most dangerous, or an actually fatal lesion.

The importance of being acquainted with the most common and the most serious of the complications I have enumerated requires a more particular notice of them. Certain of these complications are noticed as fully as my limits admit, or as the subject requires, inasmuch as the mere mention and recollection of them will suggest a due attention to them on the part of the physician, and at the same time the indications and remedial means which the existing asso-

* During some seasons I have occasionally admitted in one day, at the Infirmary for Children, several cases, in which it was difficult to determine whether the digestive or the respiratory mucous surface was most affected. This complication is not infrequent during convalescence from the exanthemata, particularly measles and scarlet fever.

ciations of disease appear to render necessary, having a due regard to the states of vital force.

21. *A. The complication of tubercular phthisis, and of laryngo-tracheal phthisis with bronchitis*, have been noticed in the *first* and *second parts* of this work; but it is chiefly with the chronic form of bronchitis that these maladies are associated, the acute state being much less frequently observed, and then mainly during an early period of the complication. When we consider the intimate anatomical and physiological relations of the bronchi with the air-cells and substance of the lungs on the one side, and with the trachea, larynx, and pharynx on the other, the surprise should not be that these complications, or rather extensions of morbid action, so frequently exist; but that they should be so often, or even at any time absent. The extensions and limitations of disease in the course of mucous surfaces, and the extension of it to or from other structures, are chiefly under the control of the vital force which also influences, through the secreting and depurating organs, the states of the circulating fluids; and when the vital force is unimpaired and the circulating fluids uncontaminated, inflammatory and other diseases are limited, and their extension is resisted. When this vital resistance is weak and insufficient, these diseases are extended, and hence complications more readily occur.

22. *B. The occurrence of bronchitis with measles* either before, during, or subsequently to, the eruption is often observed, and is one of the most serious complications which can appear in the course of measles, more especially when this eruptive fever is epidemic. The severity and danger of this association are the greater, inasmuch as the inflammation of the bronchi, which is most frequently of an asthenic character, is much disposed to extend to the capillary ramifications and thence to the lungs, and thus develope asthenic broncho-pneumonia. Moreover, this complication may not only appear in the course of, but also during, convalescence from measles.

The more inflammatory and sthenic form of measles is so very frequently complicated with *bronchitis* or *broncho-pneumonia*, or is so liable to be followed by those diseases, or even by pneumonia or pleurisy, during convalescence, that strict attention should be paid to these occurrences. When extensive or severe bronchitis appears in the course of the more sthenically inflammatory forms of measles, the patient is often suddenly seized with great difficulty of breathing; the face is pale, if it precede the eruption, but generally somewhat livid, or even of a deep crimson, if it occur

during the eruption. Sometimes the eruption either appears only partially, or recedes prematurely; the lips are also livid; the chest and diaphragm, as evinced by the motions of the abdomen, labour much during respiration, and a sonorous, sibilous, and, lastly, a mucous rhonchus is heard on auscultation. The countenance becomes anxious; the expectoration is more or less abundant, and attended by severe paroxysms of cough; the pulse is quick, small, or oppressed; and the skin is warm or cool in parts only. This state is not merely a severe form of bronchitis, but an association of it with congestion of the lungs, to which a similar state of the brain is sometimes superadded. The pulmonary affection, in this severe form, may soon terminate the life of the patient, chiefly in consequence of the effusion which takes place in the air-passages, together with the loaded state of the vessels of the encephalon.

In the less severe forms of the complication of bronchitis with measles, or when the bronchitis is not conjoined with congestion of the lungs, the symptoms are much less marked and severe; there is less urgent oppression in the chest, and the lividity of the countenance is generally absent. But these less severe states of bronchitis not infrequently superinduce inflammation of the capillary bronchi, extending to the substance of parts of the lungs or of a whole lobe. In this case the sputum becomes more rounded, and sometimes streaked with blood; respiration is puerile in the vicinity of the affected part, in which the respiratory murmur is either feebly heard, or is attended by crepitation, or the sound is no longer detected in it, whilst the chest is dull, in this situation, on percussion. At the same time the respiratory motions are quick, laboured, unequal, and imperfect.

23. When thus complicated with *measles* or other *exanthematous diseases*, the eruption, if it still continue on the surface, often assumes, as the powers of life sink, a dark or purplish hue; or a slight dirty blueness of the skin, particularly of the face and hands, is generally observed, indicating the impeded functions of respiration, and the consequent changes in the blood. The frequency and importance of the *complication* of bronchitis with *measles*, or with other eruptive or continued fevers, especially before the eruption, during its progress, and after its decline; and the occurrence of bronchitis both during and after convalescence from these maladies, especially measles, and other epidemic diseases, are deserving the careful attention of the physician.

24. *C. Bronchitis is frequently associated with whooping-cough*

during some epidemics, and especially in spring and winter, and particularly in this climate in the months of February, March, and April, and during the prevalence of easterly or north-easterly winds, and when pertussis follows soon after measles.

1. Bronchitis may precede hooping-cough; 2. It may be coeval with it; 3. It may supervene in the course of the disease. The last is most common. Whenever bronchitis appears, there are always decidedly febrile symptoms during the intervals between the paroxysms of cough. The breathing is also much accelerated, and when examined by auscultation is accompanied by the mucous rattle, and occasional temporary suspension of the respiratory sound in parts of the lungs, owing to the accumulation of the mucous secretion for a while in one or more of the bronchial tubes conveying air to those parts of the organ. The expectoration also, from being clear, whitish, and ropy, becomes more opaque, less fluid, gelatinous, and less abundant. The paroxysms of cough are much more frequent, and often accompanied with a feeling of oppression in the chest, and are less constantly followed, or even not at all, by rejection of the contents of the stomach. The chest sounds well upon percussion, and the patient lies on the side most affected, or in slighter cases on either side. When the bronchi of both lungs are generally affected, he is unable to lie on either side, or is incapable of lying down at all.

25. This complication often terminates fatally, either from obstruction of the air-tubes by the accumulation of tenacious mucus, and collapse of portions of the lungs, owing to occlusion of these tubes, together with spasm about the larynx, occasioned by the nervous character of the disease, and the irritation of the glutinous secretion, the patient dying asphyxied; or from congestion of the vessels of the head, owing to the paroxysms of cough, the obstruction produced by the mucus in the air-passages, and the difficult circulation through the lungs; or from the inflammatory action having extended either to the trachea and larynx on the one hand, or on the other to the minute bronchi and substance of the lungs, terminating in condensation, &c., of the structure of the organ, &c. In some cases, owing to the treatment employed and constitution of the patient, the acute form of the bronchial affection gradually subsides until it arrives at a milder state; when, owing to the incapability of the vessels to assume the healthy state, a chronic form of disease continues long afterwards, which may be removed, in some cases, by judicious management; but which terminates in ulceration of the mucous membrane, or gives

rise to tubercles, to chronic pneumonia or pleuritis, or other lesions in the thoracic cavity. This complication is frequent from six or seven months upwards, and especially during the second, third, and fourth years of age.

26. *D. Bronchitis was one of the most frequent and severe complications of Influenza*, observed in the two great epidemics of this latter disease in 1833 and 1837. But it was very different from the sthenic acute bronchitis usually observed as a primary malady, or as occurring in previously healthy persons. It was attended, in many cases, with more marked vital depression, with a more copious expectoration of a greyish, viscid, ropy, and less frothy mucus, which often quickly passed into a thin, muco-puriform matter, than in idiopathic bronchitis. In most of the cases both lungs were more or less affected, and the disease rapidly extended, especially when injudiciously treated, to the capillary ramifications of the bronchi, until, in the dangerous or fatal cases, the air-cells themselves became implicated.

At the commencement of the bronchitic complication the cough was hard, dry, and severe; but expectoration soon became abundant, the wheezing from the accumulation of the morbid secretion in the bronchi being often remarkably loud, the cough and the quantity of the sputa were generally increased at night, the former being frequently so severe, and the attendant dyspnœa so urgent, as to prevent the patient from lying down in bed. When both lungs were gravely affected, the patient was obliged to sit, or be shored up by pillows. In some cases the sputa were remarkably abundant, consisting of a very fluid muco-puriform matter, almost from the commencement.

In most of the bronchial complications, the *dyspnœa* was considerable, and especially when expectoration was difficult and the sputa copious: still it was often great when the discharge from the respiratory passages was neither abundant nor difficult. The rapid extension of the asthenic form of bronchitis throughout both lungs was most remarkable in the delicate, in the aged, the cachectic, and in those subject to asthmatic or bronchial disorder. In some instances, it quickly superinduced a nervous or asthenic form of pneumonia or pleuro-pneumonia, with which it further became associated; and occasionally it seemed to have given rise to more or less emphysema of the lungs. The mucous or crepito-mucous rhonchus was generally heard in most of these cases. The pulse was commonly upwards of 100, and often above 110 or even 120, and often irregular or intermitting. The severer states of this

complication often terminated fatally, owing to the quantity of the morbid secretion filling the smaller bronchial ramifications, infiltrating the air-cells, or even the areola of the connecting cellular tissue, and thus occasioning asphyxia.

27. *E. The complications of Bronchitis with pneumonitis* are more common than the pure or unassociated form of either of these, and are met with in both the sthenic and asthenic types of these diseases; the latter types, however, more generally presenting the complicated state. This association, consisting of *broncho-pneumonia*, or *broncho-pneumonitis*, is more common than generally supposed; for the asthenic form of pneumonia can hardly exist without the capillary bronchi being implicated, and the inflammation, which is primarily seated chiefly in the larger bronchi, in sthenic bronchitis, readily extends to the capillary ramifications, in delicate, scrofulous, or cachectic constitutions, more especially when exposed to depressing influences, and when bronchitis appears in the course of exanthematous or continued fevers, and during the epidemic or endemic prevalence of diseases of the respiratory passages. When bronchitis is complicated with pneumonia it is sometimes of importance to mark the procession of the morbid phenomena, in order to ascertain the primary affection. In the great majority of instances, the bronchi are primarily affected, the morbid action extending thence to the parenchyma of the lungs, owing either to the nature of the causes, to the constitution and existing state of the patient, or to the treatment adopted at the commencement. I have observed, in numerous cases, particularly among the children of the poor, living in low, damp, and close situations and rooms, sleeping in overcrowded apartments, and insufficiently or unwholesomely fed and clothed, that the disease has commenced in the bronchi, extended to the air-cells and substance of the lungs, and thence to the pleura, with great rapidity. In this complication the quantity of mucus in the bronchi may mask the crepitation of pneumonia. Still crepitation will generally be heard in the inferior and posterior regions of the chest, whilst the mucous rhonchi will be evident in the more superior parts. The rusty or tinged appearance of the sputa, as the disease proceeds, the dulness on percussion, the increased dyspnoea, the greater severity and more paroxysmal character of the cough, will also mark this association.

28. *Broncho-pneumonia* very frequently supervenes in the course of *Influenza* (§ 26). It was common, and fatal in the influenza of 1837, particularly when it implicated, as it very often

did, both lungs. In this epidemic the pulmonary affection generally assumed the asthenic form, the pulse being weak, quick, and small, the cough being severe, puriform expectoration abundant, and dyspnœa distressing; and in proportion to the vital depression the most energetic means were required to rouse the vital resistance to the extension and fatal tendency of the disease. Broncho-pneumonitis is also frequent in the course of *hooping-cough* (§ 24), and in the more unfavourable forms of *croup*; but, in these, it assumes a more sthenic character than in influenza. It also occurs in the course of *cardiac disease*, particularly when the valves are affected, and in connection with *hæmoptysis*; but, in these circumstances, it presents much of the congestive form.

The bronchitis which so very generally complicates *measles* (§ 23) passes very frequently into broncho-pneumonia, although the pneumonia may be the chief affection. In all cases of this association, the pulmonary disease partakes of the constitutional malady, being sthenic, asthenic, or malignant, as this latter may be. When the local disease is severe, it is readily recognised, as it is commonly attended by an imperfect evolution of the eruption, or it follows immediately upon either the premature or the regular disappearance of it; the fever or constitutional disturbance being unabated or increased.

The *peripneumonia notha* of the older writers was generally a broncho-pneumonia occurring in aged, cachectic, or debilitated persons, in whom the disease assumed, from these circumstances, more or less of an asthenic form, and extended to both lungs; but the same term was often also applied to other states of bronchitis, and even to asthenic pneumonia, with extension of disease to the pulmonary pleura.

29. *The asthenic form of acute bronchitis, or acute capillary bronchitis, the acute suffocative catarrh*, although often occurring primarily in very young, delicate, cachectic, and ill-fed *children*, especially in low, crowded, and unhealthy localities, is quite as frequently seen as *complication* of eruptive and continued fevers, of hooping-cough, of influenza, &c., or as supervening upon these either during their decline, or during convalescence from them. When thus complicated, asthenic acute capillary bronchitis may assume the states described above (§§ 27, 28); but it may be more or less varied as respects its symptoms and the rapidity and character of its terminations, with the circumstances in which it appears, or with the nature of the disease with which it is associated, or upon which it supervenes. It generally, especially

when thus complicated, terminates fatally, owing to both lungs being affected, and to the extension of the mischief not merely to the capillary bronchi, but also to the air-cells and substance of the lungs, which often becomes collapsed or carnified. In these cases, the pulse is rapid, small, weak, &c., the face and fingers become livid and cold, and somnolence, coma, and asphyxia supervene.

The remarks now offered respecting the most frequent complications of bronchitis, and the mere enumeration of others of more rare occurrence, will be sufficient to direct attention to the practical importance of the subject. The association of bronchitis not only with the exanthematous fevers, but also with continued fevers at certain seasons, and in some epidemics, will also frequently engage professional attention.

30. vi. SUB-ACUTE BRONCHITIS.—It is often difficult to determine the grade of severity which may exist in an attack of bronchitis, or whether it present an asthenic or sthenic character on its first appearance. Very early in the disease an acute attack may rapidly assume a mild or sub-acute form, or the sthenic character may soon pass into the asthenic, owing either to the causes, the diathesis of the patient, or the influences and treatment to which he has been subjected. In most of the cases of sub-acute bronchitis which I have observed, especially in the *children* of the poor, and in those which were brought before me in the patients at the Infirmary for Children, the complaint presented a sub-acute form from the commencement, and often could not be distinguished from a common catarrh. After a period of varying duration, the cough becomes more and more severe, and is sometimes followed by retching or vomiting; the complaint being frequently then mistaken for whooping-cough. Respiration is frequent, wheezing, or irregular; fever supervenes, with flushed face, accelerated pulse, and heat of skin. As the mucous secretion increases the cough becomes more paroxysmal and looser, and the respiration, which was at first tight or oppressed, more wheezing and laboured. When the paroxysm of cough terminates in vomiting, mucus, in varying quantity, is thrown off, and much relief is experienced for a time, until it again collects. If the cough be not followed by vomiting, and if the child be not old enough to expectorate freely, the mucus is swallowed. In most cases the tongue is moist, and the respiration, cough, and fever are, for several or even for many days, without much alteration; the symptoms, especially the fever, being

aggravated towards evening or night; and, when sleep is procured, perspiration takes place: upon awakening, the respiration is much oppressed until the cough dislodges the accumulated mucus. Auscultation detects only the mucous or sibilous respiration, with large or moist crepitation in the lower and the posterior regions of the chest.

31. As the disease continues or becomes aggravated, particularly in children, and as the vital force becomes exhausted, the capillary bronchi are liable to obstruction from the tenacity and quantity of the mucus secreted, and from the vitality of the ciliæ of the mucous surface being insufficient for the conveyance of the secretion along the smaller to the larger bronchi, some of which may also be obstructed, and the portion of lung which they supply may thus either collapse or be carnified by the accumulation in the capillary bronchi, and by the accompanying vascular congestion. When these changes occur, dulness on percussion, and absence or weakness of the respiratory murmur, are more or less manifest. In some cases of sub-acute bronchitis the symptoms are merely of a milder character than in the sthenic and asthenic forms above described (§§ 6—11), and the duration of the disease is not so protracted, although, when the case is neglected, it may be even more prolonged than the acute.

32. Other cases of sub-acute bronchitis are characterised by the symptoms of the sthenic form of the disease (§§ 6—9) in a milder and more chronic form. The cough continues longer dry, and the expectoration scanty, or thick, viscid, gelatinous, or albuminous, or almost membraniform, with tightness, oppression, or uneasiness in the chest, and difficult breathing. In some cases of this form of the disease, a plastic albuminous exudation forms on the surface of the lower part of the trachea and of the large bronchi of only one lung, and is moulded in a tubular form, and in the shape of the air-tubes, and is expectorated either in fragments, or in large tubular branches and ramifications. Cases of this description are described by the older writers under the appellation of bronchial polypi, and figures are given of them by TULPIUS and others. I have met with several cases where this bronchial exudation was expectorated in fragments, some of which presented a branched and tubular form. It was observed in uncomplicated cases of sub-acute and chronic bronchitis; or in states of the disease that appeared intermediate between these conventional forms. The cases which I had an opportunity of observing recovered.

The diseases above mentioned as being frequently complicated with acute bronchitis, often are attended by a milder form of the bronchitic affection, which generally assumes a *sub-acute*, or even a *chronic character*. This is especially observed in the course of tubercular consumption, of asthma, of whooping-cough, of chronic pleurisy, in all of which the *bronchial complication* is even much more frequently chronic than acute. (*See Chapter Second.*)

CHAP. II.

DESCRIPTION OF CHRONIC BRONCHITIS.

IN few diseases may the terms acute, sub-acute, and chronic, be more truly viewed as conventional than in Bronchitis, the one form often passing insensibly into the others;—the acute lapsing into the sub-acute and chronic, more or less rapidly or even slowly; and, in other cases, although much less frequently, the sub-acute or chronic, owing to exposures or other causes, assuming an acute or active form. In most cases, however, of chronic bronchitis, the duration of the disease is such as fully justifies the term, and in some its most protracted acceptance.

33. *Chronic bronchitis* often follows severe attacks of catarrh; and is also frequently consecutive of acute bronchitis; but it sometimes occurs primarily in the chronic state, particularly in aged persons. It differs in nothing from the acute or sub-acute forms, excepting in as far as the symptoms are altogether milder, and their continuance longer; there being no distinct line of demarcation between its grades of activity and chronicity. The chief means by which we are enabled to infer that the disease has assumed a chronic form, when it is consequent on the acute, is the continuance of the sputum for several days, in undiminished quantity, and the persistence of the opaque, whitish yellow, or yellowish green appearance, which it assumed upon passing from the transparent, fluid, and viscid condition characterising the acute form.

34. Chronic bronchitis assumes various grades of severity, and presents different phenomena, according to the changes which have taken place in the bronchi. In its *slighter states*, and primary form, as it is often met with in persons advanced in life, and as it

prevails during winter and spring, or variable seasons, it consists chiefly of a frequent and almost habitual cough, with scarcely any pain in the chest, continuing for weeks, or even months, or recurring every autumn, winter, and spring; being most severe in the mornings, and much easier through the day, with slight dyspnoea on exertion, and copious viscid mucous expectoration; but without any marked febrile symptoms, excepting slight acceleration of pulse. Its *severer forms* are met with in young or middle-aged persons, after catarrh or acute bronchitis; and are attended with fits of coughing, and copious expectoration; with oppression at the chest and præcordia; with febrile symptoms, particularly towards night; with copious perspirations in the morning, which often seem to increase the cough instead of relieving it; with loss of strength, emaciation, and slight disorder of the digestive organs. The cough is increased after getting into bed, and very early in the morning. The breathing is quick and laborious, particularly on any exertion; and the patient complains of slight tightness of the chest. The pulse generally ranges from 90 to 120; being the former whilst quiet in bed, and the latter towards evening.

35. Attention to the *expectoration* is very important, in order to enable us to judge both of the accession of this state of the disease, or of its aggravation or change into the acute form, which is not infrequent, and of the concurrent or consecutive alterations which often take place. The sputum occasionally continues long in the state now described. It is generally then inodorous, and without taste. But it oftener becomes greenish or yellowish white, or muco-purulent; is mixed with a colourless watery phlegm, and is more or less abundant. In cases of a worse character, particularly when hectic symptoms are present, it assumes a more purulent appearance; is sometimes streaked with blood, or mixed with dark specks of blood, or consists chiefly of pus. These changes, however, seldom occur without much antecedent fever, and attendant emaciation, night sweats, occasional diarrhoea, and the symptoms of confirmed hectic. In rarer cases, the sputum becomes remarkably foetid; but this change cannot be imputed to any particular lesion of the bronchi or lungs, excepting sometimes to considerable dilatation of the former. The whole of the symptoms in this class of cases so very nearly resemble tubercular consumption as to be distinguished from it with much difficulty, and only by attending to the appearances of the sputum, and by examining the chest with the stethoscope.

36. The *sputum* generally partially swims on the surface of

water. When it is thin, transparent, viscid, and frothy, it usually altogether swims; but when it is thick, in tenacious, opaque lumps, or in fragments resembling portions of albuminous exudation, it generally sinks. In all these states it cannot be diffused in the water. When it consists of yellowish white, or greenish yellow matter, it partly sinks, and by agitation is broken into ragged portions, and is partially diffused; and the more it approaches a purulent state, the more completely and readily is it diffused, imparting to the water, by agitation, a yellowish white appearance.

37. Chronic bronchitis is sometimes *consecutive* of the eruptive diseases; but these diseases have generally altogether or very nearly subsided before the bronchial affection supervened. It occurs primarily from the irritation of minute particles of mineral or vegetable substances floating in the air, as is shown in the sequel. It is sometimes also *complicated* with other chronic diseases of the lungs and pleura, more especially with *tubercles*, with *asthma*, with *hooping-cough*, with organic diseases of the heart, with congestion of the lungs, with chronic inflammation, or other disorders of the mucous surface of the digestive tube; particularly of the œsophagus, stomach, and large bowels. In all these consecutive and complicated states, it presents no certain or unvarying forms; its chief character, its duration, progress, and termination, being modified by its severity, by the constitutional powers of the patient, by his diathesis, by the nature of the complication, and by the quantity of expectoration. In some protracted cases, the secretion from the bronchial surface is so profuse as to be the chief cause of the exhaustion and death of the patient.

CHAP. III.

THE DIAGNOSIS AND PROGNOSIS OF BRONCHITIS.

i. OF THE DIAGNOSIS OF BRONCHITIS.

THE characters of the cough, and of the sputa, the physical signs, and the constitutional symptoms are our chief guides in the diagnosis of bronchitis. The history I have given of the disease will be generally sufficient to enable even the inexperienced to recognise it: but it will often be necessary to arrive at more precise

information as to the extent of lesion, and its existence either in a simple or in a complicated form.

38. *A. Of acute Bronchitis.*—*a. By auscultation.*—In the first stage of the disease, the inflammation causes tumefaction of the mucous bronchial surface, and consequent diminution of the calibre of the tubes. This state occasions a modification of the respiratory sound in them: and, hence, either with the unaided ear, or with the stethoscope, we hear at first the “*dry bronchial rhonchus*,” consisting chiefly of a sibilous or whistling sound; occasionally with a deeper tone, resembling the note of a violoncello, or the cooing of a pigeon, particularly when the large bronchi are affected. These sounds, denominated the *sibilous* and *sonorous rhonchi*, are present chiefly in the early stage, and before expectoration takes place; and prove the accuracy of the rational inference of Dr. BADHAM, that the difficult breathing of this period is owing to the state of the mucous membrane; and I would add, of its sub-mucous cellular tissue also. To these sounds is added the *mucous rhonchus*; and in proportion as the bronchial secretion, to which it is owing, augments, this sound becomes predominant. When the inflammation is seated in the large tubes, the bubbles of mucous rhonchus are large and uneven; and the respiration may be still heard over the chest. But when the mucous rhonchus is fine, and is heard constantly, it may be inferred that the small bronchi are invaded. When this is the case in a severe degree, there is also slightly diminished resonance of the chiefly affected part upon percussion. As the disease proceeds, and the secretion passes into an opaque and thickened state, the mucous rhonchus becomes interrupted, sometimes with obstruction of the respiratory sound in a portion of the lungs, and passes into a sibilant or clicking sound. These changes arise from the entire or partial obstruction of one or more tubes by the thickened mucus, and are generally of temporary continuance; occurring now in one part of the chest, and disappearing; and now in another. This state of the bronchi fully explains the dyspnœa of this stage.

39. *b. Rational Diagnosis.*—*a.* The *cough* in *bronchitis* is loose, diffused, and deep; in paroxysms, and attended with fever, often with wheezing. In *pertussis*, it is in severe paroxysms, unattended by fever or wheezing; is accompanied with a distinct whoop; and terminates in vomiting. In *croup* it is sonorous, clanging, and harsh. In *laryngitis*, it is suffocating, shrill, or grunting; and, on inspiration, attended with a drawing down of the *pomum Adami* to the sternum, and retraction of the epigas-

trium and hypochondria. In *pneumonia*, it is deep in the chest; frequent and short, often hard; and gives a metallic sort of noise. And, in *pleuritis*, it is short, dry, hard; sometimes slight, but always suppressed and painful.— β . The *expectoration* in *bronchitis* is abundant after the second or third day, or even from the first; in *pertussis*, it only follows the vomiting: in *pneumonia*, it is more rounded, distinct, thickened, purulent, rusty, and intimately streaked with blood: in *pleuritis*, *croup*, and *laryngitis*, it is scanty, thin, frothy in the latter; sometimes with shreds or pieces of lymph, and entirely different in appearance from that of *bronchitis*.— γ . *Pain* in *bronchitis* is scarcely complained of; and consists merely of a sense of soreness, heat, and tightness in the chest, particularly beneath the sternum, and is not increased on full inspiration: in *pneumonia*, it is more marked, especially in certain parts of the chest, generally nearer the lateral regions, and is increased on inspiration or prolonged expiration: in *pleuritis*, it is very acute, and a full inspiration is impossible: in *croup* and *laryngitis* the pain is increased upon pressing the trachea and larynx.— δ . The *countenance* in *bronchitis* is more frequently pallid or bloated: in *pneumonia*, it is generally flushed; and dyspnoea is greater in the former than in the latter. The breathing is *wheezing* and *hurried* in acute *bronchitis*; in *pneumonia* it is less so, and generally without the bronchial wheeze. The *pulse*, in the former, is frequent, full, free, developed, and soft; in the latter, full, hard, bounding, or vibrating, and sometimes oppressed and undeveloped. The general febrile symptoms are more continued in *pneumonia* than in *bronchitis*; morning remissions, with free perspiration, being more frequent in the latter than in the former. The *physical signs* in *pneumonia*, *pleuritis*, &c., are the surest means of their diagnosis.

40. Some cases of *asthenic bronchitis* may be mistaken for *humoral asthma*; and occasionally no very distinct line of demarcation can be drawn, both affections either insensibly passing into each other, or being complicated with one another. But, generally, the slow accession of the former, the more continued and less urgent dyspnoea and tightness of the chest, and the presence of febrile symptoms, particularly great quickness of pulse, will distinguish it from *humoral asthma*; which is commonly characterised by the sudden accession of the paroxysms, their severity during the night, and the attendant orthopnoea, the more or less complete and prolonged intermissions, and especially by the absence of fever, and by the much more marked integrity of the vital and animal powers than in *asthenic bronchitis*. In this latter disease, the

patient is incapable of leaving his bed or his apartment: in asthma he may attend to his avocations; or may, at least, change his room in the intervals between the fits. The diagnosis between the *sthenic* bronchitis and asthma is attended with no difficulty.

41. *B. Diagnosis of Chronic Bronchitis.*—*a. By auscultation.*—The physical signs of this form of bronchitis are not materially different from the acute. The respiration is extremely varied: being sometimes louder, at other times more obscure than natural, and generally accompanied with the *mucous rhonchus*; which, however, is not heard over the chest, but now chiefly in one part and then in another, and seldom during the whole of the respiratory act. The occasional occurrence of the *sibilous* and *sonorous* rhonchi indicates that the tubes are sometimes partially obstructed; but this is much less frequent than at the commencement of acute bronchitis; and it rarely happens that the respiration is entirely interrupted in a part of the lung. Very often, also, when the dyspnoea is considerable, or even urgent, the air is heard to enter the lungs as well as usual, the respiratory sound being either distinct or puerile. The resonance of the chest on percussion is scarcely diminished. When the bronchitis is very chronic, the tubes sometimes become *dilated*, from being weakened by the inflammation and strained by the paroxysms of coughing. When this state of the bronchi exists, the sputum is often foetid, and several of the auscultatory signs of tuberculous excavations of the substance of the lungs are present. If the dilatations be large and rounded, it may furnish *pectoriloquy* and the *cavernous rhonchus*; but if, as is more generally the case, it extend to several tubes, or if they be dilated along a considerable portion of their axis, a loud *bronchophony* is only heard. If this dilatation be extensive, bronchophony, bronchial respiration, sometimes with a "*veiled blowing*," and even slight pectoriloquy, will be heard in corresponding parts of the thorax. On *percussion*, the sound is often somewhat less than natural, owing to the compression of the surrounding pulmonary tissue; and owing, also, to this cause, the dyspnoea is often great. Dilated bronchi remain long stationary; tuberculous excavations generally increase rapidly. The former are most frequently situated in the scapular, mammary, and lateral regions; the latter in the sub-clavian and sub-acromian regions of the chest. (See the diagnosis in *Tubercles in the LUNGS*.)

42. *b. Rational diagnosis.*—It is chiefly with tubercles in the lungs that chronic bronchitis is liable to be confounded; and, indeed, without the aid of auscultation, the diagnosis between them

is very difficult. When they both co-exist, and especially when the latter is attended with dilatation, we have seen that even auscultation does not easily enable us to ascertain the exact state of disease: however, by a careful comparison of the physical and rational symptoms of both, we may generally form a tolerably correct opinion. Early in chronic bronchitis, the absence of pain during inspiration, the capability of resting on either side, the pallidity of the lips and countenance, the appearance of the sputum (§§ 34, 35), and the wheezing noise on respiration, may readily distinguish it from tubercular phthisis. As the disease advances, the symptoms more nearly resemble tubercular consumption; but the pallor of countenance and absence of pain generally continue; or, if the latter be present, it is diffused over the chest, and the patient can draw a larger volume of air into the chest, and retain it longer, than in phthisis. The dyspnoea is less on exertion, consists more of a stuffing sensation, and is more relieved by expectoration; the sputum generally consists of a more considerable portion of mucus, and is more regularly abundant; and the perspirations are much more partial, the emaciation less, and the paroxysms of hectic much less regular, than in tubercular disease. The cough is very different. In chronic bronchitis, it is generally deep and sonorous, and in paroxysms; in phthisis it is short and tickling. When we find copious purulent expectoration, but without broken-down portions of softened tubercles or of the pulmonary tissue; night sweats; hectic fever; with full deep cough, and absence of the physical signs of phthisis;—if, after repeated examinations, there can be detected neither a constant absence of the respiratory murmur, nor gurgling cavernous rhonchus, nor pectoriloquy, nor marked defect of resonance on percussion,—we may safely conclude the disease to be chronic bronchitis. When this disease depends upon the inhalation of irritating substances, especially the mineral, vegetable, and animal molecules, and more particularly those to which sculptors and several classes of labourers are exposed, the cough and copious muco-purulent expectoration often continue for months, or even years, without much suffering, with pale countenance, slight lividity of the lips, &c. In these cases there can be no difficulty in the diagnosis. (See the Causes and Prevention of Bronchitis at §§ 49, 71, pp. 375 and 387; the remarks on “Arts and Employments” in the *Dictionary of Practical Medicine*, vol. i. p. 122.)

43. It may be remarked in general, as regards the *physical diagnosis* of uncomplicated bronchitis, that *percussion* affords only a negative sign, at least no direct sign, further than that it may be

attended by more or less dulness, according to the amount of accumulation of mucus in the bronchi of the lower parts of the lung, to the existence of occlusion by mucus of the smaller branches, and to collapse, or carnification, or infiltration of a portion of lung. Bronchitis of the larger bronchi, unless thus accompanied, is not attended by dulness on percussion; if such dulness be present, it is caused by the changes now stated, or by some other lesion of the parenchyma of the lung, or by disease of the pleura and its consequences. Bronchitis may even exist with much effusion of mucopuriform matter in the larger bronchi, and yet no dulness on percussion be perceived. A distinct vibration is often felt on application of the hand over the parietes of the chest consonant with the motions of respiration.

The modifications of the respiratory murmur heard on auscultation in bronchitis, are owing to either of the following mechanical causes:—1st. To turgescence or congestion of the mucous membrane;—2nd. To the resistance of mucous or mucopurulent secretions; and 3rd. To the existence of spasm, which, however, can hardly be inferred unless when bronchitis is complicated with asthma. Generally the more intense the mucous, sonorous, or sibilous *râles*, or combinations of them, during respiration, the more severe the bronchitic attack may be considered: but when the minute or capillary bronchi are affected, the sounds during respiration are not measures of the intensity of the disease, and they become louder only upon the decline of the disease. During the period of secretion from the inflamed surface of the bronchi, the mucous *râle* may occur with large and distinct bubbles, or pass into an almost crepitating character, the sounds on percussion being clear.

When a considerable branch or branches of the bronchi become obstructed so as to prevent the entrance of the air, it may be inferred that the obstruction is owing to one or more of the following changes:—1st. To vascular congestion of the mucous surface or surrounding tissue;—2nd. To greater consistency or tenacity of the morbid secretion;—3rd. To deficient vital influence or force of the mucous ciliæ of the bronchi which promote the course of the mucous secretion from the smaller to the larger bronchi. When the obstruction arises from one or more of these changes, diminution or absence of the respiratory murmur may be temporary or permanent, according to the duration and association of these changes. But although the respiratory murmur may be altogether absent, clearness on percussion may continue for a time. If, however, the obstruction be permanent, more or less dulness will supervene,

owing to the collapse or other changes of that portion of the lung which is supplied by the obstructed bronchus or bronchi. If, in a case of bronchitis, dyspnœa suddenly occurs with diminution of the respiratory murmur in some portion of lung, this portion at first preserving its sound on percussion, although probably losing its sound on percussion subsequently, especially if the obstruction continue, we may infer that obstruction of a bronchial tube or tubes has been caused as above explained, and especially by the morbid secretion therein accumulated.

ii. PROGNOSIS OF BRONCHITIS.

44. *A. Prognosis of Acute.*—When the disease is slight, or limited to a few bronchi only, it generally terminates favourably. The change is indicated by a more perfect apyrexia in the mornings, less severe and less frequent cough, easier expectoration, and a thicker and more opaque sputum; which, however, generally assumes a more fluid and glairy appearance for a few evenings during the febrile exacerbation. A *relapse* of the disease is indicated by increase of the fever and cough, and a more transparent fluid and glairy expectoration. When the inflammation is very severe and general, as indicated by high fever, dyspnœa, &c., the prognosis should be unfavourable, or given with caution. If symptoms of collapse have appeared, and the mucous rhonchus be heard universally, and with little or no respiratory murmur upon auscultation; if the pulse become very frequent, small or weak, irregular or intermittent; and if the countenance be at the same time pallid and anxious, slightly livid, or the nails of the fingers, and lips, tending to purple; the danger from asphyxia is extreme. When the disease occurs in the course of continued or exanthematous fevers, in some epidemic states of whooping-cough, and in the other severe forms of complication (§ 19 *et seq.*); and when the signs indicating the unfavourable *terminations* already enumerated appear, the danger is also great, although it may not be extreme. The supervention of pneumonia or pleuritis, or of tracheitis or laryngitis; a sudden diminution of the expectoration; the occurrence of cerebral symptoms, of orthopnœa, or even continued dyspnœa, with expansion of the nostrils; a dark red colour of the tongue; are all unfavourable circumstances, and indicate imminent danger. On the other hand, when spontaneous evacuations occur, with a favourable change in the cough and expectoration, particularly on one of the critical days, although the attack has been extremely severe, a favourable result may be looked for,

more particularly if the disease proceeded from cold, and was uncomplicated.

45. The *asthenic* form of the disease is very dangerous, when occurring at the extremes of age; but less so when it is unattended by marked depression of the powers of life, and by signs of the circulation of venous blood,—circumstances which, in connection with the frequency, weakness, and irregularity of the pulse, the quantity and appearance of the sputa, and with the difficulty of expectoration, constitute the danger.

46. *B. In the sub-acute and chronic.*—If it have arisen from catarrhal affection, and be unattended by much emaciation or hectic, this form of the disease will generally terminate favourably, although the expectoration present a puriform appearance. The more purulent, however, this excretion, and the more marked the symptoms of hectic, the greater the danger. But when the sputum seems to consist chiefly of mucus, although the quantity expectorated be great, a favourable issue may take place: and this will be more frequently the case when the chronic bronchitis has been consecutive of the acute. When there are constant dyspnoea, very frequent pulse, profuse sweats, and copious purulent expectoration, with emaciation, hectic fever, colliquative diarrhoea, associated symptoms of disease of the liver, or of the mucous surface of the bowels, with a smooth, glossy, or chopped, a dark red, or raw appearance of the tongue, a most unfavourable prognosis should be given; and if to these succeed aphthous eruptions about the mouth and tongue or fauces, little hope of recovery can be entertained. The causes and complications of the disease should also materially influence our prognosis. When it has arisen from mechanical irritation of the bronchi, patients often recover from a very unfavourable state, when the irritating cause has altogether been removed. The occurrence of bronchitis in the scrofulous diathesis, and its association with tubercles in the lungs, are dangerous circumstances. This *complication* is to be ascertained chiefly by means of the physical signs. If these indicate the existence of tubercles, or do not establish with certainty their absence, a very cautious opinion should be given. The mucous rhonchus, and dulness on percussion, with the rational symptoms of tubercles, are indications of a very dangerous malady. The rapid development of symptoms of the acute, in the course of chronic bronchitis, must be viewed as an unfavourable circumstance. The extremes of age also increase the risk in this as well as in the acute state of the disease.

CHAP. IV.

CAUSES OF, AND APPEARANCES AFTER DEATH BY, BRONCHITIS.

i. CAUSES OF BRONCHITIS.

47. *A.* The *predisposing causes* are—whatever lowers the energies of the frame, more particularly too warm or crowded apartments; sleeping with too many clothes; late rising, late hours, and too great sexual indulgence; very early, and far advanced age; the lymphatic and sanguineous temperaments; relaxed habits of body; febrile and exanthematous diseases, the suppression of accustomed eruptions and discharges, and previous disease, or convalescence from exanthematous epidemic, and endemic maladies.

48. *B.* The *exciting causes* are, exposure to a cold and moist atmosphere, or to currents of air, particularly when perspiring; rapid vicissitudes of weather and season; wearing damp clothes or shoes, or sleeping in damp beds or linen; continued exposure to dry cold; quick refrigeration of the body after being overheated and fatigued, or upon coming from crowded apartments and assemblies; wearing too low or very thin dress, with exposure of the neck and chest; rapid atmospherical changes, particularly during autumn, winter, and spring, and especially from cold to heat; epidemic constitutions of the atmosphere; easterly and north-east winds; exposure to the night air after rain; the inhalation of irritating gases, vapours, or mineral or vegetable particles; sudden passage from the cold air into overheated apartments; catarrhal infection; miasmatic exhalations in cold and moist states of the air; the imperfect irruption or retrocession of the exanthematous diseases, and the translation or metastasis of gout, rheumatism, erysipelas, &c.

Many of the causes just enumerated would, in the tubercular diathesis, occasion tubercular consumption; whilst several of the causes which concur in the development of phthisis are productive, in sounder constitutions, and according to the ages of the patients, of some form of bronchitis, or of broncho-pneumonia, or of pleurisy, or of complications of either, most probably of capillary bronchitis and broncho-pneumonia in children; and of asthenic or chronic bronchitis, asthenic pneumonia, or pleurisy, and their various complications in persons more or less advanced in age.

49. *C.* Several diseases both *predispose* to and *directly develop* bronchitis, in one or other of its forms; but in these cases, as I have shown above, bronchitis is chiefly a complication of the original

complaint, of which, however, it may become the most important and predominant part; or it may be sequela of these diseases, which had predisposed the constitution to the operation of the direct or exciting causes, especially those enumerated above. Whooping-coughs, influenza, exanthematous and continued fevers, asthma, emphysema of the lungs, diseases of the heart, &c., are not only complicated with, but also frequently followed by, bronchitis. Tubercular consumption can hardly be said to exist unassociated with partial or more extended bronchitis, and the same remark applies to most cases of chronic laryngitis or laryngo-tracheal phthisis, and not infrequently to acute laryngitis.

Of all the causes which most unequivocally and directly occasion bronchitis — more particularly chronic bronchitis — there are none more manifest in their operation than the inhalation of the molecules or particles of mineral, vegetable, and animal substances by persons engaged in avocations in which, or by which, these particles are diffused in the air. Persons thus occupied are the more liable to become the subjects not only of bronchitis, but also of tubercular consumption, and of laryngeal and tracheal disease, as already noticed, if they do not adopt those precautions which will be noticed hereafter. Those persons who follow avocations by which any of these molecular particles are diffused in the air they breathe, and who neither wear the upper and lower beards, nor resort to other precautionary measures, seldom reach advanced age, and often not even middle age, owing to one or other, or even to all these diseases of the respiratory organs.

50. The prevalence of bronchitis in both *sexes* and in *different epochs of life* will appear from the subjoined tables. *The deaths in England from bronchitis, from phthisis, and from all causes*, in each of the five years from 1853 to 1857 inclusive, have been stated when treating of tubercular phthisis (see Table VII. p. 154). It will be seen from this table, compiled from the Registrar-General's Report, that the numbers of deaths in England in these years have been nearly equal in both *sexes*, and that the deaths from bronchitis have been, on an average, nearly half the number of deaths from phthisis. Now as bronchitis is a very much less fatal disease than phthisis, it follows that the former is much prevalent. During the years 1859 and 60, it was more prevalent than I have recollected it to have been in any year during a tolerably long practice; and I believe that deaths from bronchitis were not much, if at all, fewer than those from phthisis. The tables now adduced will show the rates of mortality from bronchitis, in both *sexes* and in all epochs

of life, for England and for London, during the years stated in them. They moreover show the greater mortality from bronchitis in children under five years of age, and especially in aged persons from fifty-five to seventy-five or eighty. When the numbers living at these ages are considered, the mortality from this disease in aged persons will appear the greater.

TABLE I.—*Deaths of MALES in LONDON by BRONCHITIS at different Periods of Life from the Years 1853 to 1857 inclusive.*

Years.	Deaths of Males in London by all causes at all ages.	Deaths by Bronchitis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 &c.
1853	30,852	2720	862	22	6	40	62	161	329	461	485	255	57	—
1854	37,151	2339	858	19	8	41	65	132	245	344	385	212	30	—
1855	31,354	2774	837	24	12	37	81	187	333	483	495	244	39	2
1856	29,176	2284	883	20	4	21	52	117	235	355	363	199	35	—
1857	29,769	2742	1011	34	9	29	65	155	277	409	469	238	45	1

TABLE II.—*Deaths of FEMALES in LONDON by BRONCHITIS at different Periods of Life in the Years 1853, 54, 55, 56, and 57.*

Years.	Deaths of Females in London by all causes at all ages.	Deaths by Bronchitis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 &c.
1853	22,217	2623	728	21	9	34	65	109	269	465	544	311	65	3
1854	36,546	2277	677	29	6	24	54	98	205	353	508	269	51	3
1855	30,588	2789	720	30	13	24	79	126	271	493	570	397	59	7
1856	28,198	2302	727	34	5	21	57	104	201	380	406	293	75	1
1857	29,384	2968	899	41	7	29	78	124	230	482	612	361	72	3

TABLE III.—*Deaths of MALES in ENGLAND by BRONCHITIS at different Periods of Life in the Years 1855, 56, and 57.*

Years.	Deaths of Males in England by all causes.	Deaths by Bronchitis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 &c.
1855	216,587	13,783	4435	167	58	182	350	663	1189	2052	2618	1752	308	9
1856	198,875	11,043	4114	135	54	141	246	480	971	1485	1940	1251	223	3
1857	212,356	12,798	475	180	51	152	283	607	1054	1752	2221	1464	271	7

TABLE IV.—*Deaths of FEMALES in ENGLAND from BRONCHITIS at different Periods of Life in the Years 1855, 56, and 57.*

Years.	Deaths of Females in England by all causes.	Deaths by Bronchitis.	Under 5 Years.	5 to 10	10 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 &c.
1855	209,116	13,399	3695	177	57	181	370	594	1055	2021	2769	2065	397	18
1856	191,631	10,485	3471	179	46	151	293	465	819	1480	1891	1397	281	12
1857	207,459	12,790	4130	193	55	161	316	521	939	1815	2573	1723	349	15

ii. APPEARANCES OBSERVED IN FATAL CASES OF BRONCHITIS.

These appearances may be divided into, 1st. Those which constitute bronchitis at early periods or stages of this disease; and 2nd. Those which are observed after death by this malady, and

which may be viewed as the more common, or the contingent results of the severity or continuance of the disease, especially in its last stage.

51. *A. THE ANATOMICAL CHARACTERS OF BRONCHITIS.*—(*a.*) When the body of a patient is opened, that has sunk under any disease whilst affected at the same time with a *mild and recent bronchitis*, some redness is found, generally in a circumscribed portion of the mucous membrane, and usually towards the end of the trachea, and in the first divisions of the bronchi. If the inflammation have been more *intense*, the redness extends to a greater number of these tubes, and exists moreover in the smaller ramifications. It sometimes happens that this redness is exactly limited to the bronchi of one lobe only; and it is the bronchi of the superior lobe which seems to be more particularly disposed to inflammation. The red colour of the bronchi presents itself occasionally under the form of a fine injection, which seems to exist both in the submucous cellular tissue, and in the mucous membrane itself, and is usually attended by slight tumefaction. Sometimes the vessels cannot be distinguished, but only a number of small, crowded, red points, which are agglomerated the one around the other. Finally, a uniform red colour is occasionally observed. In some cases the redness diminishes progressively from the large bronchi to the small ones; in others, an opposite disposition is remarked. Occasionally the redness only exists in intervals, in the form of bands or of isolated spots, forming, as it were, as many circumscribed phlegmasia, between which the mucous coat is white and healthy.

52. (*b.*) When the inflammation is *chronic*, the mucous membrane generally loses its lively redness; it presents a livid, violet-coloured, or brownish tint. Finally, and what is very remarkable, in individuals offering all the symptoms of inveterate chronic bronchitis, with puriform expectoration, the mucous membrane of the lungs has been found scarcely rose-coloured, and even perfectly pale through its whole extent. BAYLE and ANDRAL have particularly noticed this fact. I would not wish to conclude that there is not, and least of all, that there has not been, inflammation in these cases; but I think a very copious secretion will often take place from mucous surfaces, and assume even a purulent appearance during its retention in the bronchi, from lost tone of the extreme capillary vessels, with, perhaps, an increased flux or determination of the circulating fluid in order to supply the discharge, all vascularity disappearing with the cessation of circulation.

B. THE CHANGES OBSERVED AFTER DEATH BY SIMPLE AND COM-

PLICATED BRONCHITIS. — Whilst in many of the bronchial ramifications the slighter alterations now stated are only observed, others of a more severe or disorganising nature are seen in other parts or branches.

53. *a. Inflammatory injection*, or active congestion of the bronchial surface is generally *partial*, or affects one part of the air-passages more than another. It is also of a livelier colour, and is usually attended with some of the changes hereafter to be noticed. Partial or inflammatory redness of the mucous membrane is very much more common than general congestion. It may be limited to the trachea and larynx, whilst the bronchi are pale; and in this case it may be confined to one side of the tube. M. ANDRAL has seen it cease abruptly at the median line, particularly when one lung was affected; and then the inflamed side of the trachea has corresponded with the diseased lung. The redness may also be confined to the large bronchi, the mucous surface of the passages above and below its seat being pale; or it may be limited to the smaller bronchi, where it often occasions great dyspnoea and fever, with little or no cough. The bronchi of the upper lobes are most frequently congested and inflamed. Congestion and inflammatory injection of the bronchial mucous membrane, although very often connected with diseases of the substance of the lungs, are not necessarily dependent on any of them; for this membrane may be pale from the glottis downwards in cases of acute, and still more in chronic, pneumonia. The same obtains in respect of tubercles, previously to their softening. In many cases, however, where tubercles exist in the lungs, the surfaces of the smaller bronchi are more or less inflamed or congested; and when the tubercles have advanced to softening, the bronchi nearest them are almost always red. Where tubercular excavations exist, the redness is still more marked and extensive, sometimes proceeding along the trachea to the larynx: bronchitis thus supervening on tubercular phthisis. In these and various other diseases, the inflammatory state of the mucous surface commences in the smaller ramifications, and spreads upwards to the glottis. But in other maladies, which first affect the Schneiderian membrane, throat, fauces, pharynx, &c., the injection of the bronchial surface is chiefly an extension of these; inflammatory action more frequently originating in some one of these situations, and extending itself more or less rapidly, according to the state of the patient, along the surface of the larynx, trachea, and large bronchi successively, until it at last reaches the minute bronchi, or even the air-cells and structure of the lungs. This is

the usual direction in which inflammation of the mucous membrane of the air-passages commences and extends itself; but most frequently without reaching the smaller bronchial ramifications, and pulmonary parenchyma.

54. *b. Thickening of the mucous membrane of the air-passages* is a very common lesion, arising, 1st, from its congested or injected state; and, 2nd, from its increased nutrition or hypertrophy. — (*a.*) The former is most frequently observed in the larynx and small bronchi: it is sometimes found in children about the margin of the glottis, giving rise to a form of croup. — (*b.*) True thickening, or hypertrophy of this membrane, occurs in various situations, occasioning very different phenomena accordingly, particularly in those who had been affected with chronic coughs. This form of thickening may extend throughout the larynx, or may be limited to the epiglottis, to the entrance of the glottis, to the chordæ vocales, or to the ventricles. In the trachea it may occasion no marked symptom; but in the bronchi, particularly the smaller, it gives rise to sensible alterations of the sound of the pulmonary expansion. It may, when extensive, very materially impede the changes produced by respiration on the blood. Hypertrophy of this membrane may also be confined to a circumscribed point, forming thus a tumour rising above the surrounding surface. This form of thickening may assume a nearly cauliflower appearance, from its exuberance. These excrescences have been found in the larynx by MM. ANDRAL and FERRUS.

55. *c. The mucous follicles* may be enlarged independently of the membrane in which they are seated. When this is the case, a number of round granular bodies, of either a white, red, or dark-brown colour, are found on the internal surface of the membrane, surrounded by two coloured circles—one round the centre, the other round the base. M. ANDRAL thinks that they have often been mistaken for tubercles, and for the variolous eruption.

56. *d. Other alterations of structure in the respiratory mucous membrane.*—(*a.*) *Atrophy* is sometimes observed in this membrane, and chiefly in asthenic and chronic cases. In many of these the ciliæ can hardly be detected by the microscope.—(*b.*) *Softening* is much more frequent; and is most common in the larynx, especially in the situation of the chordæ vocales and ventricles, where it is sometimes very remarkable, and has been the only change of these parts observed in persons who had either lost their voice or been hoarse long before death, especially in chronic bronchitis and laryngeal phthisis.—(*c.*) *Ulceration* is not infrequently

found in this membrane. Ulcers may be seated in any part of the air-passages, but are more common in the *larynx* than in the trachea or bronchi. They rarely, however, occur in the larynx, trachea, or bronchi without tubercular ulceration existing also in the substance of the lungs. They occasion various modifications of the voice, according to the parts of the larynx in which they are situated; being found in every point of its internal surface. (See *Laryngo-tracheal Phthisis*, p. 324.) Ulcers, when seated in the *trachea*, are chiefly found in its posterior or membranous part. In some cases they are confined to one side of the trachea, which invariably corresponds to the diseased lung; or, if both lungs be diseased, to that which is most affected. Ulcers are not so frequent in the *bronchi* as in the larynx, but more so than in the trachea.

57. Ulcers in the internal surface of the air-passages sometimes extend no deeper than the cellular tissue connecting the mucous membrane to the subjacent parts. In this case the connecting tissue is much thickened at the bottom of the ulcer. But they sometimes proceed deeper, destroying successively the different tissues, until the parietes of the tube are at last perforated, and a fistulous opening is formed between it and a neighbouring organ or part, as the œsophagus, aorta, parenchyma of the lungs, large blood-vessels, the pleural cavity, &c., or even the external surface; forming, in this last case, a direct communication between its interior and the external air. When a fistulous opening extends into an excavation in the parenchyma of the lungs, it is difficult to determine whether it produced, or was itself occasioned by, the excavation. When it is connected with a cavity arising from the liquefaction of tubercular masses, there can seldom be much difficulty in determining the precedence; but every cavity found in the lungs has not this origin. There can be no doubt that ulcers perforating a bronchial tube may excite inflammation of the substance of the lungs, and occasion either small abscesses, or ulcerations, which enlarge into considerable excavations. But, in the majority of cases, excavations communicating with the bronchi arise from the softening of tubercles; the bronchi being perforated from without inwards, instead of from within outwards, as in the case of ulceration commencing in their mucous surface. The bronchi or trachea may be also perforated from without inwards, by aneurisms, &c., of the aorta, and not infrequently by ulceration commencing in the œsophagus and extending through the membranous part of the trachea; instances of which have occurred in my practice. Suppurated bronchial glands may also perforate the bronchi which they

surround, and pour their contents into them. A similar result may likewise occur from purulent collections, hydatid formations, &c., of adjoining parts, as of the thyroid gland; instances of which are recorded by PORTAL and ANDRAL.

58. *e. Alterations of the secretions of the air-tubes.*—Alterations may occur, 1st, in the gaseous secretion; 2nd, in the perspiratory exhalation; and, 3rd, in the mucous secretion.—(*a.*) Changes of the *gaseous exhalations* are but little understood, and are more matters of inference than of demonstration. There can be no doubt, however, that not only in various diseases, but also in certain states of the system and of the atmosphere, a very material alteration occurs in the proportions of the different gases naturally exhaled by the mucous surface of the lungs. That the successive changes in the system, certain conditions of temperature and of the air, different states of vital force, and the constitutional differences in the various races of our species, modify very materially the quantity of carbonic acid gas and of azote exhaled from the lungs, may be considered amongst the surest established facts in physiology.

59. (*b.*) The *perspiratory exhalations* evidently undergo changes in disease; but their nature and extent are but little known. The vapour exhaled from the respiratory mucous surface very probably may, when excessive, be condensed into a liquid state, and increase the watery fluid sometimes discharged from the lungs. M. ALIBERT states that he has seen, in certain diseases of the skin in which the cutaneous transpiration is suppressed, the pulmonary vapour issuing like steam from the chest, and descending again like an abundant dew. M. ANDRAL adduces, in his *Clinique Médicale*, the case of a person who suddenly discharged, whilst suffering from hydrothorax, an enormous quantity of a serous fluid from the bronchi, at the same time that the fluid which had been infused in the chest was absorbed.

60. (*c.*) Alterations of the *mucous secretion* of the bronchi have been successfully studied by modern pathologists. This secretion is modified both in its quantity and quality. It is often very greatly increased in acute and chronic affections, particularly those immediately affecting the respiratory passages. The quantity of the mucous secretion may be so excessive as to nearly fill up the bronchi, trachea, and larynx, and to suffocate the patient. This sometimes occurs in adults; but still more frequently in children, forming in one of its states a species of croup intermediate between true croup and bronchitis; and, in another state, that described as

asthenic bronchitis. M. BLAUD considers the former, or that seated chiefly in the large bronchi, in which the secretion is consistent and glairy, a "form of croup, and calls it *croup myxagène*." This excessive secretion of mucus is sometimes unattended by any alteration of the air-passages. The mucous secretion may become so viscid as to adhere to the sides of the bronchi; where it may accumulate so as to occasion a fatal dyspnœa, by preventing the passage of the air, and causing a collapse of a portion or portions of the lungs. In other cases the mucus is transformed into a puriform fluid; sometimes without any trace of ulceration, or even of redness, in any of the bronchi; the alteration of the secretion being independent of any perceptible change of structure. More commonly, however, patches, streaks, or points of inflammatory injection of the mucous membrane accompany this state of secretion.

61. (*d.*) *Membraniform exudations*, or false membranes, form more frequently upon the internal surface of the air-passages than in any other mucous canal. Some pathologists have supposed them to be consequent on the most intense states of inflammatory action in mucous membranes; but this is evidently not the case: they are rather a result of a state of the system, probably connected with excess of the albuminous constituent in the blood, together with a disposition in the inflamed vessels to secrete it. These membranes are generally unorganised, and vary in thickness and consistence in different parts as well as in different cases. According to SCHWILGUE, they consist of albumen, with a small portion of carbonate of soda and sulphate of lime. M. BRETONNEAU has detected fibrine in them. They may exist in patches, or in continuous layers, or in perfect tubes; and extend from the larynx, where they usually commence, to the minute divisions of the bronchi. They rarely originate in this latter situation, and advance upwards; but they often commence in the pharynx, fauces, &c., and extend through the glottis, and down the trachea and bronchi. They are most frequently met with in children from two years of age to puberty; and are not confined to, although most frequent in, acute diseases. In some cases they assume, in children, a chronic character, but only when confined to the trachea; whilst a chronic state is most common in adults, when they are usually formed in the bronchi. When, however, they occur in the larynx, the tumefaction of the subjacent membrane, the spasms of the muscles, and their own thickness, often give rise to an acute or fatal disease. When seated in many of the small bronchi, they may occasion

asphyxia by interrupting the changes produced by the air on the blood. It is probable that *fibrinous* or *polypous* concretions may sometimes form in the bronchi, from the coagulation of a portion of blood exhaled from its mucous surface. LAENNEC has described (*Rev. Méd.* 1824, t. i. p. 384) a case which appears to be of this description. Such formations differ from the albuminous exudations, in their containing much fibrine, and being of a darker colour than the latter.

62. (e.) *Earthy or calcareous concretions* occasionally are found in the air-passages, and are sometimes coughed up. They consist chiefly of phosphate of lime; and are formed in the substance of the lungs, and escape into the bronchi. They are described in the FIRST PART of this work (p. 103).

63. (f.) *Hæmorrhage from the respiratory surfaces* is amongst the most frequent changes to which it is subject. In the greatest number of cases of *hæmoptysis*, the blood is exuded without any ulceration or breach of surface: a slight redness of the mucous membrane being the only change that can be detected. When the hæmorrhage occurs in the smaller bronchi, the blood sometimes accumulates and coagulates in them; imparting a blackish or brownish black appearance to the lobules, and constituting the *pulmonary apoplexy* of LAENNEC. The occurrence of hæmorrhage into the parenchyma of the lungs is, however, more strictly deserving of this appellation. The extravasation and coagulation of blood in the small bronchi, giving to portions of the lung a blackish and indurated appearance, are most commonly, but not always, found in persons who have expectorated blood, or died from an attack of hæmoptysis; and are most frequent in those cases which supervene in the progress of diseases of the heart. M. ANDRAL considers, however, that the hæmoptysis is not from those sources which have been called apoplectic; but from a larger extent of mucous surface, and from larger tubes.

64. C. *The fibrous and cartilaginous tissues* of the air-passages experience various changes.—a. The *fibrous* structure of the bronchi is sometimes found either softened or hypertrophied. In this case the voice is remarkably altered. When the fibrous tissue is hypertrophied, increase of thickness is the chief appearance.—The *fibro-muscular* structure, as it exists in the trachea, &c., may be either atrophied or hypertrophied; it may also be softened and destroyed partially or in points by ulceration.

65. b. *The cartilaginous structures of the air-passages* are most frequently diseased in the larynx. The *rings of the trachea*

are sometimes ossified, but seldom or never otherwise altered. The cartilages of the bronchi are often hypertrophied, becoming more apparent, and forming more complete rings than natural. They are also sometimes ossified. MM. REYNAUD and ANDRAL found the ultimate ramifications of the bronchi changed into osseous spicula, with minute canals (the cavities of the bronchi) running through them, in very old subjects. M. ANDRAL states that the bronchial cartilages may become so brittle from disease, as to break into fragments, project into the canal of the bronchi, or become altogether detached, and be ultimately expectorated.

66. *c.* The *cellular tissue* connecting the above structures is often the seat of disease. In cases of bronchitis complicated with laryngo-tracheal disease, the larynx is always inflamed or congested, and, as a consequence of chronic inflammatory action, it sometimes becomes indurated and thickened; diminishing remarkably the calibre of the glottis, impeding the action of the muscles, and affecting the form and movements of the epiglottis. This tissue, in the situation of the larynx and epiglottis, is occasionally infiltrated with *serum*, which, when considerable, constitutes the *œdema of the glottis*, first accurately described by BAYLE. The infiltration may distend the folds of mucous membrane surrounding the rima of the glottis, so as to obstruct more or less the passage through it. This change is generally consecutive of inflammation of the mucous membrane of the larynx, or of chronic affections of this organ. In some cases it is very chronic; in others very acute, quickly producing asphyxy. *Purulent matter* is sometimes found in the cellular tissue of the air-vessels, either in the state of small abscesses, or infiltrating it to a greater or less extent; and either in the ventricles of the larynx, or in any other situation in the course of the air-passages. *Tubercular matter* has also been found in various parts of this tissue, but chiefly in the follicles of the mucous surface of the larynx.

67. *D.* The changes already described very often cause marked change in the air-tubes, either diminishing or increasing their calibre.—*a.* *Diminution of their canals* are occasioned,—(*a.*) by the formation of false membranes, chiefly in the larynx and trachea of children, and in the bronchi of adults;—(*b.*) by thickening of the mucous membrane; occurring principally in the glottis and bronchi;—(*c.*) by infiltrations of fluids into the sub-mucous cellular tissue, chiefly in the larynx and vicinity;—(*d.*) by various substances formed in some part of these tubes, such as hydatids, coagula of blood, concrete mucus, &c.;—(*e.*) by compression by

some tumour situated externally to some portion of them, as by the thyroid gland, an aneurismal tumour, or enlarged bronchial glands.—(f.) Lastly, there is every reason to conclude that diminution or constriction of some part of these passages very often arises, although seldom in so permanent a manner as to be observed after death, from spastic contraction of the fibres or muscles belonging to them.

68. *b. Dilatation of the bronchi* was first described by LAENNEC, and afterwards illustrated by ANDRAL and others. It is most frequently observed in the smaller ramifications; and may be so great as to be mistaken for tuberculous excavations.—(a.) In some cases, the bronchi may be uniformly dilated throughout one or more of their ramifications, some of those which could not naturally receive a fine probe, having attained the size of a goose-quill; and, in some instances, even admitting the finger. These dilated branches are sometimes visible on the surface of the lung, where they terminate abruptly. They occasionally also terminate, particularly near the top of the lung, in an indurated black portion of its substance, or in a cartilaginous mass, or in a calcareous concretion, either exterior or interior to the dilated bronchi. This saccular expansion of the terminal branches of the bronchi forms a peculiar subdivision. We often meet with them, distended in the form of thin membranous vesicles, filled with air, either singly, or in groups, and generally at the apex of the superior lobes of the lungs, or in the vicinity of cicatrices, the remnants of former tubercular cavities. Dilatation of the bronchi affects especially the smaller tubes, as those of the third or fourth order, and is rarely met with in those of the larger trunks.—(b.) In other cases, the dilatation is limited to a particular point of the tube, and has the appearance of an excavated cavity in the substance of the lung, for which it may be mistaken, especially when it is met with in the upper lobe. The size of cavities arising from this species of dilatation varies from that of a hemp-seed to that of an egg. Several of these may co-exist. When they are placed near each other, they form, by their communication, a complicated sinus filled with puriform mucus, and closely resemble some kinds of tuberculous excavations.—(c.) Occasionally they present a third form, consisting of a succession of dilatations, between each of which the bronchus recovers its natural diameter, the walls of the dilated portion being generally thin and transparent. One lung may contain a number of these dilatations.—(d.) The *parietes* of the dilated bronchi are, in some cases, hypertrophied, or more fully

developed than in the natural state; in other cases they are reduced to a delicate membrane, presenting neither fibrous nor cartilaginous tissue. The dilated portions generally contain much mucus, or a puriform mucus.

69. These changes of the bronchi are seldom found, unless in persons who had suffered attacks of chronic bronchitis, or of asthma, or emphysema, with which they may be associated. They are most common in persons of middle or advanced age. But they are also sometimes met with in children who had died of whooping-cough, particularly in its more chronic states, and when complicated with bronchitis. I have occasionally found them in this class of subjects; but only consequent upon this disease. Dilatations of the bronchi, unless when very considerable, seldom occasion any change of the parenchyma of the lungs, beyond compressing and condensing it: they are frequently associated with either grey or dark induration of the adjoining pulmonary substance, and various other changes in the substance of the lungs. Their formation has been much discussed by Dr. CORRIGAN and by ROKITANSKI, but, as will appear in the sequel, with no practical results.

CHAP. V.

OF THE PREVENTION OF BRONCHITIS.

70. THE causes, nature, and circumstances attending the occurrence of this disease, almost preclude the consideration of, or render it difficult to remark upon, the *prevention* of it with advantage to those who may be predisposed to it, or who may be liable to a return of it, after one or more attacks of it. A knowledge of its causes, and the avoidance of them, more especially when suffering from the diseases with which I have stated bronchitis to be frequently complicated, or during convalescence from them, constitutes the chief means of prevention. To those causes I must refer the reader (§§ 47 *et seq.*). But there are certain of those which require a more particular notice, as respects the causation not only of bronchitis but also of pulmonary and laryngo-tracheal consumptions. The habits, or rather the fashions, among males, of wearing either neckcloths or beards, or neither, cannot fail of influencing

the prevalence of this disease. The exposure of the throat and neck, on all occasions, may probably render the respiratory surfaces less susceptible of the influences produced by alterations of temperature and weather; but the amount of benefit from this custom, if any, can be hardly or only vaguely estimated. The habit of wearing thick or warm neckcloths, a directly opposite mode, is not always sufficient to protect from these maladies, especially on accidental exposures, night or day. Wearing the beard, the natural protection of the throat, has undoubtedly no small influence in preventing throat, laryngeal, and bronchial affections; whilst keeping the beard closely shaved has some influence in favouring the occurrence of these affections. The diseases of the respiratory organs, so frequently caused by various *arts and employments*, especially those about to be noticed, should induce persons thus occupied to preserve the beard on the upper lip, or the *moustache*, in order to intercept during respiration the mineral, vegetable, or animal molecules diffused in the air surrounding them.

71. I have already mentioned certain trades (§ 49) the workmen in which are liable to pulmonary consumption. Most of those are also productive of bronchitis, seldom in a simple form, but more frequently complicated with other affections of the respiratory organs. The artisans and workmen who experience these very injurious effects, more especially bronchitis, owing to the inhalation of the various mineral, vegetable, and animal molecules diffused in the air by their avocations—causes which, although very dissimilar in themselves, generally act in nearly a similar manner—namely, by irritating the bronchial surface, and superinducing various modifications of disease, according to peculiarities of constitution, temperament, and habits of life, are chiefly dry-grinders and needle-pointers; edge-tool, gun-barrel, and other grinders; flax-dressers, and pearl and horn button-makers; iron, brass, and other metal filers; stone-cutters, millstone-makers, miners and quarriers, particularly in sandstone; wool-carders and feather-dressers, sawyers, turners, weavers, bakers, and starch-makers. All these suffer more or less, generally in the order here followed (needle-pointers and dry-grinders the most, and starch-makers the least), from chronic bronchitis, in one or other of its modifications: in some, from the spasm of the bronchi thereby occasioned, with the symptoms of asthma predominating; in others, with those of chronic inflammation extending to the lungs; in a few, with dilatation of the bronchi and pulmonary emphysema; and in many,

with tubercular and cretaceous formations. The most inflammatory effects seem to result from needle-pointing, dry-grinding, and stone-cutting; whilst the more asthmatic affections proceed from the horn and pearl button-manufacturing. These workmen seldom live above forty years, and the greater number not beyond thirty or thirty-five. They often experience but little inconvenience till some time before the fatal disease takes place; but they are as often affected with bronchitis in early life, particularly pearl and horn button-makers, the disease subsequently assuming an asthmatic character.

72. Various means have been invented in order to prevent the molecules or dust arising in these trades from accumulating and being inhaled into the lungs of the workmen; but nearly every measure hitherto advised has been neglected by them, even the natural one of wearing the *moustache*. Amongst other contrivances, the muzzle of damp crape recommended by Dr. JOHNSTONE, the sponge by Dr. GOSSE, and M. D'ARCET's "fourneau d'appel," which is, however, not known in this country, may be named. The best means yet devised seems to be that invented by Mr. ABRAHAM of Sheffield, in which magnetic attraction is employed to arrest the floating metallic particles. This, as well as the use of the "damp bag" suspended over the stone, in grinding and pearl button-turning, are most useful inventions. In mining, quarrying, or cutting stones, dry-grinding, &c., much good would probably result from wearing the beard on the upper lip, and from having moistened or wet woollen curtains suspended over the heads of the workmen, and in such a way as to be agitated through the air of the place. The simpler the means, and the less trouble required in their use, the more likely are they to be adopted.

73. In respect of the treatment of bronchitis and other pulmonary diseases which result from these causes, very little difference from that employed under ordinary circumstances is required. The frequent use of emetics is adopted by the workmen themselves, and there can be no doubt of their utility for bronchitis and most of the diseases of the air-passages.

CHAP. VI.

TREATMENT OF ACUTE BRONCHITIS.

THE treatment of this disease should be based on *three great inferences*, which can be formed only by physicians possessed of powers of close and correct observation and of great practical information and acumen. These inferences are — 1st. The state of vital force, or, in other words, of constitutional power manifested by the patient at the time of prescribing for him; — 2nd. The existence of a primary and simple form of the disease, or of a complication of bronchitis with some malady, upon which it has supervened, or which it has superinduced; — and 3rd. The nature of the malady with which it is associated, and the order of succession of the associated diseases.

There are few maladies which require a more intimate observation of the vital force or constitutional power of the patient, than bronchitis; and in none should the prevailing epidemic constitution or character of disease generally receive greater attention. At the time when I first wrote on bronchitis (in 1831), the general vital character of diseases was about changing from a sthenic to an asthenic, or at least to a much less sthenic type. The asthenic form, or one of a less sthenic character than formerly, has up to the present time generally prevailed, and it has become, even more than heretofore, requisite to be guided in the adoption of indications of treatment, and of curative means, by the states of the pulse, by evidences of constitutional energy or debility, by the antecedents of the patient, and by the nature and concurrence of the causes of the disease.

i. TREATMENT OF UNCOMPLICATED ACUTE BRONCHITIS.

The treatment of primary or simple Acute Bronchitis should be especially directed at every stage by the states of vascular action and of vital force, and by the nature and concurrence of its causes.

74. A. *The catarrhal or mild form of Bronchitis* (§§ 3—5) requires merely mild saline diaphoretics*, demulcents, and emollients. When, however, fever is considerable, or the patient complains of soreness and pain in the chest, then a mustard poultice may be applied over the sternum, or the terebinthinate embrocation (see

* No. 22. R. — Liq. Ammon. Acet. (vel Citratis) ʒj.; Spirit. Ætheris Nit. ʒiij.; Vini Antimonii Potassio-Tart. ʒijss.; Mist. Amygdal. dulc. (vel Mist. Camph.) ad ʒviij. Misce. Capiat cochl. j. vel ij. larga, 3tis vel 4tis horis.

p. 226) be placed either over the thorax or between the shoulders; and the dose of the antimonial may be increased in the medicine just prescribed; the bowels being moderately opened by a small dose of calomel or blue pill, with antimonial powder at bedtime, and a gentle aperient draught given in the morning. If the patient be aged, or delicate, or vitally depressed, the antimonial should be omitted from, and a proportion of infusion of cinchona or of the decoction of senega added to, the mixture. Pediluvia, with salt and mustard in the water, or the warm bath, or the semicupium for children, may be allowed at bedtime, and other means which circumstances will suggest may be adopted. Diluents, emollients, weak broths or soups, or mild farinaceous food, may be taken until the more acute symptoms are removed, and then a more restorative treatment, medicinal and dietetic, may be cautiously employed. The white kinds of fish, boiled, and subsequently, chickens, mutton, &c., may be allowed.

75. *B. Treatment of Sthenic Acute Bronchitis (§§ 6—9).*—This variety may be considered the true acute bronchitis. It often, especially in the young, plethoric, and robust, is acutely inflammatory at an early stage; and in strong persons the sthenic character may continue for a very considerable time, if the disease have been neglected or antiphlogistic remedies have not been prescribed. In the former class of patients, as well as in the latter, a moderate blood-letting, by venesection or by scarification and cupping, will generally shorten the duration of the disease, especially if early employed, and render the means subsequently ordered much more effectual than they otherwise could have proved. The quantity of blood which may be taken should depend upon circumstances adverted to above, to the period of the malady, the strength of the patient, the state of the pulse, and the prevailing general type of diseases. It ought not to be so much as to produce fainting, for reaction may follow this state. A slight or more manifest impression made upon the pulse by it will generally be sufficient. Immediately afterwards the preparations of antimony or of ipecacuanha, combined according to circumstances, should be given in full or frequent doses, so as to prevent excessive local action, by determining the circulation to the surface of the body, and promoting perspiration and the excretions generally. Soon after vascular depletion, calomel with antimonial powder, or James' powder, or pecacuanha ought to be given, and repeated at bedtime; and subsequently the mixture No. 22 already prescribed should be taken, with the preparations of antimony or of ipecacuanha in larger or more frequent doses, according to the nature of the case.

76. This treatment will generally procure an abatement of the acute symptoms, and of sthenic vascular action, when promptly, efficiently, and judiciously directed. When these ends are attained, the continuance of the milder diaphoretics, especially of the solution of the acetate or citrate of ammonia, with the spirit of nitric æther, with small doses of nitre, and either of antimonial wine or ipecacuanha wine, will soon subdue the febrile action, and both cool the skin and promote perspiration. If, however, soreness, pain, or heat and tightness in the chest be felt, and the pulse and temperature of the skin continue increased, cupping over the sternum or between the shoulders, moderate in quantity, and with due reference to the vital condition of the patient and the character of the expectoration, may be repeated, and antimonials or ipecacuanha be given in larger doses; if an emetic operation result from them, the effect will be the more beneficial. Calomel and James' powder may be taken at bedtime, and an aperient draught in the morning. If these means are not manifestly beneficial, the terebinthinate embrocation or stupes should be applied over the chest or between the shoulders.

77. In all classes of subjects, *blood-letting*, more especially its repetition, must be cautiously regulated, if adopted at all, by the presence of pain or soreness in the chest, by the state of the pulse, the heat of skin, the character and quantity of the expectoration, &c. At the time when I first wrote upon bronchitis, general and local blood-letting was often required early in acute bronchitis; but now, and for many years past, it has been very generally anathematised, and, although the asthenic diathesis and character of diseases have so long prevailed, yet I believe that this treatment has been sometimes neglected, where a cautious recourse to it was required, owing to the generally prevailing opinion against it—an opinion entertained by many quite incapable of forming a correct judgment as to the circumstances either requiring it, or contra-indicating it; and as to the manner in which the adoption or the neglect of it may influence the course and termination of the disease. When the measures mentioned above have subdued the severity of the symptoms, expectoration will be rendered more easy, or be promoted by combining small doses of camphor, or of ammonia, or of the decoction of senega, with the medicines prescribed above, the antimonial being either relinquished or given in much smaller doses.

78. If the cough continue severe, and the expectoration difficult or laboured, an ipecacuanha or antimonial emetic should be given.

But if the vital powers be much lowered by the continuance of the disease, or by previous treatment, the emetic should consist of the sulphate of zinc, conjoined with ipecacuanha and camphor; and the decoction of senega may afterwards be given in the form subjoined, the intervals between the doses varying with the state of the symptoms.* In some cases attended by congestion of the bronchi and lungs, causing dyspnoea, and impeding the functions of respiration, a recourse to cupping either over the sternum or between the shoulders, although the disease be far advanced, if cautiously and judiciously adopted, will often be most beneficial; and if the abstraction of blood be contra-indicated, dry cupping should not be neglected.

79. If the more acute or sthenic symptoms present in an early stage, should lapse into the asthenic with more or less rapidity, — an occurrence by no means rare, when the disease commences, as it generally does, in the larger bronchi, especially of both lungs, and extends to the smaller, and thence to the capillary bronchi, — the restorative medicines now advised, aided by the external means noticed above, or the more stimulating and tonic remedies recommended for the next or asthenic form of the malady, in doses and combinations suitable to the urgency of the case, must be allowed. These sudden changes in the character or type of the disease are generally owing to a too antiphlogistic treatment at the commencement, or to the rapid extension of the disease to the minute bronchi, causing impeded or interrupted oxygenation of the blood. This change of type occurs chiefly in cachectic, intemperate, and exhausted subjects, and in children and in aged persons. In many of these cases more powerful stimulants given in the food, drink, and medicines prescribed, even than those already mentioned are requisite, and although often unsuccessful are not the less necessary, as being the only means which are attended by a possibility of benefit.

80. *C. Treatment of Asthenic Bronchitis.*—This form of the disease (§§ 9, 10) occurs chiefly in persons who, owing to age, to early childhood, and to the capillary state or seat of the malady,

* No. 23. R—Liquoris Ammoniae Citratis ʒj.; Tinct. Camph. Comp. ʒss.; Ammon. Carbon. ʒj.; Decocti Senegæ ʒv.; Syrupi Tolutani ʒij.; Aquæ Flor. Aurant. ad ʒviij. Misce. Capiat cochleare unum vel ij. ampla, secunda, tertia, vel quarta quaque horâ in aquæ hordei pauxillo. Vel:

No. 24. R—Tinct. Conii, Tinct. Scillæ, aa. ʒij.; Spirit. Anisi, Spirit. Ammon. Aromat. aa. ʒij.; Decocti Senegæ ʒiv.; Syrupi Tolutani (vel Rosæ) ʒij.; Aquæ Pimentæ ad ʒiij. Misce. Capiat cochl. j. vel ij. larga, 3tis vel 5tis horis in aquæ hordei pauxillo.

seldom require vascular depletion. If ventured upon in this form, it should be preferably practised by cupping in small quantity; or dry cupping may be substituted for it. The admissibility of depletion, or of antimonials, or the extent to which they should be carried, and the propriety of having recourse to stimulating expectorants, necessarily depend, in this form of the disease, upon the degree of morbid action and of vital power presented by individual cases, and upon the quantity of the expectoration and the difficulty to excrete it. Small or moderate local depletions are more frequently required when this state of disease occurs in children, than when it is met with in aged persons; whilst the latter are more benefited by expectorants, diaphoretics, counter-irritants, and diuretics, than the former class of subjects. In many cases of this state of the disease, a warm stimulating emetic, consisting of sulphate of zinc, or of ipecacuanha with senega, will promote expectoration and promote the functions of the lungs; and, after its full operation, a mild aperient, or a moderate dose of a mercurial at bedtime, followed by a gentle aperient in the morning, will often be required. But in this class of cases, always numerous in the aged, and in cold and humid seasons, restorative medicines and due support by digestible and nutritious food are generally beneficial. In some cases, especially when the bronchi of both lungs are affected, and the disease extends to the minute bronchi, the risk of asphyxia from interruption to the functions of the lungs being urgent, not only should expectorants be freely prescribed, but also a powerful warm emetic, with sulphate of zinc, capsicum, camphor, &c., be given, aided by external derivatives, dry cupping, stimulating pediluvia, &c. In these cases also, the vital force should be developed by the preparations of cinchona, serpentaria, cascarilla, ammonia, camphor, &c., and by allowing a moderate quantity of wine, or even brandy, in the food or drink of the patient, especially if he have been intemperate, or is much exhausted, depressed, or old. In this state of the disease, both food and drink should be warm, and the medicines given in warm fluids, &c. If it should be preferred to order medicines similar to those just named, the subjoined pills may be adopted and varied as those previously prescribed, according to the age and circumstances of the patient and to the urgency of the symptoms.*

81. *D. The treatment of Acute Bronchitis in Children* should be

* No. 25. R.—Quinæ Disulphatis, Camphoræ, āā. gr. xv.; Pilulæ Galbani comp., Pilulæ Scillæ comp., āā. ʒij.; Olei Cajuputi, q. s. Misce et contunde bene. Fiant secundum artem Pilulæ xxx., quarum capiat unam vel duas 2dis, 3tis, vel 4tis horis.

conducted according to the principles stated above. In robust and previously healthy children, vascular depletion by leeches or by cupping is required in moderate quantity, preferably by leeches in young children, and by these or by cupping in older children. During teething, bronchitis, either catarrhal or acute, frequently occurs; and then the gums require attention and should be freely lanced, especially if they be hot or swollen. A dose of grey powder (*Hydrarg. cum cretâ*) with magnesia and ipecacuanha, may be given at night, and castor oil or some other aperient in the morning. A diaphoretic mixture may also be directed in the course of the day, and the *semicupium* in the evening. In the more acute and febrile form of bronchitis in children, a cautious and moderate blood-letting, according to the age, and state of the patient, followed by an ipecacuanha emetic, and subsequently by a dose of calomel, will generally be most serviceable, especially if the terebinthinate embrocation be placed between the shoulders; the calomel and James' powder, or some other antimonial, in small quantity, to be taken at bedtime, and an aperient in the morning. Beyond two or three doses antimonials ought not to be given to children, especially young and delicate children, and to those living in large towns and much confined in-doors; nor should they be prescribed at all during weaning. Unless in the more acute cases, they should not be continued much longer than now stated, ipecacuanha, or ipecacuanha wine, being substituted. Calomel and ipecacuanha may be given at bedtime, and ipecacuanha wine instead of the antimonial wine in the medicines prescribed above (§ 74). If a strangulating or suffocative cough be complained of, and indications of the extension of the disease to the minute bronchi appear, an emetic of ipecacuanha, or of sulphate of zinc, should be exhibited, and the treatment advised above for the more asthenic forms of the disease be adopted, according to the age and circumstances of the patient. The application of blisters to the chest is sometimes of service; but they should not be applied longer than three or four hours, or longer than they occasion redness of the surface, and then a warm poultice ought to replace them. In many cases a mustard poultice, and the embrocation mentioned above, may be preferred to a blister, which should be cautiously prescribed, and for a short time only, in young children and in all children of a cachectic or delicate constitution. For these especially the cod liver oil should be given on the surface of suitable restorative fluids.

ii. TREATMENT OF THE COMPLICATIONS OF ACUTE BRONCHITIS.

82. *A.* Bronchitis is not infrequently associated, particularly at its commencement, with *sore throat* or *inflammation of the fauces and pharynx*. In these cases the disease extends from the pharynx to the larynx and trachea, and thence to the bronchi, and is commonly asthenic in character. When it supervenes in the course of *diphtheria*, or *diphtheritis*, or of *scarlet fever*, it is always connected not only with depression of the vital force, but also with contamination of the blood, these morbid conditions becoming rapidly increased by the obstruction of the respiratory passages, and by the dirty albuminous exudation often forming a false membrane over the mucous surface of the throat. The complication of *diphtheritis* with bronchitis first came before me in practice from 1822 to 1824 at the Infirmary for the diseases of children, and afterwards in 1826, in the low and ill-drained parts of Kennington and North Brixton. In all these cases the danger was extreme; the treatment adopted for them as well as for others which I have seen during the recent epidemic prevalence of diphtheritis, consisted chiefly of preparations of cinchona with the bi-carbonate and chlorate of potash, or with camphor and ammonia; and of gargles of the muriate of ammonia, muriatic acid, tincture of krameria and decoction of cinchona; or gargles containing a strong solution of boracic acid, or biborate of soda. Terebinthinate embrocations were also applied around the neck and throat, and over the sternum.

83. The complication of *scarlet fever* or of *small-pox* with bronchitis generally requires a similar treatment to the above, and the several other means recommended for the *asthenic* or third form of bronchitis (§ 80). When, however, this disease is complicated with *scarlet fever*, the treatment will depend upon the character of the prevailing epidemic and the circumstances of the case. Early in the complication, local depletions are sometimes required; and afterwards, full doses of camphor or ammonia, or of both,—particularly if the eruption prematurely disappear, or present a dark tint, or if the anginous affection assume an ash-colour, or a dark, red, or brownish hue,—are amongst the chief remedies to be depended on. I have met with severe cases in which the bronchial disease either preceded, or followed, the efflorescence and decline of the eruption in scarlet fever; and in the course of this association, most violent cerebral symptoms have supervened; thus forming a double complication. These cases, although extremely dangerous, are not necessarily fatal. Local depletion may be practised, chiefly

by leeches applied over the sternum, behind the ears, or below the occiput, or by cupping on the nape of the neck; and calomel, revulsants, purgatives, camphor, ammonia, &c., according to the circumstances of the case, ought to be prescribed. The terebinthinate embrocations should be applied, as above recommended, and renewed according to their effects.

84. *B.* When *bronchitis* is consequent upon *laryngitis* (or *tracheitis*, or *laryngo-tracheitis*, or *croup*), either affection preceding the other (§ 49), the treatment should depend chiefly upon the states of vital force and vascular action. If these are sthenic and phlogistic, local depletions, calomel and antimony at first in full doses; purgatives, the warm bath, the semicupium or stimulating pediluvia; embrocations with turpentine applied around the neck and throat and over the sternum; and emetics, especially if paroxysms of suffocative or strangulating cough, or stridulous respiration, supervene, are the means more immediately required. Subsequently, aperients, revulsants, and diaphoretics, especially the solution of the acetate or citrate of ammonia, with the spirits of nitric æther, antimonial wine or ipecacuanha wine, anodynes, &c., should be prescribed; and these, with other suitable means, be employed appropriately to the circumstances of each case.

If this complication present an *asthenic* character, as very frequently observed in young children and aged persons, the treatment advised above for laryngo-tracheal consumption and asthenic bronchitis, more particularly the latter, may be adopted. The decoction of senega, the preparations of cinchona or of other tonics, of camphor, ammonia, squills, ammoniacum; stimulating and warm emetics; the inhalation of watery, emollient, and anodyne vapours; or the vapour of warm water containing a small quantity of a solution of camphor in vinegar, and the terebinthinate embrocations applied in the way just now advised, are the means, in various combinations and modifications, which ought chiefly to be confided in. The more urgent symptoms, especially suffocative cough, accumulations in the bronchi, difficult expectoration, paroxysms of extreme dyspnoea, &c., require not only the means just enumerated, but also stimulants, external irritants, and more particularly emetics consisting of sulphate of zinc and ipecacuanha, with camphor, capsicum, &c.

85. *C.* The occurrence of bronchitis with *measles* (§ 22), either previous to, in the course of, or subsequent to, the eruption, or even the accession of it during convalescence, is very frequent. This association was common in the winter and spring

seasons of 1829, 1830, 1831, and 1832; during which epoch, and subsequently, blood-letting was not so generally indicated, nor so well borne as in former years, the bronchial affection being more frequently of the asthenic type. In some cases, however, small local depletions are required early in the disease, and may be carried further than in the association of bronchitis with scarlatina. I have sometimes found it necessary to deplete locally in both these states of complication, at the very time when I judged it proper to exhibit camphor or ammonia in considerable doses. But in many instances, particularly during the years above specified, patients have recovered as readily where no sanguineous depletion has been employed, as where it has. In other respects the treatment should be much the same as already advised, according as this complication presents more or less of a sthenic or asthenic character. In both types, the external embrocations, revulsants, emetics, and aperients, with restoratives, tonics, and stimulants, in the asthenic forms mentioned above, are generally necessary.

86. *D.* Bronchitis may be contemporaneously associated with *influenza* (§ 26), and in most of the many cases of this complication which I have witnessed during thirty years, this was commonly the case, unless when patients recovering from the latter were exposed to the causes of the former. In every instance of this complication the asthenic character was more or less marked, and the treatment consisted chiefly of various combinations of the decoction of senega with diaphoretics; of sulphate of quinine with camphor, ipecacuanha and expectorants, of terebinthinate embrocations on the thorax, and of warm stimulating emetics. Restoratives, tonics, and stimulants, especially the ammonia-chloride, or the ammonio-citrate of iron, were early prescribed in many cases.

87. *E.* One of the most frequent complications presented to us in practice is that of bronchitis with *whooping-cough* (§ 24). In some cases, this complication commences with the usual symptoms of catarrh, on which those of bronchitis supervene; the characteristic signs of whooping-cough, particularly the convulsive fits of coughing, with the inspiratory whoop, and vomitings, not appearing for some days subsequently. In other cases — and those, perhaps the most numerous, — the inflammatory affection has not appeared until after the invasion of pertussis. When thus associated, bronchitis may be either sthenic or asthenic; the one or the other being more generally prevalent in some seasons than in others. During the years mentioned above (§ 85), the asthenic state was most common; and I have seen several cases in which

sanguineous depletion had been injudiciously practised, particularly as respects quantity. Cerebral symptoms are apt to occur during this complication, and also infiltration or hepatisation of a part of the substance of the lungs. These unfavourable terminations should be anticipated and prevented by small local depletions, — by leeches applied behind the ears; by the exhibition of emetics, and afterwards of camphor combined with ipecacuanha or antimonials, and narcotics, particularly conium or hyoscyamus; by diaphoretics with diuretics; and more especially by the embrocations and revulsants already recommended.

88. *F.* The almost constant complication of *tubercular consumption* with *bronchitis* (§§ 21, 37), although the latter may be very limited in extent in some cases, or extensive in others, commonly in no way affects the treatment of either complaint, more especially the former, as long as the bronchitic affection is neither very extended nor *acute*. But when it is either the one or the other, or both, and as soon as the bronchitic symptoms and the character of the sputum are evidently *acute*, and more especially when the sputum is very abundant, then should it claim the chief attention and an appropriate treatment be prescribed, lest the tubercular disease become greatly aggravated by the continuance of it, as is usually observed. A careful examination of the seat of pain, if any, and of the extent of both the tubercular and the bronchitic disease by means of auscultation, &c., ought to be instituted, and the treatment of acute bronchitis, with strict reference to the severity and to the asthenic or sthenic character of the complaint, should be adopted. If the bronchitic affection be more or less acute or sthenic, and the tubercular disease not advanced into the third stage, and more especially if pain, or constriction in the chest be felt, a few leeches applied near the seat of uneasiness, a small blister, repeated or kept open, or the terebinthinate embrocation, diaphoretics, anodynes, revulsants and the promotion of the secretions and excretions are the means chiefly indicated. In some cases, emetics, mild expectorants, the cod liver oil, restoratives, and even gentle tonics, are also sometimes required, either contemporaneously with, or subsequently to, the foregoing measures, especially when the sputum is very copious, the cough severe, and expectoration laboured or difficult.

89. The bronchitic affection, however, is much more frequently *chronic* in this complication, and persistent, than acute, an attack of acute bronchitis being only occasional or *intercurrent*. But the chronic bronchitic complication, although limited, often very partial, or even slight, is almost constant, and the remedies most appro-

priate to the several stages of phthisis are generally also suited to the bronchitic affection, whilst the means indicated for the latter are beneficial in the former. In this complication, as well as in the simpler or more chronic states of phthisis, cod liver oil taken soon after a meal on suitable medicated or other fluids; the external means of cure, especially the embrocations so often advised; and the diffusion of various medicated vapours in the patient's apartment, as recommended hereafter for the treatment of chronic bronchitis, are often of great service. It should not be overlooked that chronic bronchitis may give rise to, or terminate in, phthisis; and that a judicious recourse to the means just noticed will often prevent this occurrence.

90. *G.* The remark now made as to the treatment of the complication of *chronic bronchitis* with *phthisis*, almost equally applies to the association of the former with *asthma*, or with *whooping-cough*. The bronchial affection complicating these may develope, or terminate in, tubercular formations; asthma and whooping-cough thus passing into phthisis. In order to prevent this termination, the embrocations, counter-irritants, revulsants, external drains, and diffusion of medicated vapours in the air surrounding the patient, are amongst the best means of preventing these affections of the respiratory passages from superinducing chronic bronchitis or from terminating in broncho-pneumonia, or tubercular consumption. There can be no doubt that the peat smoke (peat reek), which is so abundant in the huts and bothies of the peasants in the Western and Northern Isles, and highlands of Scotland, in Iceland and the Faroe Isles, is the chief cause of the remarkable infrequency of phthisis, of chronic bronchitis and asthma, in these places. The antiseptic substances contained in peats generally used for fuel, furnish elements which are either given off, or generated during combustion, and which, with the smoke, are insufficiently dissipated from the dwellings in these places, and, being respired by the inhabitants, protect them from tubercular consumption and bronchitis. A similar sanitary effect is produced by burning wood for fuel, especially if a portion of the smoke from it escape into the dwelling and sleeping apartments. These kinds of fuel disinfect and counteract, by the terebinthinate, creasotic, and antiseptic principles evolved from the resinous and pitchy substances contained in them, the injurious emanations proceeding from the various sources of contamination, both within and without the dwellings in these places, and protect the respiratory organs from the diseases to which they are most liable.

91. *H.* When bronchitis extends to the capillary bronchi, and thence to the air-cells and substance of the lungs, thus passing into *broncho-pneumonia*, a very serious complication is produced, especially in young children, or when it occurs in the course of exanthematous or other fevers, of influenza or whooping-cough (§§ 27 *seq.*). It may even extend to the pleura, and thus further complicate the mischief. The treatment necessarily depends upon the circumstances now stated, and upon the age, strength, and habit of body of the patient. If these be impaired, local depletions, repeated dry cupping, revulsants, external and internal diaphoretics, calomel with aperients and antimonials, rubefacient embrocations, &c., are generally required. But if this complication present asthenic features, as most frequently observed, especially when occurring in the course of the diseases now enumerated, antimonials and other depressing medicines should give place to camphor, ammonia, ipecacuanha, senega, and mild expectorants at first, to emetics, to diaphoretics, to terebinthinate embrocations often renewed, to blisters, and to other external rubefacients and revulsants, as circumstances may suggest. If the vital force be much impaired, warm expectorants, restoratives, stimulants, and tonics must be adopted with such energy as the nature of the case may demand.

92. *I.* When bronchitis occurs in the course of *continued fevers*, the same general principles of treatment are required as have been specified in respect of scarlatina and measles (§§ 19, 23). In such complications it should be recollected that they more or less impede the changes of the blood during respiration, and thereby increase the morbid condition of this fluid characterising both exanthematous and continued fevers. The propriety of having recourse even to local depletions in this complication must depend upon the form of fever, the prevailing epidemic, and the symptoms and circumstances of the case. I have seen a strong and regular-living man, with fever thus complicated, very seriously depressed by a single small depletion. Purgatives are however better borne, particularly when conjoined with camphor or ammonia, or when preceded by an emetic, and followed by saline diaphoretics and mild tonic infusions, especially the infusion of cinchona and wine. One or two full doses of calomel with camphor, followed in a few hours by a cathartic draught, and by diaphoretics and diuretics, will be of much service in enabling the excreting organs to remove the effete elements from the blood which accumulate in it when the functions of the lungs are impeded.

93. The simultaneous occurrence of inflammatory action in

both the *digestive* and respiratory mucous surfaces is not infrequent, particularly in children (§§ 19 and p. 355); and means calculated to benefit the one generally aggravate the other, or risk the accession of cerebral disease. Small local depletions, followed by the pulv. ipecacuanhæ comp., combined with small doses of calomel, or hydrarg. cum creta and camphor; the warm bath and afterwards the stimulating embrocations already specified; the application of blisters for a few hours only, and sometimes repeated; the liq. ammoniæ acet., with spirit. æther. nit., camphor mixture, diuretics, &c., constitute the principal means of cure.

94. *K.* Persons with organic disease of the *heart*, especially with alterations of the valves, or with other obstructive lesions, or dilatations of the cavities, or of the auriculo-ventricular openings, are often liable to pulmonary congestion with bronchitis, but more frequently to chronic or subacute, than to acute bronchitis; and if this last, it is commonly of an asthenic form. In these cases, the more energetic means already mentioned, conjoined with preparations of iron, are especially indicated. In some of these which lately came under my care, the subjoined medicines * removed the bronchial affection.

CHAP. VII.

TREATMENT OF CHRONIC BRONCHITIS.

i. OF SIMPLE CHRONIC BRONCHITIS.

THE *indications* of cure for chronic bronchitis are—1st, to diminish the general irritability and excitability, and quiet the circulation; 2nd, to equalise the circulation, to determine to the skin, and increase the excreting functions; and 3rd, to restore the healthy tone and functions of the bronchial surface, by means which seem to have this effect either directly or indirectly. It is obvious, however, that the accomplishment of the first and

* No. 26. R.—Ferri Sulphatis ʒj.; Quinæ Disulphatis gr. xv.; Camphoræ gr. xii.; Pilulæ Galbani Comp. ʒij.; Pilulæ Aloes cum Myrrhâ ʒj.; Extr. Hyoseyami ʒij. (vel Extr. Conii ʒss.); Extr. Fellis Bovini ʒij.; Olei Anisi q. s. Misce et contunde bene. Divide in Pilulas xlvij., quarum sumantur binæ bis terve in die. Vel:

No. 27. R.—Tinct. Ferri Muriatis ʒvj.; Quinæ Disulphatis gr. xxxij.; Acidi Muriatici diluti ʒij.; Acidi Hydrocyanici diluti ʒjss.; Syrupi Tolutani ʒvi.; Mist. Camphoræ ad ʒiv. Misce. Capiat Cochl. j. minimum ter in die in aquæ cyatho vinario.

second intentions have an indirect influence in bringing about the third.

95. *a.* General *blood-letting* is inadmissible in this state of the disease; and even local bleedings should in many cases be employed with great caution. Cupping, however, to a moderate extent, or the application of leeches is frequently required; and it is evidently more advantageous to repeat the operation to a small amount, than to abstract a large quantity at once. When the disease has existed long, and is attended with a copious discharge, much general debility, and absence of pain upon full inspiration, even local depletion cannot be ventured on. Next in importance to depletion is *counter-irritation*; and for this purpose several means are presented to us. When there is a tendency to acute action, or when the cough is at all painful, and the sputum puriform, either the tartarised antimonial ointment, or a large issue or seton in the side, is preferable: but when there is very marked relaxation of the bronchial mucous surface, blisters and rubefacients, or a succession of them, seem more appropriate. I have, however, found, in a number of cases, terebinthinate embrocations and liniments productive of much greater advantage, and more generally applicable, than either blisters or ointments. They may be employed once or twice daily. The vapour arising from them, and diffusing itself around, has also a direct and beneficial effect, by being inhaled, upon the diseased mucous membrane. I am also favourable to the use of *setons* and *issues*; and have seen several instances of marked benefit from them, particularly in the obstinate state of the disease which simulates tubercular phthisis. But it is chiefly early in the chronic disease, or when it has recently passed into this state from the acute, that issues and setons prove successful. They exhaust the energies of the system too much to be of service in the latter stages, or when the discharge from the lungs is profuse, and the vital energies much depressed. Mustard poultices, or blisters applied to the chest, and followed by warm poultices after the blisters have been applied for a few hours only; or rubefacient plasters between the shoulders, consisting of one part of blistering plaster in seven or eight of Burgundy pitch-plaster, are generally of much service, especially after more active means and in slight cases.

96. *b.* *Expectorants* have been much employed in this state of disease; and though more appropriate to it than to the acute, they are often hurtful from being too exciting to the vessels of the bronchial surface. This is especially the case with squills and

ammoniacum, which ought to be used with much caution, and never whilst pain or soreness is complained of in the chest, with fever, heat of skin, &c. The best expectorants are those which are also astringent, or at least not very heating: amongst these, the *sulphate* or *oxide of zinc*, with small doses of myrrh or galbanum, and extract of *conium*; or small doses of *sulphate of quinine*, or of the *sulphate of iron*, with *ipecacuanha* and opium; or the *sulphuret of potassium*, and the *balsamum sulphuris*, are the most eligible, when the state of the expectoration, of the skin, and pulse, indicates the propriety of having recourse to tonic expectorants. *Opium* has been too much reprobated in cases of this description, as well as in acute bronchitis, owing to the dogma that it suppresses expectoration. I believe, however, that, when judiciously combined, particularly with *ipecacuanha*, with the chloride of calcium, or either of the sulphates of potash, of alumina, or of zinc; or with the nitrate of potash; or with camphor, according to the circumstances of the case, it is a valuable medicine; and that the diminution of the expectoration produced by it, and which has been unaccountably dreaded, is, when it occurs, a consequence of its changing the morbid state of the vessels forming the excreted matter. If it be the object — as necessarily follows from the doctrine of some writers — to preserve a copious and free expectoration in this disease, how can it ever be cured? Frequently have I seen this end pursued, as if it constituted all that was required, and squills, ammoniacum, &c., given accordingly; and the more abundant and easy the expectoration thereby produced, the more rapidly did the powers of life give way, or complete hectic, with all its attendants, manifest itself. The subjoined* have proved serviceable when the pulse was soft, and not remarkably frequent; the skin cool and moist; the sputum very abundant, and consisting

* No. 28. R. — Pulv. Ipecacuanhæ gr. j.; Camphoræ rasæ gr. ss.—j.; Extr. Conii gr. iv.—vj.; Mucil. Acaciæ q. s. M. Fiant Pil. ij. ter die capiendæ. Vel:

No. 29. R. — Zinci Sulphatis gr. vj.; Massæ Pilul. Galbani Co. ʒj.; Extr. Conii ʒss.; Syrupi q. s. M. Fiant Pilulæ xij., quarum capiat unam tertiis horis. Vel:

No. 30. R. — Pulv. Ipecacuan. Comp. gr. xx.; Quinæ Sulphatis gr. vj.; Pil. Galbani Comp. ʒss.; Extr. Lactucæ ʒj.; Syrupi Papaveris q. s. M. Fiant Pil. xvij., quarum capiat binas ter quotidie. Vel:

No. 31. R. — Quinæ Sulphatis gr. vj.; Ipecacuanhæ gr. iv.; Camphoræ rasæ gr. vj.; Opii Puri gr. iv.; Pulv. Rad. Glycyrrh. (vel Extr.) ʒss.; Mucilag. Acaciæ q. s. Misce benè, et fiant Pilulæ xx., quarum capiat duas ter quaterve quotidie. Vel:

No. 32. R. — Balsami Sulphuris ʒss.; Pulv. Ipecac. gr. iv.; Extr. Conii ʒij.; Pulv. et Mucilag. Acaciæ q. s. M. Fiant, secundum artem, Pil. xx., quarum capiat binas quartâ quâque horâ.

chiefly of mucus; and the weakness and emaciation considerable. Dr. ARMSTRONG strongly recommended the balsam of copaiva in chronic bronchitis; but it is seldom beneficial, and is certainly inferior to the other balsams and terebinthines in this affection. In the more advanced stages of chronic bronchitis, particularly when colliquative sweats or diarrhœa occur, the most essential benefit has been derived from the following mixture.*

The cretaceous mixture will often be of service when used alone, or with a little of the chloride of calcium, or with the addition of mucilage, or of hyoscyamus, or conium, or extr. lactuæ, or the extr. papaveris, according to circumstances. In this state of the disease, also, I have given *sulphur* and the *anisated balsam of sulphur* with advantage in mucilaginous electuaries. Dr. L. KERCKHOFFS states that he has administered it with success, in conjunction with the powder of the white willow bark. M. BROUSSAIS relies chiefly upon *mucilages* and demulcents, combined with ipecacuanha and opium, and certainly with great justice. The extr. lactuæ, as recommended by Dr. DUNCAN, may occasionally be substituted for the opium. The decoctions of *Iceland moss*, and the infusions of *conium* or *marrubium*, of the *uva ursi*, or of the *melissa*, with mucilages, anodynes, and ipecacuanha, are also very serviceable.

97. *c.* When the disease is attended with dyspnœa, and profuse or difficult expectoration, *emetics* are of great, although often of temporary advantage only, particularly in aged persons. Ipecacuanha, or sulphate of zinc, with the addition of diffusive stimulants, is the most appropriate in the majority of cases. After this operation the decoction of senega may be given with hydrocyanic acid (the dilute), and with mild tonics, as the infusion of orange peel, or the infusion of cinchona, or some aromatic water. If the disease assume a protracted form, with much debility and expectoration, the ammonio-citrate or the ammonio-chloride of iron, or the tincture of the latter, should be prescribed; or the sulphate of quinine in the compound infusion of roses, and compound tincture of camphor; or sulphate of iron may be taken with the compound galbanum pill and extract of henbane; or the muriated tincture of iron, with additional acid and tincture of columba, in suitable vehicles.

98. *Hydrocyanic acid* is often of much service in the chronic

* No. 33. R_y—Mist. Cretæ ʒvjss.; Vini Ipecac. ʒjss.; Tinct. Opii ʒss. (vel Tinct. Camphoræ Comp. ʒvj.); Syrupi Tolutani ʒiij. M. Capiat Cochlearia duo larga ter quaterve in die.

forms of bronchitis, especially in their *complications* with disorder of the digestive organs, and may be exhibited with demulcents, gentle tonics, astringents, or expectorants. When the disease is associated with derangement of the hepatic functions, or even of the stomach and bowels, it will be necessary to give small doses of blue pill, or of the hydrarg. cum creta, with deobstruents and gentle tonics; and, on some occasions, a dose of calomel from time to time, either alone, or in suitable forms of combination, followed by a stomach purgative.

The treatment by tonics and astringents, especially the sulphates of zinc, iron, or quinine, already noticed (97), are applicable, with but little variation, to the more chronic and humoral states of the disease, particularly in persons advanced in life, and in children, when it has assumed a chronic form after whooping-cough and the exanthemata. I have also occasionally seen benefit derived, in these states of chronic bronchitis, from the *chlorate of potash*, given to adults, in from two to six grains, three or four times a day. This medicine was often prescribed by myself and one of my colleagues, at the Infirmary for Children, during the years 1820—1828, and subsequently, in the more chronic forms of bronchitis, and in various disorders of debility; in which latter it was generally beneficial: but little advantage was frequently derived from it in this disease, unless in those forms of it now mentioned, where it was often of great use, particularly when the morbid action seemed connected with deficient tone of the bronchial vessels, and of the system generally.

99. *d.* In chronic bronchitis, especially when affecting children, or when following whooping-cough or measles, the unadulterated *cod-liver oil* has proved most beneficial in my practice, when taken soon after a meal and on the surface of some fluid or fluid medicine suited to the circumstances of the case. It may be given on the surface of orange or ginger wine, more or less diluted for children, or of milk, or of the subjoined combinations*, or of the prescription,

* No. 34. R—Tinct. Ferri Muriatis ʒij.; Acidi Muriatici diluti ʒss.; Acidi Hydrocyanici diluti ʒss.; Tinct. Columbæ ʒij.; Syrupi Zingiberis ad ʒiv. Misce.

From thirty drops to one or two teaspoonfuls, according to the age of the patient, to be taken twice or thrice daily in a wine-glass of water, on the surface of which the cod-liver oil may also be taken.

No. 35. R—Tinct. Ferri Muriatis ʒss.; Acidi Muriatici diluti ʒj.; Spiritus Anisi ʒss.; Syrupi Zingiberis ʒj.; Aquæ destillatæ ad ʒviij. Misce. Capiat Cochl. j. minimum ad Cochl. j. largum, bis terve in die, in aquæ cyatho vinario, cum Olei Morrhue ʒj. ad ʒss. Vel:

No. 36. R.—Tinct. Ferri Ammonio-Chloridi ʒj.; Aquæ Destillatæ ʒviij. Misce.

No. 9, at p. 242, the dose being carefully regulated according to the circumstances of the case and the age of the patient.

ii. TREATMENT OF THE COMPLICATIONS OF CHRONIC BRONCHITIS.

100. Much of what I have advanced respecting the complications of acute bronchitis apply to the association of other maladies with sub-acute or chronic states of bronchitis. This remark applies more especially to what I have stated respecting the complication of phthisis with bronchitis, to which I need no further refer than that acute bronchitis occurs chiefly as an *intercurrent* affection in the course of phthisis, and requires a treatment mainly directed to its removal or relief, in order to prevent the aggravation and acceleration of the latter malady; whilst chronic bronchitis is a more or less partial or limited affection, which is generally consequent upon the tubercular disease, particularly upon its advanced and latter stages, and therefore more persistent. Hence chronic bronchitis, being most frequently consecutive of, although sometimes terminating in, or producing, tubercular formations, especially in the scrofulous diathesis and the otherwise predisposed, generally requires the remedies which I have mentioned for the treatment both of it and of chronic phthisis, according as the predominating features of each will suggest a preference to one or the other of these means or plans of cure. The best guide to the preferential adoption of these will be found in the appearances of the sputum, in the cough, the vital energy, and other signs and symptoms of particular cases.

In asthma, especially the humid or humoral form of it, in persons advanced in age, chronic bronchitis may be viewed as a predominating morbid condition, more or less closely associating the two maladies. In this complication, the medicines already advised for chronic bronchitis are generally required, more particularly camphor, ammonia, the decoction of senega, the anisate of sulphur, the sulphate or oxide of zinc, the tris-nitrate of bismuth, ipecacuanha, the sulphate of iron or of quinine, assafoetida, galbanum, myrrh, and the balsams, may be severally prescribed, or variously combined, or given with a preparation of opium, or of henbane, or stramonium, belladonna, conium, lobelia, &c. In many cases of this complication, an occasional emetic, of either sulphate of zinc or ipecacuanha, or both, will prove of service, and often render the

Capiat Coch. j. medium ad Coch. j. largum, bis terve in die, ex aquæ cyatho vinario cum Olei Morrhue Cochleare uno medio vel magno.

operation of any of the medicines just mentioned or of others — whether expectorant, diaphoretic, anodyne, antispasmodic, or tonic — more certain and beneficial.

101. In aged persons humid asthma and chronic bronchitis are frequently so associated as to render it difficult to say which is the primary or predominating affection; and this complication is often further increased by obstructive organic disease of the heart, causing more or less congestion of both lungs, and aggravating the dyspnoea and bronchitic symptoms. In these cases the combination of such of the preparations of ammonia, of ammoniacum, of squills, or of cinchona, or of quinine, or of iron, especially the ammonio-chloride or the ammonio-citrate of iron, or the tincture of the muriate or of the ammonio-chloride of iron, or the tincture of sumbul or of valerian, as may be congruous with each other, or with such of those preceding them as the peculiarities of the case will suggest, are the remedies most to be depended upon, especially when aided by rubefacient embrocations, liniments, plasters, blisters, &c. A due regulation of the excretions, both urinary and intestinal, by conjoining diuretics with the above, and by giving stomachic aperients, especially magnesia with rhubarb, or with sulphur and some aromatic or tonic powder, should receive strict attention.

102. The complication of chronic bronchitis with whooping-cough requires nearly similar remedies to those now enumerated; but with these the alkaline carbonates and anodynes, especially the hydrocyanic acid, may be advantageously conjoined. In this association, also, the frequent application of the terebinthinate embrocation between the shoulders, and the occasional exhibition of an emetic, with attention to the states of the excretions and of vital power, taking care to promote the latter, especially when depressed, by restoratives, tonics, and change of air, will generally prove successful.

103. When cases of chronic bronchitis are much protracted, and particularly when they approach the character of humid asthma, or are attended by dyspnoea, or shortness of breathing on exertion, or occur in aged persons, a suspicion of obstructive disease of the heart should be entertained, and its nature ascertained by a careful examination. In these cases, the preparations of iron, especially the sulphate with the compound galbanum pill, or the other preparations with myrrh, balsams, and the medicines already noticed, are chiefly indicated. These, aided by gentle aperients, conjoined with tonics, by a mild digestible diet and restoratives, by

attention to the states of the urinary and intestinal excretions, and by residence in a dry, temperate, and pure air, are the chief means of alleviating this complication, which rarely admits of complete cure. The treatment of other complications of chronic bronchitis will readily suggest itself from what I have already advanced.

CHAP. VIII.

PRACTICAL REMARKS ON REMEDIES RECOMMENDED FOR ACUTE, SUB-ACUTE, AND CHRONIC BRONCHITIS.

104. It cannot be overlooked, that the terms acute, sub-acute, and chronic, as well as sthenic and asthenic, active and passive, severe and mild, so generally and necessarily used in our descriptions of disease, are merely conventional; that sthenic and acute conditions of vital force and vascular action insensibly pass into asthenic and chronic, and that active and severe, silently lapse into mild or passive, according to vital and vascular states, and to diathesis and temperament, habit of body and age. These several conditions are manifested by disease, not only in different persons, but also by the same person in different periods of the malady. And, whilst these terms indicate merely the extreme degrees of the scale of vital force and vascular action, it should also be recollected, that the intermediate grades are more or less numerous, and that these, as well as the more extreme, require due recognition. Upon the ability, the acumen of the physician, to estimate these aright, an ability derived from close observation and experience, the safety of the patient mainly depends. It is impossible for us to measure or to weigh these various and ever-varying conditions otherwise than by the use of these terms, than which we have none more precise to employ; and although the observing and experienced physician, while duly appreciating these, is also guided by still nicer or more precise distinctions, and by numerous minute modifications and circumstances, which hardly admit of description, and which can only be acquired in the course of practice, yet those now enumerated should be used in such a way as will mark both grades and amounts, and with as much precision as possible.

105. *A. Vascular depletion* in acute bronchitis, as well as in various other diseases, has been almost altogether relinquished for more than thirty years. For many years previous to 1830, and

more especially during the first quarter of the present century, *blood-letting* was remarkably abused, as to both its quantity and repetitions. I had numerous opportunities of observing this, as regarded the diseases of intertropical as well as of temperate countries. In the first Part of my "*Dictionary of Practical Medicine*," published in 1832, as well as in subsequent Parts, I endeavoured to combat this abuse, and to show that, whilst some cases, even of the same disease, owing to different grades and states of vital force, to diathesis, to habit of body and to endemic or epidemic influence, admitted of, and were benefited by, general or local blood-letting, and other antiphlogistic remedies, other cases required very different or even quite opposite means of cure. Since then, medical practice has run on to the opposite extreme, until vascular depletions, almost in every disease, have been disused by those who ought to be able to judge as to the propriety of having recourse to them. That they have not been so generally tolerated during the last twenty-five or thirty years, or borne to nearly the same amount where they were required as before this period, are admitted facts, and that the same stationary constitution or influence still continues, cannot be controverted. But reprobation of vascular depletions has been carried too far, until the opinion of those who are incapable of forming an opinion respecting the practice, has become so strong in opposition to it, that many are prevented from having recourse to it, in any way or amount, where it is manifestly required; and cases are occasionally observed, in which, at an early stage, inordinate vascular action, excited vital force, or vascular congestion or oppletion, might have been relieved by a moderate, or even a small and cautious depletion, more especially when resulting from impeded or interrupted exhalation, secretion, and excretion, as so frequently observed in the early course of many diseases. Therefore, although it may be conceded that many persons were subjected to vascular depletions where none were required, and others experienced an unnecessary repetition of the practice, — that blood-letting was often excessively prescribed, as to amount and repetition, during the first quarter of this century, — and admitting that the stationary constitution or influence of that period warranted the practice of large vascular depletions, and that diseases required a recourse to them, yet it does not follow that the present stationary or prevailing constitution should either preclude a cautious recourse to depletions, or prevent all diseases, or all cases of the same disease, from being benefited by them when judiciously prescribed. It ought not to be overlooked, that the causes of

disease in most cases act upon the living economy by impeding or interrupting the functions of exhalation, secretion, and excretion; and that in proportion to the amount of such interruption will the vascular system be overloaded, congested, and the blood even contaminated, owing to the overloaded state of this system, and to the irritation caused by the blood-contamination, increased vascular action, or re-action, or congestion, results which a moderate blood-letting may be reasonably expected to relieve, and thereby to admit of more rapid and more certain effects from remedies internally and externally prescribed,—especially if judiciously selected and congruously combined. To decide when vascular depletion ought or ought not to be employed, and to determine what cases, or even what stage of disease should or should not be depleted, is the duty of the physician; and he ought to be able to discharge that duty, which can only be rightly discharged by estimating with precision the states of vital force and of vascular action—by interpreting correctly the states of the pulse, and of the several natural, animal, and mental functions—of circulation, respiration, secretion, and excretion.

106. *B. Diaphoretics.*—The choice of these in this disease is deserving of attention. Early in the *first* and *second varieties*, I have usually preferred the solution of the acetate, or of the citrate of ammonia, and the preparations of the potassio-tartrate of antimony, with the spirit of nitric æther, and sometimes with small doses of ipecacuanha, and camphor mixture, &c. But, for infants and young children, for the aged, and for the *asthenic* or *third variety*, ipecacuanha is preferable to antimony—for the aged especially and combined with camphor, &c. In the more catarrhal or less acute states of the complaint, ipecacuanha with nitrate of potash and opium; and in the more sthenic states, the same medicines, in larger doses, will often prove equally serviceable with the preceding. While febrile excitement is much increased, diaphoretics and diuretics are frequently productive of little benefit, as the return of free cutaneous and urinary excretion is often the consequence of diminished or exhausted febrile commotion. The object, therefore, should be first to lower the vascular fulness and excitement by cautious and moderate depletion, by purgatives and sedatives, and then to employ those diaphoretics which produce a lowering and refrigerant effect, until the strength of pulse and heat of skin are reduced.

107. *C. Emetics* are amongst the most beneficial remedies we can resort to in certain states of bronchitis, particularly in the *third variety*, and in the *second* after blood-letting, when it is

required. In children they are often remarkably useful, especially when bronchitis is complicated with whooping-cough. They have the effect of unloading the bronchi of the mucus accumulated in them, of relaxing the cutaneous surface, and promoting perspiration. For children, ipecacuanha should be preferred; and for aged persons, and the *third form* of the disease, the sulphate of zinc. In the *second form*, and in all other subjects, in an early stage, the potassio-tartrate of antimony is the best emetic, as it operates both by vomiting, by lowering vascular action, and promoting perspiration. Emetics are more particularly required when expectoration is difficult or suppressed, the cough severe and suffocating, and when the disease is caused by the inhalation of molecules of mineral, vegetable, or animal substances. They, moreover, promote the operation of purgatives. In cases of extreme depression, with suppressed excretion of the secretions from the bronchial surface, the more stimulating emetics, as sulphate of zinc, with camphor, capsicum, &c., should be selected.

108. *D. Aperients, purgatives, and cathartics* have been considered by many writers as of doubtful efficacy in pulmonary inflammations; and, when expectoration is established, as being even prejudicial. But this opinion is not quite in accordance with my experience, which, at the Infirmary for Children alone, must have amounted to many thousand cases of the different forms of the disease. It should be kept in recollection, that the expectoration in bronchitis is not a salutary discharge from the lungs, the promotion of which is a beneficial indication of cure; but that it is the product of a morbid state, of the nature of which it is an index; and that this state is generally inflammatory, and always attended with determination of the circulating fluids, thereby keeping up the discharge. It is obvious, that whatever tends to increase the morbid determination to the bronchial surface will increase the disease, and, consequently, the expectoration; and that whatever derives from this situation will proportionally diminish both. That purgatives or cathartics, judiciously combined, have the effect of deriving from the lungs, by increasing the secretions of the liver and digestive mucous surface, must be evident; and I have accordingly found them serviceable when thus prescribed. Severe attacks of bronchitis, moreover, are favoured by congestions and accumulations of bile in the biliary organs, and by sordes retained on the mucous surface of the bowels. In all those cases more especially—wherein the stools are generally very offensive—and at the commencement of all the forms of the disease, these medicines ought to be exhibited, with the view not only of pro-

moting the abdominal secretions, and of removing faecal matters and sordes, but also of deriving the circulation from the seat of disease; and the bowels should be kept very freely open throughout the treatment. It is, of course, understood that we are not to prescribe cathartics to the extent of depressing the energies of the frame too low, especially when they are already weak. Indeed, purgatives may be as much required, and as beneficially employed, in asthenic cases, as in others of a more phlogistic description, particularly if the bowels have been neglected; effects of a very different nature from that of mere evacuation arising from a judicious choice and combination of them. Thus, when prescribed with bitters, tonics, stimulants, or antispasmodics, in the asthenic or suffocative states of the disease, not only will full alvine evacuations be procured, but also a tonic effect on the digestive organs, and, consecutively, a more moderate secretion in the bronchi, with an easier expectoration, will be produced. I have observed that the combination of purgatives, especially calomel, or those of the resinous class, with camphor, ipecacuanha or antimony, and hyoscyamus, according to the circumstances of the case, is particularly serviceable in bronchial diseases.

109. *E. Expectorants* have been much abused in inflammations of the bronchi; chiefly from the circumstance of the expectoration being too generally viewed as a salutary discharge which ought to be promoted, instead of its being a product of the inflammatory state, or of active determination to the surface of the air-vessels. I consider them quite inadmissible when there is much fever or heat of skin, or when the sputum is abundant and fluid, the patient having sufficient strength to bring it up; and generally in the *second* variety of the disease. On the other hand, in the *third* variety, or when the expectoration is arrested evidently from want of power to throw it off or to excrete it, or from its great viscosity, expectorants are of much service. In such cases, *ammonia* and *camphor* should be first tried, as being generally least detrimental in doubtful cases, and most quickly beneficial. Where the admissibility of expectorants is evident, especially in the asthenic form of the disease, and in aged persons, *squills*, *ammoniacum*, *galbanum*, or *senega*, may be directed; with the precautions, and in the forms, already recommended. When expectoration is rendered difficult, and the cough suffocative, from the tenacity and consistence of the sputum, as is sometimes the case, *attenuants* and *alteratives*, as the fixed alkalies combined with ipecacuanha, &c., exhibited with camphor or ammonia, will be found of much service.

In nearly all states of bronchitis, *camphor* is a most valuable medicine. Its virtues have been singularly overlooked by the writers on this disease; but, when combined with antimony, nitrate of potash, ipecacuanha, &c., and given in small doses, in the more inflammatory and febrile states of the disease; or when prescribed in progressively larger quantities, with *diuretics*, the spirit. æther. nit., opium, &c., as the vascular excitement subsides, and febrile heat disappears; and in large doses (from three to five grains), with ammonia, ammoniacum, senega, opium, &c., when exhaustion and difficulty of expectoration from deficient power are urgent; it is one of the most valuable remedies we possess in this, as well as in several other diseases. The *Polygala senega* is also one of the most useful expectorant remedies in this affection. The subjoined formula * will generally diminish the expectoration without increasing the dyspnœa, render the pulse slow and fuller, and the respiration freer.

110. *F.* The *inhalation of emollient and medicated vapours* is occasionally of much benefit in the sthenic form of the disease, but chiefly in its first and second stages. The vapour arising from a decoction of marsh-mallows, or from linseed tea, or from simple warm water, is the best suited to this state; and should be employed from time to time, the *temperature of the apartment* being duly regulated throughout the treatment, and constantly preserved from about 66° of Fahr. to 70°. Dr. PARIS recommends, during the dry easterly winds of spring (when the disease is so prevalent), the vapour of warm water to be diffused in the patient's apartment. In the early stage it may be of advantage. In the case of the son of an eminent medical writer, attended by Dr. GORDON, Mr. ANNESLEY, and myself, this was tried in the state of the air alluded to, but with no benefit. The case terminated fatally, from extension of the disease to the air-cells and substance of the lungs. When the expectoration becomes whitish, opaque, and thick, the vapour may be rendered somewhat more resolvent by adding a solution of camphor in vinegar, and extract of conium or hyoscyamus to the hot water, or to the emollient infusions now mentioned; and in the asthenic variety, particularly when the difficulty of expectoration and the fits of dyspnœa are distressing, or when the excretion of the morbid matter is impeded or suppressed from

* No. 37. R_y—Potassæ Bicarbon. ʒjss.; Ammonia Carbon. ʒj.; Tinct. Camphoræ Comp. ʒss. (vel Tinct. Hyoscyami ʒij.); Spiritus Ætheris Nit. ʒss.; Decocti Senegæ ʒiv.; Syrupi Tolutani ʒss.; Aquæ Pimentæ ad ʒvijj. Misce. Capiat Cochl. ij. larga, 4tis vel 6tis horis.

want of power, the medicated vapours and gases about to be noticed may be tried, according as either may be suited to the peculiarities of individual cases.

111. *G. The inhalation of stimulating vapours*, especially the vapour of tar and turpentine, has been recommended by CRICHTON, PAGENSTECHER, HUFELAND, FORBES, HASTINGS, ELLIOTSON, GANNAL, and others, and been disapproved of by some. I believe that they have frequently been used in too concentrated a state; or too much of the vapour has been diffused in the respired air, occasioning irritation of the bronchial membrane, instead of a gently tonic and healing effect. Whenever any of the vapours advised in this disease produces an increase of the cough, either its use should be left off, or its strength greatly reduced. The manner of having recourse to such vapours, as well as the choice of substances emitting them have not, in my opinion, always been judicious. The tar vapour is occasionally of service, chiefly from the quantity of turpentine it contains; while the acrid empyreumatic fumes which it also emits counteract whatever good effect the former constituent might produce. Would it not, therefore, be preferable to try the effects of the substance from which the advantage is obviously derived? I have done so in some cases of this disease, and seen marked benefit result from it: and therefore recommend it to the notice of other practitioners. In former times, medication by fumigations and vapours was much resorted to; and it is probable that the early use of incense and various balsamic and aromatic fumes in religious rites had some relation to their prophylactic effect against disease, or even to their curative influence, the more especially, as the priests of antiquity also exercised the healing art. In several of the productions attributed to HIPPOCRATES, the inhalation of vapours and fumes of various resinous and balsamic substances is recommended; and a number of writers in the 16th, 17th, and 18th centuries have advised a nearly similar method, and employed camphor, benzoin, amber, frankincense, myrrh, storax, assafoetida, sulphur, cloves, the balsams, &c., for this purpose. This practice was employed by BENEDICT (see his *Theatrum Tabidorum*) in consumptive diseases; and BOERHAAVE gives several formula in his *Materia Medica*, for fumigations with the above substances. MEAD, in his *Monita et Præcepta*, offers several remarks on this subject. He observes — “that fumigation with balsamics, &c., is of vast service in some cases; which is to be done by throwing the ingredients on red coals,” &c. After noticing the undeserved neglect of this practice, and the

propriety of thus applying medicinal substances directly to the seat of disease, he states, that the smoke of the balsam of tolu conveyed into the lungs, or the smoking this substance like tobacco, is of signal service in diseases of this organ. It appears from the writings of FRACASTORI that the fumes of *cinnabar* were much employed by inhalation in the treatment of the constitutional forms of syphilis, at an early period of the history of that disease, when it assumed a pestilential form.

112. Notwithstanding the unsuccessful attempts of BEDDOES to revive the practice, by employing the elementary and permanently elastic gases, but according to views too exclusively chemical, the practice of inhalation has long been neglected or undeservedly fallen into the hands of empirics. Very recently, however, it has been brought again into notice by M. GANNAL, Mr. MURRAY, and Sir C. SCUDAMORE; and *chlorine gas*, and fumes of *iodine*, and watery vapour holding in solution various *narcotics*, have been recommended to be inhaled. I have tried those substances in a few cases of chronic bronchitis; but in not more than two or three cases of tubercular phthisis. The chlorine was used in so diluted a state as not to excite irritation or cough. The sulphurate of iodine, and the *liquor potassii iodidi concentratus* were also employed; one or two drachms of the latter being added to about a pint of water, at the temperature of 130°, and the fumes diluted with atmospheric air were inhaled for ten or twelve minutes, twice or thrice daily. The tinctures or extracts of hyoscyamus and conium, with camphor, added to water at about the above temperature, were likewise made trial of; and, although the cases have been few in which these substances have been thus used by me, yet sufficient evidence of advantage has been furnished to warrant a cautious recourse to them in this state of the disease.

113. *Inhalations* also of the fumes of the *balsams*, of the *terebinthinates*, of the odoriferous *resins*, &c., are evidently, from what I have seen of their effects, of much service in the chronic forms of bronchitis: and I believe that they have fallen into disuse from having been inhaled as they arise in a column or current from the substances yielding them, and before they have been sufficiently diffused in the air. When thus employed, they not only occasion too great excitement of the bronchial surface, but also intercept an equal portion of respirable air, and thereby interfere with the already sufficiently impeded function of respiration. M. NYSTEN has shown (*Dict. des Scien. Méd.* t. xvii. p. 143) that ammoniacal and other stimulating fumes, when inhaled into the lungs

in too concentrated a state, produce most acute inflammation of the air-tubes, generally terminating in death; and has referred to a case in which he observed this result from an incautious trial of this practice. The vapours emitted by the more fluid balsams, terebinthines, the resins, camphor, vinegar, &c., and from chlorine and the preparations of iodine, should be much more diluted by admixture with the atmospheric air, previously to being inhaled, than they usually are. According to this view, I have directed them to be diffused in the air of the patient's apartment, at first in very small quantities, regulating the quantity of the fumes, the continuance of the process, and the frequency of its repetition, by the effects produced on the cough, on the quantity and state of the sputa, and on the respiration. The objects had in view have been gradually to diminish the quantity of the sputum, by changing the action of the vessels secreting it; without exciting cough, or increasing the tightness of the chest, or otherwise disordering respiration. From this it will appear, that the prolonged respiration of air containing a weak dose of medicated fumes or vapours, is to be preferred to a short inhalation of them in their more concentrated states. The want of success which Sir C. HASTINGS and others have experienced, evidently has been partly owing to the mode of administering them, and partly to having prescribed them inappropriately. When the patient complains of pain in any part of the chest, they are as likely to be mischievous as beneficial. Where benefit has been obtained, it will be found that it was when the fumes of the more stimulating of those substances were diffused, in very moderate quantity, in the air of the patient's apartments; or when he passed, at several periods daily, some time in a room very moderately charged with the vapour or fumes of the substance or substances selected for use.

114. *H.* There are various medicines which are occasionally useful, when exhibited in appropriate states and periods of the disease. Amongst these, *narcotics* and *sedatives* deserve an especial notice. *Opium* should not be exhibited alone, as long as febrile action is great; but, in combination with antimony, or ipecacuanha, and nitre, it is often a most valuable medicine. It is best given in small or moderate doses, in conjunction with camphor and expectorants, where vital power is reduced and expectoration difficult. In general, when the skin becomes cool, the bowels are well evacuated, and the air-tubes remain irritable, opium, or some other narcotic or anodyne, is indispensable. Opium, and others of this class of

medicines, particularly when judiciously prescribed, are then of service, not only by lowering the irritability of the system and of the air-passages, and by quieting the cough, the frequency or severity of which often aggravates the inflammatory irritation of, and determination to, the bronchial surface, but also by equalising the circulation, by determining to the skin, and promoting perspiration. In the more phlogistic states of the disease, and at its commencement, *colchicum* or *digitalis* has been recommended. When the sputum is thick and opaque, *colchicum* is less beneficial than at an earlier period, excepting in conjunction with diuretics, ammonia, and camphor. When the skin has become cool, it is no longer of use. In the *third* variety, it is seldom indicated, unless at the commencement of the disease, or when combined with ammonia and camphor; and then it should be given, if given at all, in very small doses. Upon the whole, both *colchicum* and *digitalis* are hardly to be depended upon in acute bronchitis. *Hyoscyamus*, *conium*, and the extracts of *poppy* and of *lettuce*, are very generally serviceable in the different forms of the disease. But the amount of advantage will entirely depend upon the manner in which they are prescribed. In the sthenic and febrile states, and at the commencement, they should be associated with antimonials, ipecacuanha, refrigerants, demulcents, and emollients; with diaphoretics, and with diuretics. When the disorder assumes an asthenic state, or when expectoration is difficult, the cough distressing, and the skin cool, any of the sedatives particularised may be conjoined with either ammonia, camphor, or the fixed alkalies, or with other attenuants, and with expectorants and tonics, &c. according to circumstances. When the acute form of the complaint seems to be about lapsing into the chronic, the combination of *gentle tonics* with emollients and diaphoretics is often of service. The infusion or decoction of cinchona, or the mixture or infusion of cascarilla or of uva ursi, may be then prescribed*: —

115. *I. External measures* ought not to be overlooked during the course of the disease. *Blisters* are not admissible in the early stages of sthenic bronchitis. But, in the asthenic disease, or when inflammatory action and febrile heat have been subdued by depletions, &c., blisters are of much service, and may be applied either between the shoulders or on the breast; and, in some severe cases,

* 38. R—Decocti vel Infusi Cinchonæ ʒijss.; Liq. Ammon. Acet. ʒj.; Mucilag. Acaciæ ʒss.; Spirit. Æther. Nit. ʒijss.; Tinct. Camphoræ Comp. ʒss.; Extr. Conii gr. xii.; Syrupi Tolutani ʒss. M. Capiat Cochleare unum amplum secundâ vel tertiâ quaque horâ, vel Coch. ij. quintis vel sextis horis.

re-applied or kept discharging for some time. In young children, and in adult or aged persons, when the secretion of the bronchial surface is profuse, and the powers of life much exhausted, I have derived more permanent advantage from the application of the terebinthinate embrocation over the chest or back, than from blisters. When blisters are employed, much benefit will sometimes arise from removing them as soon as slight redness of the skin is produced, and covering the part with a large warm bread and water poultice, which ought to be frequently renewed; or by applying a succession of warm fomentations. In some extreme cases of this description, I have seen much advantage derived from applying over the epigastrium and lower part of the chest, a flannel wrung out of hot water, the spirits of turpentine being immediately afterwards sprinkled over it, and allowing it to remain until severe burning heat of the skin is produced by it. If suffocation be threatened either by the profuseness of the secretion, by its difficult expectoration, or by exhaustion of the vital energy; and if we be, as we then unfortunately are, at a loss for any probable means of success; this application will sometimes have a remarkable effect, and save the life of the patient, particularly when assisted by the internal use of camphor, ammonia, &c. I have often witnessed a beneficial result, in most dangerous cases of this description, from the internal as well as the external use of turpentine, particularly at the Infirmary for Children, where I have for many years had recourse to it in cases of danger.

116. The *tepid or warm bath*, or semicupium, or pediluvia, with salt and mustard in the water, will often be of service early in the disease; and in the course of it, sponging the surface of the chest or of the whole trunk with warm water and vinegar, and afterwards with warm water containing the dilute nitro-muriatic acids (one part of the nitric, to two parts of the muriatic acid), particularly towards the decline of the disease, or when we dread the lapsing of the acute or the subacute into the chronic or the asthenic form, will generally prove of essential service; and also will be of use, when the expectoration is profuse, the debility is great, and little or no febrile heat is present, or when the disease is more active, the habit of body being relaxed or leucophlegmatic. In these states of the system, a solution of common salt in warm or tepid water may likewise be used as a lotion to the chest or trunk; a pitch plaster, rendered more or less rubefacient by the addition of a portion of emplastrum lyttæ, may also be applied between the shoulders.

CHAP. IX.

REGIMENAL TREATMENT OF ACUTE AND CHRONIC BRONCHITIS.

117. *A.* The regimenal treatment of bronchitis requires strict attention.—*a.* In the *sthenic acute* disease it should be strictly antiphlogistic; and, at the commencement of convalescence, a farinaceous diet adopted, until out-of-door exercise may be taken, or shortly before. In the *asthenic states* of acute bronchitis, this regimen is chiefly applicable to the commencement of the disease: subsequently, nourishment in small quantities, suited, in kind and frequency of partaking of it, to the state of the symptoms, the powers of the digestive organs, and feelings of the patient, should be permitted; and even animal food of a digestible nature, in moderate quantity, may in some cases, particularly in the aged, be permitted once a day. The decoction of Iceland moss, jellies, mucilaginous and emollient soups; shell-fish; the different kinds of white fish, dressed either with sweet oil or the oil obtained by boiling their fresh livers; the lighter kinds of animal food; and, in the case of infants, attention to the milk of the mother, or a healthy wet-nurse; are all occasionally of service during early convalescence from the *acute* forms of bronchitis, and in the progress of the more febrile states of the *chronic* disease. In the more asthenic cases of this latter, or when the expectoration is profuse, the skin cool and moist, and the habit of body lymphatic, relaxed, or wasted, animal food, especially fresh beef or mutton, underdone, and in moderate quantity, new eggs, or a due proportion of digestible and stimulating food, will be found most serviceable. In nearly all the *chronic* states of the disease, particularly in their advanced stages, a light nutritious diet is necessary.

118 *b.* The common *beverages* of the patient during the acute forms of the disease, should be chiefly regulated by the state of febrile action and of vital force, and by compatibility with the treatment adopted. Barley-water, with lemon-juice, the common imperial drink, or apple-tea, or tamarind-water, and various cooling and aperient fluids should be employed in the sthenic form of the acute disease. In the asthenic and chronic states, the Bordeaux wines, or the wines of Burgundy — generally reduced by one-third or one-half water; or ale, also reduced, to which a little of the

liquor potassæ, or of Brandish's alkaline solution, has been added, may also be tried at meals; and either of these, or of the more cooling beverages, adopted, that may be found to agréé best with the patient. If the disease evince a disposition to terminate in dropsy, the imperial drink, with the addition of a little bi-borate of soda, will be most serviceable. In the advanced period of *chronic*, or during convalescence from *acute*, bronchitis, the sulphureous mineral waters will often be beneficial. Those of Harrogate, Leamington, or Moffat, or the chalybeate waters of Harrogate or Tunbridge Wells, may be taken according to the circumstances of the case; or of Enghien, Bonnes, Barèges, or Cauterets; or the artificial waters of Ems or Carlsbad.

119. *B. Change of climate* is one of the chief remedies for chronic bronchitis, and for the advancement of convalescence from the acute and asthenic varieties of the complaint. In the more obstinate cases of the chronic form, more especially when recurring sub-acute attacks are experienced from states of season or weather, or from exposure to cold or humidity, or when complicated with humid asthma, or whooping-cough, or with congestion of the lungs, a change of air, climate, or locality offers the most certain and permanent advantages. It is not, however, to low, humid, or relaxing situations that a change should be made. Neither places on the sea-coast, nor sea voyages present sufficient evidences of benefit in these cases and complications. I have, when treating of changes of air in cases of *tubercular phthisis* (see p. 292 *et seq.*) stated, that after weighing the evidence in favour of low, humid, and temperate localities on or near the sea-coast, and those for elevated, dry and temperate situations inland, the latter predominate. This result being manifest as regards tubercular phthisis, it is still more so as respects the chronic and asthenic forms of bronchitis, and their chief complications. Since the *first* and *second parts* of this work were printed, my friend, Dr. J. WEBSTER, directed my attention to a very elaborate communication in the Memoirs of the Imperial Academy of Medicine for 1855 by M. J. ROCHARD. In this memoir the author has inquired into the mortality from pulmonary diseases, especially phthisis and bronchitis, in many of the seaport towns in France, Italy, Great Britain, Spain, the United States, and South America, and in vessels voyaging to various temperate and in tropical places, and he has shown that it is much greater in these than in situations inland. M. ROCHARD's researches confirm the opinion I had already expressed, both in my "*Dictionary of Practical Medicine*," and in the place of the present work just

referred to. But he has not sufficiently considered the causes of this increase, which are much more influential in the places he has adduced than in inland localities. In ships, whether commercial or armed, the crews are confined, during their watches below, to close, insufficiently ventilated, and limited spaces, in which the air is so frequently respired as to become loaded with animal vapour, and most offensive to persons who visit these habitations and dormitories. When the watch is called on deck, the sailors rush into an open air, hot and perspiring, and generally insufficiently protected against the change. They are, moreover, exposed to the humidity caused by frequent washings, or wettings of the decks, and the evaporation from ligneous surfaces. Sea-port towns contain many sailors, fishermen, and boatmen who are either similarly circumstanced or who lead a precarious existence, and are more exposed to the causes of, and are hence more liable to, pulmonary diseases than to any other class of maladies. Notwithstanding these causes, and their effects in heightening the mortality in sea-port towns and in shipping, it does not follow that persons voyaging for health, or passengers, or those who are not thus exposed, should suffer in any marked degree, or that in an early stage of consumption the sea-air should counteract the good effects which may be otherwise produced, when every comfort is furnished to them. There can be no doubt that voyaging at an advanced period of phthisis or of chronic asthenic bronchitis, more especially in very high temperatures, is most injurious and hastens a fatal issue. However, in weighing all the circumstances, without giving any one undue preëminence, I must come to the conclusion that a residence in an elevated, dry, and temperate inland locality, is preferable in tubercular phthisis, and still more so in chronic and asthenic bronchitis, and most of their complications, to a residence in a humid and sea-coast situation, although the air of the latter may be temperate and little liable to sudden or great changes.

120. The conclusion at which I have arrived agrees with the opinion firmly asserted by Dr. RUSH, and by other eminent authorities, although opposed to the practical recommendations of many physicians in this country. It is, however, very difficult to name the places to which a change should be made, especially in this country during the winter and spring months. In the summer and autumn many places in both England and Scotland will be found beneficial for chronic and asthenic bronchitis, especially HARROWGATE, TUNBRIDGE WELLS, MOFFAT, &c. In these a healthy air, and mineral waters most appropriate to the disease, will be found. Other places

abroad have been recommended by my friends, Principal BARCLAY* and Dr. H. BENNET (see p. 303), who have derived marked benefit from a residence in them.

121. During the progress of convalescence from an attack of bronchitis the patient should endeavour to make his recovery as complete as possible in order that it may be permanent; but his physician has too often but little opportunity given him to aid this intention, or to direct those means which are required to prevent a return of the

* The Reverend Dr. BARCLAY, Principal of the University of Glasgow, has given the following interesting and instructive account of his own case, and of the benefit he derived from a residence in Middle and Upper Egypt.

He states, that "in Middle and Upper Egypt, from the beginning of October to the end of April, the invalid may breathe, under a bright and cloudless sky, an atmosphere at once of a warm and equable temperature, of perfect purity, and free from all excess of humidity. The climate of other regions may be equally distinguished by one or more of these properties (though even that is doubtful); but assuredly there is no other habitable part of the globe in which they are all combined in so great perfection.

"The malady for which I sought relief in a southern climate was chronic bronchitis in its most aggravated form. All the usual remedies, both external and internal, had been resorted to, and steadily persevered in, under the ablest medical advice, but with little temporary and no permanent benefit. I had tried, with the same unfavourable result, those places on the south coast of England which are usually recommended to invalids. The symptoms obstinately resisted every remedial measure. The chronic character of the disease was frequently exchanged for attacks of a subacute form. These always commenced with inflammation of the pharynx, creeping insidiously down the glottis and trachea to the bronchial tubes, which became gorged with mucus throughout their whole extent; and on every spot on which the stethoscope could be planted over the lungs the mucous *râle* was to be heard. Dyspnoea, accompanied with loud weasing, was at all times distressing; but its nocturnal exacerbations, which invariably occurred after a short sleep, like fits of spasmodic asthma, were often so fearfully violent as to threaten suffocation. The digestive organs were deranged, I had no appetite for food, my frame was emaciated, and my strength prostrated.

"I was so enfeebled as to be unable to encounter the voyage till the month of November; and thus I lost two months of the season suitable for the residence of an invalid in that country. Yet the benefit which, by the blessing of Providence, I reaped from that delicious climate, was most signal; and far exceeded all that my most sanguine hopes had ventured to anticipate.

"On the passage outward, I stopped five days at Malta, but found the heat so oppressive in the day-time, and the chills in the evening so severe, that I was glad to make my escape. The extreme humidity of the atmosphere in that island, notwithstanding its high temperature, must always render it, I apprehend, an unfit resort for a bronchitic patient; and the greatness of the diurnal range of the thermometer, at least in winter, makes it questionable how far it is an eligible residence for consumptive patients. It is believed that an inquiry into *results* will not tend to give a favourable idea of its sanative influence on that class of complaints. Of the climate of Alexandria also I have reason, as I shall show afterwards, to speak unfavourably. In Cairo, however, a very different climate was found; and I had not been many days there when I began to experience its effects in allaying the irritability of the respiratory mucous membrane."

complaint. The secretions and excetions should be duly regulated and promoted by aperients conjoined with tonics, according to the exigencies of the case. The compound infusions of gentian and senna, with alkaline carbonates, or saline deobstruents, or diuretics may be taken; or the sulphate of iron, with the aloes and myrrh, and the compound galbanum pills, may be preferred, especially for females.—Exercise in the open air, either on foot or horseback, ought not to be neglected when the weather admits of it. Even although exercise is freely taken, and the bowels are preserved in an open state, an occasional active cathartic will be of service, especially if the diet be liberal and invigorating. If indications of a return of the complaint appear, particularly if exposure to wet or cold or malaria have caused it, an emetic should be given and followed by a warm bath, and by diaphoretics suitable to the symptoms present. During convalescence, as well as during the course of the disease, flannel should be worn next the skin, and the diet and beverages allowed ought to depend upon the state and requirements of the case. Restoratives, stimulants, tonics, or wines, are often required during convalescence,—seldom however in children, but frequently in aged persons; but these should be given at first with caution, and their effects watched, especially in young subjects, or after the more sthenic and acute forms of the disease.

CHAP. X.

NOTICES OF CERTAIN MORBID CONDITIONS OF THE RESPIRATORY ORGANS SOMETIMES CONSECUTIVE OF BRONCHITIS.

CERTAIN morbid states of the bronchi and of the substance of the lungs are not infrequently connected with or consequent upon bronchitis, acute, sub-acute or chronic.—They may accompany first attacks or may follow upon without any necessary sequence, or may be produced by repeated attacks, or by protracted or exasperated states of the disease. The morbid conditions to which I will briefly advert are, congestion of the bronchi and lungs, bronchorrhœa, dilatation of the bronchi, and ulceration of the bronchi.

i. CONGESTION OF THE BRONCHI AND LUNGS.

122. The *characteristic indications* of this dangerous condition are, *urgent and continued dyspnœa; little or no cough or expectoration; anxious, pale, or livid countenance; soft, weak, and quick pulse; and often cold or clammy perspiration.*—This state of disease is seldom seen in a primary, severe, and general form; but it is very common in more slight and partial states, and as an attendant on typhoid, malignant, and pestilential diseases, and on exanthematous fevers, especially measles, scarlatina, and small-pox, either shortly before the breaking out, or upon the premature disappearance of the eruption, when it often assumes a very general and severe form; and it not infrequently, in slighter grades, ushers in other diseases of the bronchi, particularly hæmorrhage, bronchitis, humoral asthma, &c. General idiopathic congestion of the bronchi, to such an extent and degree as to destroy life, although rare, is sometimes met with. Several cases have been recorded of persons who, without any apparent cause, were seized with urgent dyspnœa, increasing until it terminated in death; and, on dissection, the only morbid appearance observed was general congestion of blood in the capillary vessels of the mucous and sub-mucous respiratory tissues.

123. *A.* The *symptoms* of this affection have not been sufficiently investigated; but they may be stated to consist of continued dyspnœa, more or less urgent; sometimes fever, little or no cough, and little or no expectoration; the sibilous or sonorous rhonchus in the large tubes, and absence of the respiratory murmur over the chest; diminished resonance on percussion, the sounds of the heart being loud throughout the chest; anxious, pale, bloated, or slightly livid countenance; purplish tint of the lips and nails of the fingers; anhelation, &c. When the congestion takes place in the course of febrile or exanthematous diseases, in addition to these, the pulse becomes very quick, small, irregular, or intermittent, and the oppression at the chest extreme.

124. *B.* Congestions of the bronchi and of the lungs appear to be most frequently *caused* by exposure to great cold, by the inhalation of poisonous gases or effluvia; by close, overheated, and crowded apartments; by the ingestion of sedative or narcotic substances, or indigestible or poisonous animal or vegetable matters; by inordinate distension or oppletion of the stomach; and by the transition or metastasis of other diseases, or by their determination to the bronchial surface in a more especial manner. When this

affection proceeds from poisonous or indigestible substances, and frequently also when it arises from other causes, the substance of the lungs is chiefly affected. It often precedes other pulmonary complaints, as hæmorrhage, and that modification of asthma, called dry catarrh, by LAENNEC. Congestion of the bronchi and lungs also occurs in the progress of several diseases of the heart attended with obstructed or impeded circulation through its cavities, particularly those of its left side; and is often one of those changes which supervene in the advanced stages of several acute diseases, especially the exanthemata, and to which death is more immediately owing.

125. *C.* The *treatment* must depend upon the state of the vital energies at the time, upon the nature of the cause to which the congestion is owing, and on the evidence of existing general plethora. The state of the pulse, in respect of frequency and fulness, will indicate the degree of activity characterising the attack; but generally, when the congestion is considerable, the changes which take place in the lungs during respiration being impeded, the vital energies become proportionately reduced, and the pulse weak, quick, soft, or small. In the majority of cases it will be necessary, notwithstanding, to abstract blood by cupping; and if the depression of vital power be urgent, to exhibit simultaneously stimulants by the mouth, and in enemata; to employ frictions with irritating liniments, and revulsants, such as dry-cupping, sinapisms, blisters, mustard pediluvia, &c.; and to inhale, at brief intervals, and for a very short time, stimulating vapours, particularly those of ammonia, camphor, aromatic vinegar, &c., with the view of exciting the nerves of the bronchi, and thereby removing the distension of the capillaries, and accelerating the circulation through them. When, however, the patient, in addition to the symptoms indicating congestion, complains of a sense of heat, trickling, &c., in the course of the trachea, or under the sternum; and if the pulse retains its volume, and still more especially if it be sharp, full, or rebounding; we should infer that the fulness of the bronchial vessels is of an active kind, and that it most probably amounts to determination of blood; and possibly, is the early stage of hæmorrhage or of inflammation. In these cases, blood-letting, and afterwards counter-irritation and revulsants, mercurial purgatives, cathartic injections, the antiphlogistic regimen, &c., should be prescribed.

In every case a strict reference should be had to the cause, associated circumstances, and the complications of the attack, and the

treatment should be varied accordingly. When it seems to have been induced or aggravated by hurtful substances taken into the stomach, warm stimulating emetics ought not to be omitted, and if they do not operate immediately the stomach pump should be used. The bronchial congestion, preceding, accompanying, or consequent upon, eruptive fevers, requires revulsants, dry-cupping, rubefacients, stimulating frictions of the surface, and emetics. The congestion of the bronchi and lungs consequent upon obstructive cardiac disease demands serious consideration, and is rarely relieved by vascular depletion. Revulsants, restoratives, warm stimulating expectorants, tonics, chalybeates, &c., as advised above for asthenic and complicated bronchitis (p. 392 *et seq.*), are indicated for these formidable cases.

ii. OF BRONCHORRHEA.*

This complaint is *characterised by a flux of watery mucus or phlegm from the bronchi, with more or less cough and shortness of breathing, but without fever, often causing progressive exhaustion.*

126. A. PATHOLOGY. This affection varies considerably. It is often a variety of chronic bronchitis; being consecutive of it in persons advanced in life, or those of a relaxed and phlegmatic or pituitous habit of body. In other cases it appears from the commencement, or consecutively of slight catarrh, as intermediate between chronic bronchitis and humoral asthma. This appellation may upon the whole therefore, be viewed as applicable to those cases which are attended with a more abundant fluid, and transparent expectoration, than is observed in chronic bronchitis, and are devoid of fever and all other signs of inflammatory action, whilst they are equally without the severe dyspnœa, the paroxysms of suffocation and cough, and the intermissions, characterising humid asthma.

127. a. Bronchorrhœa proceeds generally from similar *causes* to those which produce common catarrh or bronchitis, even although it be not consecutive of some one of the forms of bronchial inflammation. It is very frequently, either at its commencement or recurrence, connected with cold moist states of the atmosphere, or occasioned by exposure to cold in some one or other of its forms. When it occurs as a sequela of bronchitis, it may be viewed as arising from lost tone of the vessels and of the bronchial surface, the

* Bronchial flux; Pituitous catarrh; Mucous flux.

flux or determination to this part still continuing, from peculiarity of habit or some other cause, after all inflammatory and febrile symptoms have been removed. Thus, it is very frequent in aged persons of relaxed fibres, who have experienced repeated attacks of pulmonary catarrh. Although sometimes appearing in the way now stated, it has occurred most frequently in my practice as a consequence of more or less congestion of the lungs consequent upon obstructive cardiac disease, especially of the left side of the heart; the causes now mentioned determining the morbid increase of secretion from the bronchial mucous surface.

128. *b. Diagnostic Symptoms.* — Bronchorrhœa may be distinguished from chronic bronchitis, tubercular phthisis, and humoral asthma, by the following characters:—The quantity of fluid expectorated is very great; being, in some cases, as much as four or five pounds in the twenty-four hours. The sputum is colourless, ropy, transparent, slightly frothy on the surface, and resembling the white of egg mixed with water. It is without the thickened sputa generally accompanying chronic bronchitis. There is considerable dyspnœa, with shortness of breathing even on slight exertion; there is often much dulness throughout the chest on percussion; and the cough, though sometimes slight, is often severe and suffocative. The sounds of the heart are often heard in distant parts of the chest, and the pulse is sometimes slow, intermitting, or irregular. In slighter cases the pulse and temperature of the skin are natural, and there are no night sweats. The appetite is generally unimpaired; and emaciation is not remarkably, or not at all observed, unless the quantity of the sputum be extremely great. M. NAUCHE states, that the expectoration in this state of disease is always more or less acid, and reddens litmus paper, whilst that proceeding from inflammatory action restores the blue tint to this paper after being reddened by acids. *On auscultation*, the respiratory murmur is commonly weak, and is sometimes nearly or quite suspended. The sibilous rhonchus is heard more or less distinctly, and often mixed with the sonorous, and occasionally with the mucous rhonchus, the bubbles of which seem to burst upon the surface of a fluid of less consistence than in bronchitis. The heart's sounds are sometimes so loud as to mask or render bronchial *râles* indistinct or confused.

129. Bronchorrhœa usually commences with catarrhal symptoms, and frequently without fever. In other cases, after bronchitis has continued chronic for a longer or shorter period, the expectoration becomes less consistent and less opaque, more abundant, and

similar to that described; and the affection becomes established,—aggravated at times by disorder of the stomach or bowels, or by changes of the air, especially by cold and moisture, or by arrest of the cutaneous transpiration from any cause,—and ameliorated at other times by a warm dry air, an open state of the bowels, and light nourishing diet, taken in moderate quantity. Vacillating in this manner, the disease may continue for years if it be not severe, without materially affecting the strength. But more frequently the discharge increases, after irregularly prolonged and more or less slight intervals; the patient loses his flesh, and becomes paler; his strength is impaired; dyspnoea increases; and, in some cases, the affection either runs into humoral asthma, or the quantity of expectoration is augmented so as to exhaust his energies, and to occasion suffocating paroxysms of cough. In rarer cases the quantity of the bronchial discharge has been so great as to occasion the exhaustion and death of the patient. M. ANDRAL has detailed two cases of this description, wherein, upon *dissection*, no evidence of inflammation or congestion could be found in the air-tubes. I had opportunities of examining the bodies of three cases of this disease after death. In all there were more or less congestion of the lungs, and obstructive valvular disease, with enlargement of the left side of the heart. M. ROCHE has described what he has designated an acute form of this affection, which other French pathologists have named *catarrhe suffocant*; but it differs in no respects from the more humoral states of asthma, complicated with cardiac disease, and presenting all the symptoms of spasm of the air-passages, with a copious viscid expectoration; the spasm and other symptoms subsiding after the bronchi and trachea are unloaded of the secretion accumulated in them. Bronchorrhœa has, in rare instances been the means of removing other diseases. M. ANDRAL states that he has seen hydrothorax disappear after the establishment of a copious bronchial flux.

130. *B. TREATMENT.*—After the full exposition that has been given of the means of cure in the different states of chronic bronchitis, to some of which bronchorrhœa is closely allied, it will be sufficient to enumerate succinctly the various means which are applicable to this affection. As the disease essentially consists of an increased secretion and exhalation from the respiratory mucous membrane, owing to congestion of the organs of respiration, and deficient tone of the vessels distributed to the bronchi, the obvious *indications are*, to impart power and tone to the heart's action, to increase the secretions from other surfaces and organs, and thereby

to derive from the lungs. I have never seen a case of the disease which has not been much relieved by purgatives; taking care, however, that they should not lower the energies of the constitution. They ought, therefore, to be conjoined with tonics, bitters, or stimulants, allowing sufficient light nourishment to admit of this mode of derivation being satisfactorily employed. In the intervals between the exhibition of purgatives, diuretics and diaphoretics may be exhibited, and the cutaneous functions promoted by constantly wearing flannel next the skin.

131. *Expectorants* have been very much employed in this affection; but some of this class of medicines are seldom of benefit in it, unless combined with opium. The *balsams* and terebinthines; the sulphate of iron or zinc, with myrrh, or the compound galbanum pill; and either of these, with camphor or opium, are often of service. Although astringents and inhalations may be required, yet we should be cautious in using them when the disease has been of very long continuance, particularly in persons advanced in age, or when there is any irregularity of the action of the heart, or physical signs of obstructive or other organic change of this organ complicated with it; inasmuch as the arrest of an habitual discharge will, in such circumstances, risk the supervention of effusion in the cavities of the thorax. It will be more judicious in these cases to confide in preparations of iron, in the decoction of senega, or other suitable expectorants; in purgatives combined with bitter tonics; in diuretics, and in diaphoretics, so as to moderate the discharge, and prevent its increase or its exhausting effects upon the system. At the same time the vital energies should be promoted by the preparations of iron or cinchona or quinine, or by tonics given with alkaline carbonates; by a light nutritious diet, moderate exercise, and change of air, with the sulphureous, chalybeate, and tonic mineral waters. In other cases, where the age of the patient, the regular or healthy state of the heart's action, the absence of leucophlegmasia, and the circumstances of the case altogether are such as to preclude dread of the consequences of suppressing this discharge, cold sponging the surface of the body by the nitro-hydrochloric lotion, &c. and the liniments already noticed, with the internal use of the more astringent tonics, particularly the sulphate of zinc or of quinine, in addition to the means already recommended, may also be prescribed.

iii. DILATATION OF THE BRONCHI (§ 68).

132. A. This alteration has been viewed as a consequence of, or an attendant upon, the more chronic cases of bronchitis, or of whooping cough complicated with bronchitis. ROKITANSKI has considered the dilatation to be caused by bronchitis of the terminal branches of the air-tubes, producing first obstruction of them and finally obliteration, dilatation following as a consequence. He takes into account the collapse of the air-cells of the portion of lung supplied by the obliterated capillary bronchi; and the space thus given to the bronchus by the collapsed and atrophied portion of lung, he believes to be the cause of dilatation. LAENNEC considered that the dilatation was the primary lesion and the condensation of the lungs parenchyma was consequent upon it. Dr. CORRIGAN, however, believes the disease to be analogous to scirrhus of the liver, and calls it therefore, scirrhus of the lungs. He supposes that the atrophy and obliteration of the pulmonary tissue is the primitive affection, and the dilatation a secondary result or consequence of this; arising not only from an attempt to fill up the space left vacant in the contracting lung, by the forcible expansion of the bronchi during the act of inspiration, but also by the mechanical dragging apart of the walls of the tubes from the shrinking of the pulmonary tissue itself. Bronchial dilatation, when considerable, owing to the collapse and atrophy of large portions of the lungs which attend it, causes more or less obstruction of the circulation through the lungs, consecutive active dilatation of the right ventricle, congestion of the venous system, and cyanosis by interrupting the changes of the blood in the lungs. The permeable portions of this organ are excessively developed, and their action being increased, bronchial and pulmonary hæmorrhage sometimes supervenes. Bronchial dilatations when slight, or not very extensive, are not easily detected, and even when very great, they may be mistaken for tubercular cavities owing to the physical signs, to the emaciation, dyspnœa, cough, and expectoration attending them. The marked cachexia, the partial cyanosis, and lividity of the countenance, lips, and extremities, the distended state of the veins, anasarca, &c., often indicate more extreme dilatation. The state of the expectoration is also important for besides being puriform and copious, it is often foetid—a diagnostic symptom of this alteration, without which M. LOUIS, and other pathologists who have devoted much attention to pulmonary diseases, have sometimes failed of distinguishing it from phthisis.

133. *B.* The TREATMENT of this alteration is nearly the same as that which has been recommended in the more chronic states of bronchitis. The means which are especially indicated consist of the *inhalation* of balsamic and terebinthinate fumes; of those of creosote, chlorine, iodine, &c. (§ 111 *et seq.*); the internal use of balsams tonics, and bitters, particularly the sulphates of quinine, or of zinc, or iron; and preparations of cinchona or steel; with the use of the liniments already noticed; or the nitro-hydrochloric acid lotion on the chest. The chlorate of potash, alkaline carbonates, tonic infusions or decoctions, the compound cascarilla mixture, &c., are indicated in this form of the disease. An open state of the bowels, an occasional cathartic, nutritious diet, and change of air, are also evidently required. In other respects, the treatment already detailed (§ 96 *et seq.*) may be followed; or modified according to the peculiarities of the case.

IV. ULCERATION OF THE BRONCHI (§§ 56, 57).

134. *A.* This is another alteration which is produced by, or is attendant on, the advanced stages of, chronic bronchitis; most frequently, however, when complicated with tubercular phthisis. It is often met with, particularly after bronchitis occasioned by the mechanical irritation of mineral, vegetable, or animal molecules. The existence of ulceration, when seated in the bronchi, is not indicated by any sign in addition to those which accompany the most chronic states of bronchitis, or tubercular disease, when it arises from or is complicated with, this change. When affecting the LARYNX or TRACHEA (see Part II.), it may frequently be suspected, or occasionally prognosticated. I have readily recognised it before death when occurring in the trachea; but have surmised it merely when existing near the bifurcation of the large bronchi, and then rather by the history of the case and the character of the expectoration than by any precise symptom or sign.

135. *B.* The TREATMENT of this lesion, even could its existence be ascertained during life, cannot be different from that required in some other states of chronic bronchitis. That ulceration may take place in the bronchi and heal, as evinced by the appearance of cicatrices, has been ascertained by LAENNEC and other pathologists. In addition to the means of cure already adduced, the establishment of local drains or derivatives of the most active kind is obviously required. Blisters and issues applied to a distant part have not been found of use by LAENNEC. When the latter are large and effective they may prove of more service. M. LAENNEC prefers the

repeated application of small moxas, as near the seat of disease as possible, and the preservation of absolute rest and silence. The inhalation of anodyne, balsamic, and terebinthinate fumes may likewise be tried; and the terebinthinate embrocation be assiduously applied to different regions of the chest in succession. If the disease be devoid of marked febrile excitement, the expectoration abundant, and the vital powers depressed, the treatment recommended for dilatation of the bronchi may be employed.



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