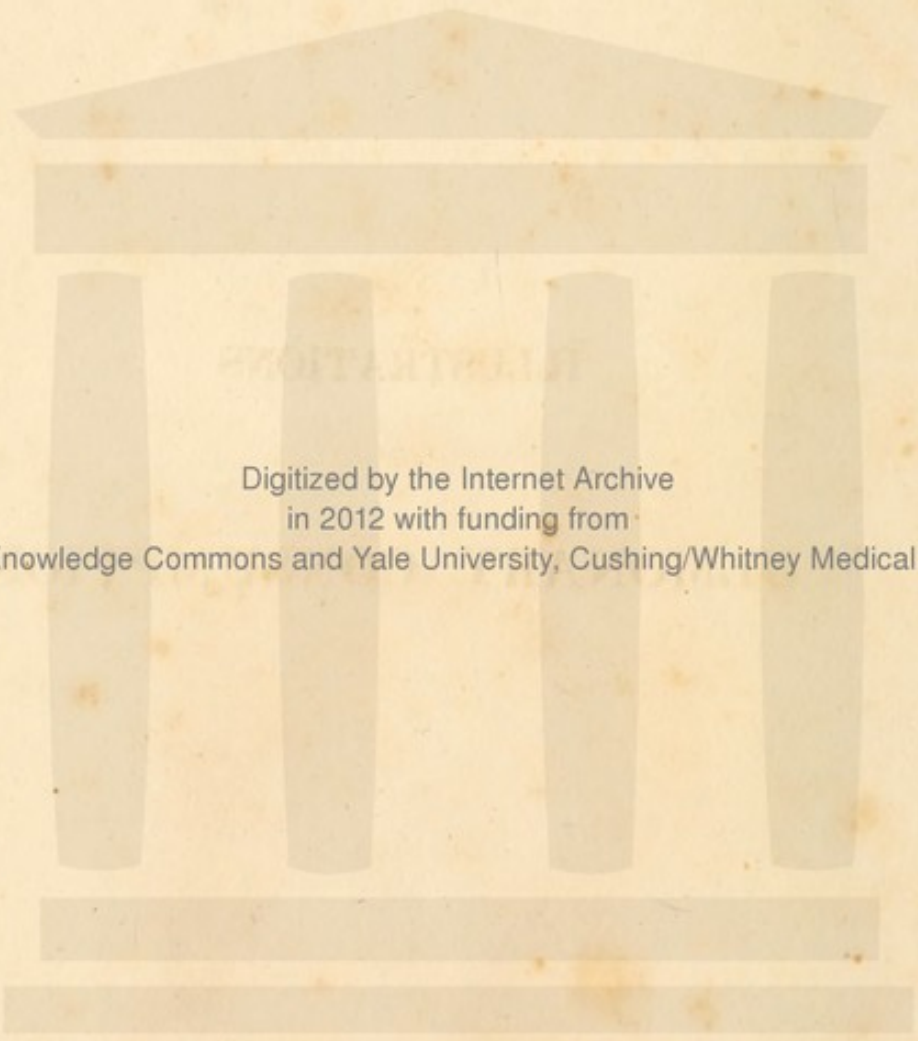
Illustrations of pulmonary consumption : its anatomical characters, causes, symptoms and treatment. With twelve plates, drawn and coloured from nature / By Samuel George Morton.



ILLUSTRATIONS

OF

PULMONARY CONSUMPTION.

Thos P. Anderson

1836.

ILLUSTRATIONS

OF

PULMONARY CONSUMPTION,

ITS ANATOMICAL CHARACTERS, CAUSES, SYMPTOMS AND TREATMENT.

WITH TWELVE PLATES, DRAWN AND COLOURED FROM NATURE.

BY SAMUEL GEORGE MORTON, M.D.

PHYSICIAN TO THE PHILADELPHIA ALMS-HOUSE HOSPITAL; LECTURER ON ANATOMY; MEMBER OF THE ROYAL MEDICAL SOCIETY OF EDINBURGH; OF THE PHILADELPHIA MEDICAL SOCIETY; OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF THE UNIVERSITY OF NEW YORK; OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, &c. &c. &c.

"Misera hæc tabes, sæva, atrox et insensibilis, teneros et amabiles depascens, cæde et luctu patriam implet."—GREGORY.

"A physician should consider his obligations to his profession and society undischarged, who has not attempted to lessen the number of incurable diseases. This is my apology for attempting to make CONSUMPTION the object of a medical inquiry."—RUSH.

PHILADELPHIA:

KEY & BIDDLE, 23 MINOR STREET.

T. K. COLLINS & CO. PRINTERS.

1834.

Philadelphia:
T. K. Collins & Co., Printers,
49 Prune Street.

TO

JOSEPH PARRISH, M.D.

OF PHILADELPHIA,

AND TO

SAMUEL JACKSON, M.D.

ADJUNCT PROFESSOR OF THE INSTITUTES AND PRACTICE OF MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA,

THIS WORK

IS MOST RESPECTFULLY INSCRIBED

BY

THE AUTHOR.

PREFACE.

The author of a new book may sometimes be compared to the voyager, who, after circumnavigating the globe, and viewing its mountains, islands, bays and rivers, returns home without having added much that is new to the chart he took with him: and yet, to continue the metaphor, we may, even under such circumstances, read the narrative with pleasure and instruction; for while it revives and confirms our previous knowledge, it perhaps throws some new light on remote and interesting objects.

It may be urged, that the subject of the following memoir has already occupied the ingenuity of so many able writers, as scarcely to leave room for a new idea: but a disease that has ever caused a large proportion of the mortality in almost all countries, and which attacks the human frame in every phasis of its development, from embryo existence to extreme old age, justly claims the untiring scrutiny of the physician.

It has often surprised me, that of the works of Bayle and Louis, we have no American editions. Dr. Forbes's translation of Laennec, is executed with admirable precision and elegance; and had it been republished in this country at the time the present volume was commenced, it is probable the latter would never have been offered to the public.

The work of Dr. Louis has not, to my knowledge, been translated into English: I am informed, however, that this very desirable object is likely soon to be realized, through the zeal and talent of my friend Dr. Gerhard.

It may reasonably be asked, what my opportunities have been for an inquiry of so much interest and difficulty, as that which forms the subject of this volume.

My attention was first particularly directed to the diseases of the lungs, by an attendance on the clinical lectures of the celebrated Laennec; who, with astonishing acuteness of mind, and personal urbanity, combined the faculty of imparting a portion of his enthusiasm to all who heard him.

On my return to this, my native city, I resolved to pursue with ardour an inquiry for which I had imbibed so strong an interest. But facilities are not always at our command; and before I was able to realize them, several years had already elapsed. At length, in 1829,

I received the appointment of physician to the Philadelphia Alms-house Hospital.

The wards of this institution habitually contain several hundred patients; exhibiting almost all the maladies to which man is subject, and especially those of a chronic nature, among which phthisis may be said to predominate. The deaths from this disease alone are little short of one hundred annually; and the facilities of pathological investigation in this institution are unrivalled on the American continent.

To these advantages I have added others, derived from an extensive private practice; and have long made it a rule to preserve the histories of my cases, and to avail myself of every opportunity of comparing the opinion I had formed during the life of the patient, with the appearances of the body after death.

From a large number of cases thus recorded, I have selected for this work, such as best serve to give an idea of the various conditions of consumption; and in many instances the cases are further illustrated by coloured plates.

On these lithographed illustrations I have bestowed the utmost attention; the preparations from which they were derived, were placed, as soon as obtained, in the hands of an excellent artist, and every character,

whether of organization or of colour, was immediately transferred to paper under my personal supervision.

In arranging the cases, many of which have chiefly an anatomical interest, I have, as a general rule, endeavoured to restrict the details to the points under consideration at the time, and to reserve whatever relates to the treatment of phthsis, for the last chapter: for it is obvious that unabridged histories of this kind would involve interminable repetitions, and extend the limits of this work far beyond the author's design.

In fact, my original plan embraced little beyond the pathological anatomy of the lungs; but year after year the subject expanded before me, until I have been induced to examine it in nearly all its bearings.

Thus, after the manner of Laennec and Louis, I have commenced with an examination of the anatomical characters of consumption, and have endeavoured to trace its changes from the incipient granule to open abscess. Some brief remarks have been devoted to its pathology, followed by a more extended view of its causes, symptoms and treatment.

Perhaps I should apologize for introducing the initiatory chapter on the morbid changes of structure which accompany phthisis, especially as the remarks

under this head are wholly elementary. But it occurred to me that even a brief notice of those changes might be acceptable to many whose avenues to pathological information have been limited; and especially as the chapter in question embraces some leading features in morbid anatomy, and principles of general application.

I much regret that with respect to the relative advantages of climate in different parts of this country, the details should be so meagre; but notwithstanding my sedulous inquiries for facts of this kind, I have met with comparatively little success, although I am sensible that many sources of information may have escaped my research.

A subject, however, of such paramount interest, cannot remain much longer uninvestigated; and I seize the present occasion to express a hope that the practitioners in various sections of the United States will give more attention to medical statistics, embracing especially the mean range of the thermometer, the prevalent diseases, comparative tables of mortality, the changes incident to the progress of cultivation and civilization, and an examination of the question, how far, in these varied localities, phthisis and scrofula appear to be conjoined.

Medical men attached to the army have great facilities for inquiries of this kind, and those who reside in the vicinity of the Indian tribes, have it in their power to communicate much valuable information. Dr. Rush, in his Medical Inquiries and Observations, speaks of consumption as a disease almost unknown among the aborigines of this continent; while the late Professor Barton maintained the contrary opinion, derived, however, as I have reason to believe, from the prevalence of scrofula among some of the more northern tribes.

Few inquiries are more interesting to medical men, than those which illustrate the influence of the refinements of civilized life in the production of disease; and in no instance can this question be examined with more interest than in reference to consumption.

As the result of several years of observation and reflection, I now submit this work to my professional brethren; and if in its pages they meet with fewer novelties than they could have desired, I trust they will at least award me the merit of illustrating an intricate subject in a conspicuous manner: for it has not been my object to originate a striking hypothesis, or to advance imposing novelty in practice: but rather

to convey, with reasonable brevity, the results of my own observation and experience, compared with the views of those who have preceded me in this inquiry.

I cannot conclude this preface without expressing my grateful thanks to those resident physicians of the Philadelphia Alms-house Hospital, whose aid will be more specifically acknowledged in the course of the following pages ; and whose professional zeal and intelligence have been of infinite service to me in the pursuit of my inquiries.

Finally, whatever acknowledgments an author can owe to his publishers, I owe to mine, more especially for their unhesitating liberality in meeting the heavy expenses inseparable from a work of this kind.

CONTENTS.

ILLUSTRATIONS

OF

PULMONARY CONSUMPTION.

CHAPTER I.

A BRIEF VIEW OF THOSE MORBID CONDITIONS OF THE LUNGS AND THEIR APPENDAGES, WHICH USUALLY CO-EXIST WITH PHTHISIS.

In examining the lungs of persons who have died of Phthisis, we almost invariably find the tubercular affection complicated with organic lesions of a different character. It would be foreign to the plan of the present work to enter into the details of these numerous diseases; the following remarks are consequently of an elementary nature, designed chiefly to enable the observer to distinguish tubercular matter from the morbid changes that accompany it. Most of these changes may be either causes or consequences of phthisis; although the nicest examinations do not always enable us to say which has been the primary, or which the consecutive affection.

PLEURISY.

Pleuritis. Inflammation of the pleura.—Acute Pleurisy is ushered in by severe, pungent, fixed pain, which is aggravated by every motion of the body, but especially by coughing and

speaking, and by efforts at full respiration. The patient is most at ease when lying on the sound side. The pain spreads rapidly from the point of origin, often extending over the whole side of the chest, and even to the opposite side; in the latter case the disease is called a *double pleurisy*.

If these symptoms are not soon relieved, the disposition to cough increases in common with an aggravation of pain, dyspnœa, &c. The countenance assumes an expression of great anxiety, is of a livid colour, and a sense of suffocation continues almost to the moment of death.

Pleurisy commonly produces one or more of the following morbid changes in the pleura: these changes, however, do not necessarily involve the life of the patient; for every day's experience goes to show that they are often followed by restoration to health.

Adhesions.—One of the first consequences of inflammation of the pleura, is an exudation, on its internal surface, of coagulable lymph, which is in fact the fibrinous* portion of the blood. This is considered by Laennec as a kind of suppuration proper to serous membranes.† It consists of a yellow, opaque exudation, at first not thicker than cream, but soon acquiring a firmer consistence. This appearance, which is the first stage of false membranes, is often in patches, or rounded granules on the pleura, other portions of the membrane presenting a spotted redness. The exudation soon becomes organized, firm, and almost inseparably attached, presenting most frequently the following characters:

Thread-like cords, and flattened bands, passing from one surface of the pleura to the other, diaphanous, and sometimes

* Chemical analysis has proved it to be pure fibrine: M. Andral suggests with great probability, that this principle constitutes the basis of all organized morbid productions, both in parenchymatous and membranous tissues.

† L'Auscult. Med. t. i. p. 331.

more than two inches in length. Their characters closely resemble those of cellular tissue.

Occasionally these cords attain a great thickness, and in some rare instances enclose adipose matter. (Pl. XI. fig. 2.) (*Case* 18.)

Again, it is not unusual to find the entire surfaces of the pleura closely and directly adherent, by means of numerous layers of cellular tissue resembling the pleura itself. This structure is admirably seen when it co-exists with general dropsy.

Finally, there is a species of false membranes of a fibro-cartilaginous consistence, which results from long continued irritation of the pleura. It is formed by successive deposits of lymph between the natural membranes, separating the latter widely apart, and even attaining the thickness of an inch. Its colour assumes various shades of yellow and white, with a tinge of gray. (Pl. XI. fig. 1. and Pl. IX.) This substance also assumes a spheroidal form, and may be readily mistaken for tubercles.

It sometimes occurs that the secretion of coagulable lymph is accompanied with an effusion of red blood; this constitutes the *hæmorrhagic pleurisy* of Laennec. (*Case* 14.)

Effusion.—Effusion into the cavity of the pleura does not necessarily follow the inflammation of that membrane, for it is often absent: but there is sufficient evidence that when it does occur it is mostly simultaneous with the inflammation itself, as Laennec has demonstrated. This fluid is sometimes in great quantity, compressing the lung and suspending its functions. (*Case* 26). It is serous, or sero-purulent, sometimes tinged with blood; it is also seen of a light wine-colour, and again of a milky or turbid hue, derived from the morbid secretions of the pleura, which are occasionally observed in floculent masses swimming in the fluid.

When, in consequence of a wound of the pleura, blood is effused into its sac, the disease is called *Hæmothorax*.

That kind of effusion which is occasioned by ulcerous perforation of the pleura, will be more particularly noticed hereafter.

PNEUMONIA.

Peripneumonia. Pneumonitis. Inflammation of the lungs.—Inflammation of the lungs generally commences suddenly with a chill, and pain in some part of the thorax, followed by oppression, difficult respiration, cough and expectoration of a viscid mucus, more or less mixed with blood. The skin becomes hot, the pulse full and frequent, the breathing laborious and hurried, and the anxiety extreme.

According to the duration of pneumonia, it induces one or several of the following pathological conditions:

1. *Engorgement. Engouement.*—Inflammation of the lungs is confined, at least in its acute form, to the cellular tissue of those organs which in the *first stage* is engorged with blood, rendering them more dense than natural, and of a livid colour with a violet tinge. The sero-sanguineous fluid shows freely from an incision. If in this state the lungs be carefully washed, they resume their crepitancy and other natural characters.

This stage is susceptible of perfect resolution.

2. *Red hepatization. Ramollissement rouge.* (Andral.) *Carnification.*—This condition marks the *second stage* of pneumonia: it is readily identified by its deep red colour, its firm consistence, and its solid appearance; the lung no longer floats in water; and, if torn, presents a rough, granulated surface, like that of the liver. (Pl. III. fig. 2.) When cut into, scarcely any moisture escapes; but if pressure be applied near an incised surface, a small quantity of sero-sanguineous fluid flows out. An incision also exposes numerous white points and lines, which

are unaltered portions of the blood-vessels and bronchial canals. I have known these points to be mistaken for tubercles.

This stage is also susceptible of entire resolution.

3. *Yellow hepatization. Purulent infiltration. Ramollissement gris.* (Andral.) *Suppuration.*—This is the *third stage* of pulmonary inflammation, and presents the following characters:

The lung is hard and granulated, as in the former stage, and has a remarkable straw yellow colour, mostly pale, but occasionally in young persons of a brighter hue. If the lung be cut, an opaque, viscid, yellowish fluid escapes, resembling pus. The yellow portions of lung are often interspersed with patches of red hepatization, giving the incised surface a marbled appearance, not unlike certain adipose conditions of the liver.

Resolution sometimes follows this stage of pneumonia.

4. *Induration. Induration grise et rouge.* (Andral.)—If, after hepatization has taken place, resolution does not follow, the lung gradually loses its red colour, and assumes a light gray tint. In some instances, however, it retains a dull red hue. This morbid structure is of a dense, dry consistence, often with a reticulated appearance from some remains of the air cells, and mostly interspersed with tuberculoid granulations. When incised it yields a sound not unlike that obtained by cutting a sponge. Tubercles frequently form in it. (Pl. IX.)

I cannot believe, with some authors, that gray induration ever results from simple chronic inflammation; but that, on the contrary, it is always preceded by acute inflammation, which not being resolved in its third stage, leaves the lung dense as in hepatization; the red globules and much of the granular structure having disappeared.

5. *Abscess.*—This is an extremely rare termination of simple pneumonia; so much so, that Laennec says he met with it but

five or six times in many years.* The parieties of the cavity are formed by the surrounding pulmonary tissue, and the cavities themselves are generally very small. In a great number of dissections I have but twice met with this condition of the lung. (*Cases* 32 and 33.)

6. *Gangrene* of the lungs is of comparatively rare occurrence, but may be readily detected by its greenish or black colour, strongly contrasting with the yellow hue of tubercles, and by its intense fœtid odour. Gangrene does not always follow pneumonia, but is sometimes an idiopathic affection.

It is an important fact, that pneumonia, in a vast majority of instances, commences in the inferior lobes of the lungs.

PLEURO-PNEUNONIA.

It is scarcely necessary to observe, that inflammation of the parenchyma of the lungs and of the pleura, frequently occur simultaneously,—a complication which embraces the morbid changes proper both to pleurisy and pneumonia.

BRONCHITIS.

Pulmonary catarrh.†—This disease, so familiar to us by the names of *cold* and *catarrh*, is an inflammation of the mucous membrane lining the air-tubes of the lungs. It is at once recognized by its red colour, in some instances extremely bright, in others dull and mottled. The mucous membrane of the nose is often first attacked, the inflammation consecutively involving the larynx, trachea and bronchia. When it passes to the chronic state, ulceration follows, which may be recognized by numerous small, irregular, white spots; these, when examined, are found to be partial excavations in the mucous

* L'Auscult. Med. t. i. p. 164.—Boisseau, Nosog. Organique, t. ii. p. 421.

† Called *Peripneumonia notha* by the older nosologists.

surface. (Pl. XII. fig. 2.) When this inflammation becomes chronic in the larynx and trachea, ulceration is sometimes deep and extensive, even destroying the cartilages, and causing those alterations in the voice so common in phthisis. (Pl. X.) The long continuance of catarrhal affections, especially that form of them called *chronic mucous catarrh*, sometimes occasions *dilatation of the bronchia*. In this pathological state, the air-tubes become preternaturally enlarged, their mucous membrane thickened, and of a violet hue. (*Case* 15.)

The mucous membrane of the bronchia is capable of secreting genuine pus; and it will be hereafter shown that there is a form of bronchitis so resembling tubercular disease of the lung, as readily to be mistaken for it.

ŒDEMA.

Hydrops pulmonum. Dropsy of the lungs.—This is an effusion of serum into the interstitial cellular tissue of the lungs: the latter, when examined after death, may be pitted with pressure like the surface of the body in anasarca; they are much heavier than natural; and on being cut and compressed, discharge a yellowish serum, after which they become again crepitant.

EMPHYSEMA.

Emphysema pulmonum. Pulmonary emphysema.—This is constituted by a distension of the air-cells in chronic catarrh, &c. The vesicles not unfrequently observed on the surface of the lung beneath the pleura, are caused by the escape of air from the cells within; the difficulty, however, of pressing the air back into the bronchia, led Dr. Bailey erroneously to suggest that it was secreted by the minute blood-vessels.*

* Morbid Anatomy, p. 47.

PNEUMOTHORAX.

The distension of the cavity of the pleura by air may originate variously, but in most instances is consequent to the absorption of the serum effused in pleurisy. The long continuance of such effusion presses the lung towards its root until permanent atrophy is established; if absorption is subsequently effected, the lung does not regain its bulk, and the serum is replaced by air. (*Case* 17.) In other instances the pleura is thus invaded from the bronchia, in consequence of ulceration. This affection appears also to be sometimes idiopathic.

HYDROTHORAX.

Dropsy of the chest.—This name is given to idiopathic dropsy of the pleura, and must be cautiously distinguished from effusion from pleurisy, or from perforation consequent to an ulcer in the lungs.

MALANOSIS.

Melanosis is the name given by Laennec to masses of a black, or blackish-brown colour, occasionally found in the lungs, especially in tuberculous persons. This matter, according to the later views in pathology, is merely an excess of secretion of the pigmentum nigrum, modified no doubt by disease; in fact, it seems to bear much the same relation to the pigmentum nigrum that tuberculous matter does to the healthy albuminous secretions of the pulmonary tissue. Melanosis is mostly seen in amorphous masses, or irregular laminæ, as represented (Pl. III. fig. 2), or in black spots in the cellular tissue immediately beneath the pleura. (Pl. XI. fig. 1.) It is sometimes encysted, and looks then not unlike a bronchial gland. Pathologists also speak of this secretion in the fluid form, a modification I have

not witnessed. I am disposed to think that melanosis is less frequent in this country than in Europe. In the Parisian hospitals, Bayle met with it in about a twelfth part of his autopsies.

CALCAREOUS CONCRETIONS.

These substances are frequently observed in the lungs and bronchial glands. They are mostly encysted (Pl. III. fig. 2.), and give a gritty sensation to the fingers. Their consistence, however, is much varied, and they appear to be an intermediate link between tubercles and bony concretions. Analysis shows them to consist of ninety-six parts in the one hundred of saline substances, the remainder being animal matter. M. Andral considers them tubercles that have undergone an earthy transformation, an opinion that requires further proof.

OSSEOUS CONCRETIONS.

Bony masses are frequently secreted by the arteries in the lungs and their appendages: in the former they are mostly rounded, and enclosed in a cyst; in other instances they have a rough surface, by which they are firmly attached. In the bronchia, they are branched in the direction of the air-tubes. In the glands they are often grouped.

DISEASED BRONCHIAL GLANDS.

These bodies are particularly subject to hypertrophy: when cut their substance is pulpy, traversed by white lines. They often contain tubercles, and calcareous and osseous concretions. (Pl. XII. fig. 2.) Again, they are occasionally softened, wholly or partially, into a yellowish, cheese-like substance.

Various minor pathological conditions of the thoracic viscera, will be noticed in the course of the following pages.

CHAPTER II.

ANATOMY OF TUBERCULAR MATTER.

Tuberculous matter presents itself in two very different forms, one of which is concrete, the other gelatinous: both of these varieties assume several different appearances.

MILIARY TUBERCLES.*

These are granules mostly of a yellowish or greenish gray colour, sometimes diaphanous, sometimes opaque, varying in size, under ordinary circumstances, from a fig-seed to a cherry-stone. They are either isolated or grouped, in the latter instance forming considerable masses; but if these be examined in their incipient state by reflected light, or with a glass, they are found to consist of an aggregation of the granules above mentioned.

These bodies are found on inspection to be extremely irregular in size; hence, in a state of aggregation, the masses are also extremely irregular, rounded, ovoidal, angular, stellated, &c. (Pl. I. II. III.)

Tubercles of this kind are sometimes in masses of a deep brownish-red colour, interspersed in others of a yellowish tint, giving the lung a marbled or mottled appearance. (Pl. I. fig. 2.)

It is obvious that pulmonary tubercles derive their gray

* *Grandines* of the older writers.

colour from the pigmentum nigrum, as Laennec has supposed; whence they are often of a much darker tint in advanced life, as seen in those that surround the encysted abscess, Pl. V. fig. 1.

When vast numbers of miliary tubercles reach the periphery of the lung, their rounded surface causes a partial displacement of the pleura; so that on removing the latter, the lung appears as if covered with a pustular eruption. (Pl. II. fig. 1.)

CRUDE TUBERCLE.

This is called the second stage of tubercular matter, and certainly it is so in reference to the diaphanous variety, in which the transformation commences by one or more opaque points, and ultimately involves the whole mass. When the change is complete, the tubercular substance has a yellowish white tint, a texture approaching cartilage, but more humid and less compact,* and when cut into it is smooth and polished. (Pl. II. fig. 3.)

It is certain, however, that tubercles often make their appearance in the opaque form, rendering the crude transformation, or rather the first part of the suppurative process, much less obvious. (Pl. I. fig. 2.)

GRAY INFILTRATION.

Matiere grise demi-transparente. (Louis).—It is common to observe masses more or less considerable, of a light gray, translucent appearance, smooth, moist and shining when incised, and seemingly dense, but breaking readily under the fingers. No trace of air-vesicles remains; here and there are seen opaque spots of various shades of white and yellow,

* Laennec, L'Ausc. Med. t. i. p. 22.

marking the progressive transition into the suppurative stage. Sometimes the crude transformation simultaneously pervades the whole mass. So also vomicæ form in various places, even while the surrounding portions still retain their original morbid characters. (Pl. III. fig. 1.)

This variety, like the following one, manifestly results from an abundant secretion of tuberculous matter through a large portion of parenchyma at the same time: masses very similar in appearance, however, result from the slower process of miliary accretions, especially when the latter, assuming an angular form, coalesce into a uniform mass, as may be inferred from Pl. II. fig. 2.

GELATINOID INFILTRATION.

This substance is in some instances harder, in others softer, than jelly. Its other physical characters vary greatly, it being sometimes semi-transparent and rose-coloured, but more commonly colourless, or grayish, or of an olive tint. It fills the interstices between common tubercles, or pervades the parenchyma in a homogeneous manner. In the latter state it often, when first secreted, resembles a mucilage, or more strictly the white of an egg, and has all the appearance of a nearly pure albumen, which it undoubtedly is. Although Laennec has given the name of *colloid matter* to this last variety, I am entirely satisfied that it is merely a form of tubercular disease, and of course subject to the same transmutations. (Pl. III. fig. 3.)

Thus I conceive that the hypothesis of Cruveilhier, which supposes tubercular matter to be primarily secreted in the fluid state, is not unfrequently realized.

The two subjoined cases afford some interesting facts in relation to this subject.

Case 1. *Phthisis with gelatinoid infiltration, and interspersed miliary tubercles.*—J. L., a weaver, aged forty-one years, black hair, dark complexion and much emaciated, had been confined in the lower cells of the Alms-house hospital for about three years, on account of lunacy. On the 3d of February 1833 this man was removed to the medical ward with a troublesome cough and extreme dyspnœa. He was immediately cupped over the chest, and blistered in the evening, but died the same night.

Autopsy, assisted by Dr. Mason, thirty-six hours after death.

Thorax. Right lung free, and contained a few tubercles towards the apex.

Left lung totally disorganized and adherent to the pleura costalis; its superior lobe was solidified by gray and gelatinoid infiltration; the latter was distinct from the former, of a pale violet colour and diaphanous: interspersed through it were great numbers of opaque, yellow points, the size and colour of fig-seeds, which were obviously the radicles of transformation into crude tubercular matter. The surrounding gray infiltration had already attained this change, portions of it having began to suppurate.

The remainder of the lung was occupied by a series of large cavities, communicating freely even to the diaphragm, and crossed in every direction by cords of condensed pulmonary tissue.

Bronchial glands enlarged.

Mucous membrane highly inflamed.

Heart firm, smaller than natural.

Liver not obviously diseased.

Other organs not examined.

Remarks.—The gelatinoid infiltration is an example of tubercular matter secreted in the semi-fluid form; it is evidently a rapid secretion, and appears in some instances to be converted into crude tubercle by a process almost equally rapid, until the lung becomes a dense, and seemingly inorganic mass, without a trace of respiratory structure. The following is a striking example:

Case 2. A. W., a mulatto female, aged thirty, was admitted into the Alms-house hospital towards the close of 1831 with a violent catarrh, and was a few weeks thereafter discharged cured. She was re-admitted in December 1832 with a troublesome cough, severe pain in the right

side of the chest, and profuse night-sweats: these appearances were successively followed by purulent expectoration, dyspnœa, œdema of the feet, and occasional hemoptysis. Her appetite was good, but her person emaciated and languid. The stethoscope detected cavities in the right lung, from its apex to its base; the gurgling of fluid in these cavities was so strikingly distinct, that I repeatedly called the attention of the clinical class to it. This woman lingered until April 20, 1833, when she died.

Autopsy, assisted by Drs. Simpson, Allen and Postell, seventeen hours after death. Body extremely emaciated.

Thorax. Right lung firmly adherent posteriorly; the superior lobe contained a large funicular abscess, the cords still slightly pervious, and obviously the remains of blood-vessels: this cavity communicated with others to the base of the lung; the entire lung around the cavities was infiltrated and solidified, the tuberculous matter being of various shades of rose or violet, gray and yellow—the latter colour forming the parietes of the cavities for a line or more in thickness, and pervading the mass in irregular spots and lines. This yellow matter was obviously the crude transformation of the violet or rose-coloured portion, which appeared to have originally infiltrated the entire superior lobe. The violet mass was diaphanous, in some places shaded with gray, and contained disseminated specks of black pulmonary matter. (Pl. VII.)

Left lung. Upper lobe tuberculous, cavernous, adherent: inferior lobe healthy.

Bronchial glands tumefied.

Bronchial mucous membrane inflamed.

Heart and *liver* natural.

Other organs not examined.

Remarks.—The preceding cases appear to afford satisfactory evidence as to the nature of gelatinous infiltration, and its eventual conversion into crude tubercular matter, as M. Laennec has shown: its existence moreover proves a strong tubercular diathesis, and a rapid tubercular secretion. In fact, I have seen it in one instance so abundant that I can only compare it to an albuminous œdema.

ENCYSTED TUBERCLE.

In a true encysted tubercle, the fibrous or cartilaginous envelope is visible before the softening of the contained mass, and

appears to have a contemporaneous origin with the tubercle itself. This extremely rare coincidence, of which Dr. Louis mentions but a solitary example, has presented itself several times in my dissections, and once in a remarkable manner.

Case 3. *Enormous encysted tubercle, &c.*—W. N., a black labourer, aged twenty-six years, with a rounded, full face, but meagre person, was brought into the Alms-house hospital June 29th 1833, in a state of partial stupefaction, but complaining of pain in both sides of the chest, and insufferable languor. I could only learn from him that this pain seized him three weeks previous, and was followed by cough and difficult breathing. He continued with these symptoms for about two weeks, when diarrhœa supervened and carried him off in a few hours.

Autopsy, assisted by Dr Postell, five hours after death. Great emaciation.

Thorax. Right lung firmly adherent above; the two upper lobes were loaded with tubercular matter in large masses, and mostly in the crude state: that in the superior lobe formed an ovoidal mass the size of a goose-egg, and was surrounded by a distinct, white, cartilaginous cyst, about a line in thickness: the cyst touched the pleura laterally, but was easily separable from it, the pleura itself being much thickened and adherent at these places. The thin edge of the lung towards the mediastinum, was filled with tubercles, but the cyst formed a perfectly distinct boundary between them and its own contained mass, which was of a grayish yellow colour, opaque, and mottled with darker points: its upper and posterior portions had already begun to suppurate, there being a number of small vomicæ that communicated freely with each other. (Pl. III. fig. 1.)

Left lung. Superior lobe tuberculous, and a small cavity beneath the apex.

Bronchial mucous membrane slightly inflamed.

Bronchial glands enlarged.

Heart natural.

Pericardium full of serum.

Other organs not examined.

Remarks.—I am at a loss to account for such a cyst, nor have I met with any satisfactory explanation of the phenomenon. It is not unfrequent to observe calcareous concretions

contained in firm sacs; but in such cases the small proportion of animal matter they contained having been evacuated into the bronchia, the earthy mass remains, and irritates and inflames the surrounding cellular tissue until a firm cyst is formed. A concretion and cyst of this description are represented, Pl. III. fig. 2.

Dr. Carswell* supposes that tubercular cysts are merely the distended parieties of the air-cells, an opinion which I cannot but think wholly gratuitous.

In another instance of a young man who died under my care, there were four or five encysted tubercles in the right lung, the envelopes being thick, firm and black, and the tubercular matter so firmly attached to their internal surface as to require considerable force to separate them.

TUBERCULOID GRANULATIONS.

Granulations miliaires. (Bayle.)—Bayle described these substances as different from tubercles, and I believe his distinction to be founded in truth. They are transparent or diaphanous, shining when cut, cartilaginous in their texture, mostly rounded or ovoid, and seldom larger than a grain of millet. When cut into, they appear each one to be contained in a distinct sac, from which it may be readily separated by a slight incision with the scalpel. Laennec and Louis consider them the first stage of tubercles; Broussais supposes them to be diseased lymphatic glands; while Andral ingeniously attributes them to the air vesicles of the lungs, dilated and filled up in consequence of inflammation. Of the truth of this last proposition I have little doubt, especially since Dr. Horner's† beautiful pre-

* Illustrations of the Elementary Forms of Disease, Part I.

† American Journal of Medical Sciences, February, 1833. Dr. Horner proves the air-cells to be about one-twelfth part of a line in diameter, and of a spherical shape, the cells of each lobule communicating freely, like the cells of a fine sponge, by lateral apertures.

parations of the air-vesicles have removed all ambiguity in reference to the size and form of the latter cavities, and their mode of intercommunication.

I have examined several persons after death whose lungs contained these granulations only, without any admixture of tubercles; and a striking example of their probable origin in the vesicular inflammation of pulmonary catarrh, occurred to me very lately.

A gentleman who had for several months been harassed with a dry cough, and whose uvula was greatly elongated, applied to me for relief. I removed his uvula, and the cough ceased entirely. This was three years ago. He died in August of the present year, of inflammation of the bowels, and as his family requested an autopsy, I availed myself of the opportunity of examining his lungs: the right lung, especially towards the apex, contained a great number of these granulations in the diaphanous state, but no tubercles, and the parenchyma was healthy. The left lung contained a few of the same bodies.

There can be little doubt that these substances were the remains of vesicles inflamed and filled up during the catarrh of which I have spoken. Had the catarrh been suffered to proceed, the granulations would have been developed in proportion, and their extensive accumulation would have constituted that state of the lungs which Bayle designated by the specific name of *granular phthisis.**

I am therefore inclined to believe that these substances hold the same relation to the gray induration of pneumonia, that tubercles bear to tubercular infiltration: and if they should be subjected to analysis (which I am not aware has ever been

* *Phthisie granuleuse.*—Sur la Phthisie, p. 26.

directed to these bodies in particular), they will probably prove to be composed of fibrine, and not, like tubercles, of albuminous matter.

Fig. 2, of Pl. III, represents a number of tuberculoid granulations of the ordinary size, in hepatized lung.

Disposition of the cellular tissue, &c.—This is certainly the least destructible of all the tissues; integuments, muscles, bones, rapidly disappear, but the cellular membrane that connected them together, often remains when they have left no trace. (*Case* 24.) It retains its organization when all surrounding parts are disorganized, and though infinitely separated into laminæ, still preserves an interstitial circulation* peculiar to itself. It is thus disposed in tubercular disease of the lungs; each tubercular molecule, though in itself inorganic, is embraced by an areola of cellular membrane, receives from the latter a kind of parasitic vitality, and is dependant on it for the whole series of changes from the miliary granule to open abscess. I have repeatedly detected the cellular tissue of tubercular masses, by placing the latter in alcohol when in a state of incipient suppuration; the spirit partially dissolves the softened tubercle, denuding, at the same time, the cellular areolæ, which present a

* "From the result of microscopical observations, little doubt rests on my mind, that a large proportion of what is regarded as capillary circulation, is not in fact performed by vessels. On the contrary, the blood circulates out of vessels, but in currents which are established in the globules and interstices, of which the ultimate structure consists. While examining the circulation in diaphanous tissues, we have the ocular demonstration of this fact. The currents of globules flow in every direction; I have seen currents of globules commence where none existed; and by the application of a mechanical irritant, I have seen the whole tissue become a mass of moving globules, pursuing every course with every diversity in their velocity. Dutrochet, speaking of the circulation of the salamander, mentions that he has seen the globules suddenly strike off laterally into the surrounding structure. He could not account for the manner in which they could escape from the vessels, though he declares he has observed the fact too often to permit a doubt as to its existence. There is no question that the observation is correct, and it is an additional evidence that the blood is not confined in closed vessels or tubes."—Jackson, *Prin. of Med.* p. 23.

reticulated, filamentous structure, subdividing the tubercle by innumerable septa.

It seems probable that even the capillary vessels of this tissue are obliterated very early in the disease; for, as will be explained hereafter, the visible arterial and venous trunks of which they are the fountains, or sources, lose their functions long before their final absorption. Perhaps the only appreciable circulation of tubercular masses, therefore, exists independently of capillary tubes, or in other words, is strictly parenchymatous.

The yellow colour of tubercles in jaundice, is obviously owing to the admixture of bile with the white blood; both being simultaneously circulated through the internal cellular tissue of the tuberculous mass. (*Case* 25.)

Analysis.—M. Thenard has obtained the following results from 100 grains of unsoftened tubercular matter:

Albuminous animal matter,	98.15
Muriate of soda, Phosphate of lime, Carbonate of lime,	1.85
Oxide of iron, a trace.	
	100.00

Remarks.—Tubercles are developed in all the tissues of the body except those of a horny consistence, and are peculiarly frequent in the lungs, where they constitute pulmonary consumption; or, in the words of Laennec, "tubercles in the lungs are the cause, and constitute the essential character of phthisis." In fact, in nearly all those who die of consumptive symptoms, the lungs present, as a principal lesion, a greater or less number of tubercles and tubercular abscesses.* M. Louis states that he never met with an exception; and but three unequivocal examples have fallen under my own notice. (*Cases* 32, 33, 34.)

* Recherches sur la Phthisie, p. 2.

The six species of phthisis suggested by M. Bayle,* are obviously mere complications of this malady with others, the former taking precedence in a vast majority of cases. Dr. Horner has proved this by a skilful analysis of M. Bayle's table of nine hundred cases, and shown that of the *tuberculous*, *granular*, *melanotic*, *ulcerous*, *calculous* and *cancerous* forms, the first three are but varieties of true phthisis, and "constitute ninety-eight and a half per centum of the whole."†

Laennec and Lombard (I quote the latter from Andral) have remarked tubercular disease most frequently in the right lung; which, however, is at variance with the observations of most other pathologists; for Bonetus, Morgagni, Stark and Louis have arrived at the opposite conclusion, which also accords with my own experience, as the following analysis of eighty-six cases will show:

Right lung most diseased in	28 cases,
Left lung	51
Both lungs about equally diseased in	7
	86

Of the preceding number, the disease was confined to the left lung in four cases, and to the right lung in a single instance only.

I once examined the body of a muscular man who died of fever; on the very apex of the left lung was a solitary gray tubercle, not larger than a hemp-seed.

ABSCESSES.

We have seen that sooner or later tubercular matter assumes the crude state, which is the precursor of suppuration. This change usually commences in the centre of spheroidal masses, but irregularly in those of an irregular form:

* Sur la Phthisie, p. 21. † Path. Anat. p. 245.

I have occasionally met with tubercles of a round or ovoidal form, that have begun to soften at or near their periphery. (Pl. II. fig. 3.) When the latter change commences in large masses by many simultaneous openings, enormous cavities are formed, having all the characters of abscesses in other parts, with certain peculiarities derived from the structure of the lungs. In other instances the abscesses are small, numerous or few, presenting a great diversity of physical characters.

1. *Simple abscess.*—In this variety the parietes of the cavity are chiefly formed by the pulmonary tissue, rendered rough and granular, of a reddish or yellowish colour, and communicating mostly with the adjacent bronchial tubes. Sometimes several such excavations intercommunicate, rendering the lung cavernous through its whole extent.

Although simple abscesses are often without a membranous lining, we more frequently meet with the latter coating the sides of the cavity, sometimes wholly, in other instances partially, and forming a smooth or granulated surface, of a dark livid colour. This membranous secretion, which is in some instances deciduous,* is obviously the origin of the following more striking arrangement.

2. *Encysted abscess.*—When phthisis is of long duration, and of slow development, the membranous parietes of the abscesses attain a firmness almost cartilaginous, and a thickness varying from half a line to more than an eighth of an inch. (Pl. V. fig. 1 and 2, and Pl. IX.) Such a cyst is mostly diaphanous, firmly attached to the lung externally, while its internal surface presents various inequalities, of a corrugated or granulated nature. These granulations are mostly yellowish, sometimes

* Dr. Heberden mentions a patient who appeared to have coughed up one of these cysts, and subsequently lived to a good old age.—*Comment.* p. 306.

red, and even of a bright blood tint. (Pl. V. fig. 2.) I even believe them to have, in some instances, an active share in hæmoptysis, as will be explained hereafter.

Encysted abscesses are of frequent occurrence in chronic phthisis, and sometimes attain a great size.

3. *Funicular abscess.*—In this variety the cavity is traversed by cords formed of condensed pulmonary structure, or of blood-vessels: they are of variable dimensions, from a line to nearly an inch in diameter, and mostly flattened. It was long ago suggested by Bayle that the rudiments or nuclei of these cords are invariably derived from the blood-vessels, an opinion that seems supported by the following facts, although Laennec has endeavoured to disprove it.

"Bands of condensed pulmonary tissue, somewhat resembling the *columnæ carneæ* of the heart, and charged with tubercular matter," says Laennec, "often traverse the cavities. These bands, thicker at their extremities than in the middle, have by some been supposed to be blood-vessels, and I believe M. Bayle himself to have shared in this mistake; for he remarks that the cavities are *often* crossed by blood-vessels,—a very rare circumstance in my own observations. On the contrary, I have never seen a vessel of considerable size traversing one of these columns."*

It has occurred to me, however, not unfrequently to meet with pervious vessels in tubercular abscesses, crossing them at various angles, and traceable, by means of a delicate probe, continuously into the trunks of the pulmonary arteries and veins. Examples of this kind, among many others that have occurred to me, are preserved in Pl. VII. A remarkable instance of the formation of the condensed bands around the

* L'Ausc. Med. t. i. p. 24.

ramifications of the pulmonary artery will be observed in Pl. IV. fig. 2. (*Case* 9.) Such an occurrence is remarked by Laennec to be extremely rare, and has been observed but five times by the indefatigable Louis.*

With respect to the blood-vessels which Laennec† mentions as traversing the parietes of the cavities, and thus forming a part of their structure, a striking instance is preserved in Pl. VI. (*Case* 22,) although in this instance the vessel was for some distance distinct from the sides of the abscess.

Contents of abscesses.—The cavities thus formed by the simultaneous or consecutive softening of several tubercular masses, are almost as variable in their contents as in their size and form. The contained matters consist of different grades of softened tubercles and of pus,—the latter being a more perfect condition of the former.

The softened tubercular matter of abscesses is opaque, of a caseous consistence and yellowish colour; it at first more or less completely fills the cavities, and is evacuated, as the disease advances, by one or more bronchial tubes, which, leading from the abscess, have their lining membranes continuous with it. The matter of abscesses is sometimes hard, dry, deposited in successive layers to considerable thickness, and peels off like the coats of an onion.

We often find small abscesses completely filled with this semi-fluid caseous matter; but after they have been once emptied, it is observed chiefly in irregular masses on their parietes, while the function of the cavity consists in the elaboration of a fluid which has all the characters of pus.‡

* Recherches, p. 12. † Loco citat.

‡ *Pus* is composed of yellowish albuminous globules, floating in a fluid resembling serum, and having the same shape as the red globules of the blood; it has been seen in every tissue, and even in the blood itself.—Andral, *Anat. Path.*

This purulent matter varies in its colour and consistence in the same way as in abscesses in other parts of the body; sometimes being straw-coloured, thick, inodorous and viscid; again thin and serous, sanguineous, ichorous, fœtid, &c.

This secretion escapes from the cavity by one or more fistulous ducts, the remains of bronchial tubes, through which it is transmitted to the trachea and thence expectorated. But it occasionally happens, that when suppuration occurs in the midst of extensive tubercular masses in which no bronchial tubes remain, the abscess may continue for a length of time imperforate; finally, however, it meets with a bronchial ramification, and I have known the egress of pus to be so great and so sudden as at once to strangle the patient.

Physicians, since the time of Hippocrates, had given the name of *vomica* to abscesses of the lungs consequent to pneumonia: Laennec, however, from the supposed infrequency of phlegmonous abscesses in those organs, restricts the appellation to the cavities formed by the softening of tubercles.

CHAPTER III.

PATHOLOGY OF PHTHISIS.

No fact is more familiar to pathologists, than that the apex of the lung is much more prone to tubercular disease than any other part: thus it often happens that while the apex of one or both lungs is filled with tubercles, or dense with infiltration, or even in a state of open abscess, the inferior portions are entirely free from disease. So uniform is this rule, that probably nothing but an accidental cause ever developes tubercular disease primarily in the inferior lobes. Louis met with but two exceptions in one hundred and twenty-three cases; and two have also occurred in my own practice. (*Case* 29.)

This fact has been variously accounted for; but I conceive that its real explanation is to be sought in the confinement, and consequent compression, of the superior lobes from the conformation of the cavities that receive them. These conical cavities are chiefly formed by the first rib and the spine; the former is broad, flat, and inclined to an angle of about forty-five degrees, having its anterior margin on a line with the lower part of the third dorsal vertebra, while its head is attached to the first. Thus placed, the upper rib dilates least of all, and may in fact be considered a fixed point:* the inferior ribs, on the contrary, possess successively an increased power of expansion,

* Horner, *Spec. Anat.* i. p. 103.

while the capacity of the thorax in that direction is greatly augmented by the diaphragm.

The confinement and compression to which the superior lobe is thus subjected, renders it peculiarly liable to sanguineous congestion; which, by perverting the organic functions of the lung, may be put down as the proximate cause of tubercular disease; a doctrine not advanced as a novelty, but adopted for its practical value.

Physiology shows us that in the healthy living body there is a constant secretion from the blood of an albuminous halitus, which is deposited in every part of the system, and in none so abundantly as the cellular tissue.

Whatever deranges this interstitial secretion, tends to the production of preternatural substances; hence any irritation may act as an exciting cause; not that it necessarily increases the activity of the secretory process (which in health is amazingly prolific), but because it perverts this important function.*

We have seen that tubercular matter consists almost wholly of albumen, proving its affinity to the healthy interstitial secretion, from which it differs mainly in certain physical characters already described.

Tubercular disease is by many considered a product of chronic inflammation; but although the latter frequently accompanies it, and always in its second stage, it appears to be by no means essential to its secretion, any more than to the deposit of osseous particles in the coats of an artery: for pneumonia is well known to attack those parts of the lungs least susceptible of phthisis, *viz.* their inferior lobes. And again, the product of inflammation, when it assumes the chronic form, has

* Andral, *Anat. Path.*

but little resemblance, chemical or anatomical, to tubercular matter.

Tubercles are often found in great numbers in the lungs after death, without their having been manifested by the usual symptoms during life; and if these tubercles have not passed to the crude state, the parenchyma around them is often perfectly healthy, presenting, in fact, no trace of any one of the stages of pneumonia. Could the pulmonary tissue maintain this integrity if each tubercle was a centre of inflammatory action? Inflammation appears, therefore, to be rather a consequence than a cause of tubercles; the latter forming independently of it, and subsequently inducing phlogosis like any other extraneous bodies.*

Tubercles, as shown by Andral, grow by the successive deposit of molecules around the primary granule, until the mass may occupy an entire lobe of the lung. What proves the fallacy of Laennec's hypothesis of growth by intussusception, is the fact that the black pulmonary matter is sometimes seen in the body of a tubercle. (Pl. II. fig. 3.) If tubercles are inorganic, they never could have secreted this substance, which, on the contrary, from its relative position to the rest of the tubercle, has obviously been surrounded in the parenchyma of the lungs by successive deposits of tubercular matter.

It has been already mentioned that each tubercular granule is enveloped by its appropriate tunic of cellular tissue, which at some period of phthisis takes on inflammation, and secretes pus. By this process the tubercular masses are completely disintegrated and softened, and mixing with the purulent matter, give it often a cheese-like, or curdy consistence. After a tubercle has thus become softened and removed by the interstitial

* Bayle, Laennec, Louis, &c.

secretion of pus, the cellular tissue that formed its tunic now forms the parietes of the abscess, and secretes the pus that is expectorated at subsequent periods of phthisis. If the tubercular mass has been circumscribed, and the inflammation of this cellular envelope protracted, the latter assumes a considerable thickness, varying, however, from a most delicate web to more than a line in thickness, and forms what is termed a cyst. These cysts, as we have previously observed, often completely isolate an abscess, leaving the surrounding pulmonary structure in a state to perform the respiratory function. (Pl. V. fig. 1.)

The manner in which the blood-vessels are destroyed in tubercular disease, has never, that I am aware, been satisfactorily explained. The result of many observations directed to this point, leads me to the following conclusions: the cellular tissue constituting the outer coat of the artery, secretes its own tubercular matter, and preserves the form of the vessel until suppuration takes place. The middle coat of the vessel meanwhile preserves its red colour; but between it and the internal coat a second layer of tubercular matter is observed, doubtless arising from a lamina of cellular tissue connecting those coats together. The inner coat, however, does not appear to change during the whole process of tubercular disease, but retains its pearly, diaphanous, and polished character. In order to trace this pathological condition of the blood-vessels, it is necessary to examine such of them as traverse a large tubercular mass, after the latter has become softened, but anterior to suppuration: if the vessels then be separated by cautious percolation with water, and a trunk be cut across, the several facts above mentioned will be rendered obvious. If, however, the examination be not made until after suppuration has taken place, the cellular tunic of the artery will be found to have granules or masses of tubercular matter adherent to it, not derived from

the contents of the abscess, but from its own proper tissue: the portions intermediate between these granules are of a florid red colour, and appertain to the denuded middle coat of the artery. This tuberculous degeneration of the blood-vessels is obviously derived from the vasa vasorum themselves.

The theory of the *lymphatic origin* of tubercles, which is now so generally received, is at least as old as Sylvius,* who supposed the lungs to contain an infinite number of minute conglobate glands, analogous to those of the mesentery; and that the inflammation and suppuration of these glands causes the vomicæ of phthisis. This opinion, which has been adopted by many physicians since the time of Sylvius, has more recently been amplified and illustrated with great ingenuity by M. Broussais. This pathologist attributes tubercular disease to an inflammation of the lymphatic glands and vessels, consequent to inflammation of the sanguiferous capillaries. "When inflammation," says he, "is developed in lymphatic glands, and passes to the chronic state, they become grayish, whitish, and sometimes semi-transparent, and have received the name of tubercles. If the irritation continues, it produces, in place of the pus of phlegmons, or albuminous exudation of membranes, a white, concrete, inodorous matter, of the consistence of cheese. Whilst the lymphatic glands are thus slowly disorganized, the irritation that destroys them is communicated to the surrounding cellular tissue, developing there vast numbers of tubercles, which probably result from the disorganization of the principal fasciculi of lymphatic capillaries." "This kind of degeneration occurs in all parts, especially in those designed for copious secretion, because they abound in lymphatics; and

* Sylvius wrote in 1671. I have not been able to procure his work, and quote his opinions from Dr. Young's learned Treatise on Consumptive Diseases, p. 178.

it presumes that the sanguine capillaries are but little irritated."*

In the language of Dr. Duncan, "each tubercle may be considered as a lymphatic gland in a particularly diseased state; that this diseased condition is the consequence of scrofula; and that the tuberculous phthisis may in every instance be considered a scrofula affecting the lungs."†

This hypothesis has long been the subject of voluminous discussion among pathologists: I have neither time nor inclination for a minute review of it in this place, and will merely suggest the following considerations:

If tubercles originate solely in lymphatic glands and vessels, ought we not more frequently to meet with them where these structures are most abundantly distributed, as in the axilla, and groin, the mesentery, neck, &c.? Yet, it constantly happens that in persons dead of phthisis, we see the bronchial, axillary and inguinal glands greatly tumefied, without being at all tuberculous; and we find the same hypertrophy of the bronchial glands in those diseases of the lungs in which tubercles have no part. Again, I have many times examined the bodies of children who have died of diseased and monstrously enlarged mesenteric glands, whose lungs were perfectly free from tubercles, and in every respect healthy.‡

The lymphatic origin of tubercles presupposes the existence of innumerable minute glands in the lungs; but anatomy, even

* Phleg. Chron. t. i. p. 28, &c. "La matiere tuberculeuse," says Goupil, "est le produit de l'exhalation des vaisseaux lymphatiques irritées; elle peut donc etre deposée partout ou ces derniers existent."—*Nouv. Doct. Med.* p. 48.

† On Consumption, p. 23.

‡ M. Louis, in three hundred and fifty post mortem examinations, found but a solitary instance in which tubercles existed in the other organs without there being any in the lungs.

aided by the microscope, has never detected them: moreover, a true tubercle has not, in any stage, the anatomical characters of a gland, for it is found in every instance closely attached to the surrounding parenchyma; whereas all glands, especially when enlarged by disease, possess their proper capsules, from which they can be dissected with the utmost facility.

With respect to the *hydatid origin* of tubercles, as maintained by the ingenious Dr. Barron, I confess myself unconvinced by his facts and arguments; but in the present infant state of pathology, it is more easy to doubt even this hypothesis than to disprove it.

The pathology of tubercular disease may, I think, be summed up in the following manner:

1. Tubercles are an altered secretion of the albuminous halitus proper to the cellular tissue* forming the parenchyma of organs.

2. Inflammation is not necessary to their development.

3. The cellular tissue which envelopes and intersects tubercles, sooner or later takes on inflammation, and secretes pus; by which process the tubercular matter is eliminated, and an abscess is formed.†

* Dr. Carswell considers the *mucous membrane* to be the most usual seat of tubercular disease, in which opinion I cannot coincide: on the contrary, most of the examples which I at first glance referred to that tissue, I found on closer inspection to be contained in the subjacent cellular substance.

† Dr. Williams (Phys. Signs, p. 170) states in a note, that Dr. Lombard explains the softening of tubercular matter "by ascribing it to the living portions of tissue that (as he has found) still pervade it." I have not been able to find Dr. Lombard's work in this city, none of our institutions being in possession of a copy. Dr. Williams does not state to what class the above mentioned portions of living tissue belong; but if Dr. Lombard alludes, as I can scarcely doubt, to the cellular membrane, then my observations, though made entirely independent of his, are confirmatory of the same pathological views. M. Andral appears also to adopt Dr. Lombard's opinion, without, however, giving any satisfactory explanation of it.—*Anat. Path.* t. i.

CHAPTER IV.

CAUSES OF CONSUMPTION.

Every observer, whether in the profession or out of it, has remarked that some persons are more predisposed than others to certain diseases, and that such predisposition will characterize a whole family, and descend from one generation to another. When we see that features, expression and complexion, even the qualities of the mind, are all so unequivocally transmitted from the parent to the child, we realize in externals what is equally true of the internal organization.*

When we see a man who has long indulged in every excess of the plate and the bottle, and yet has no gouty symptoms, we say very truly he has no predisposition to the disease; in other words, that his constitution is not of the peculiar structure that induces gout: on the other hand, we see persons of most abstemious habits who suffer from it all their lives.

The same remark will apply to consumption, to scrofula, to some of the exanthemata, &c.; for with respect to the first of these, I have seen the external tuberculous characteristics, joined to excessively curved spine, chronic bronchitis, purulent expectoration, and almost incessant cough, terminating in

* Hujusmodi varietates non corporis modo, verum et animi quoque, plerumque congenitæ, nonnunquam hereditariæ observantur. Hoc modo parentes in prole reviviscunt; certe parentibus liberi similes sunt, non vultum modo, et corporis formam, sed animi indolem, et virtutes, et vitia."—Gregory, *Cons. Med. Theor.* ch. i. sec. 16.

death, without developing a solitary tubercle in either lung. (*Case* 34.)

Let us next inquire, what are the physical characters of the tuberculous diathesis? From time immemorial they have been supposed to consist in a fair skin, light hair, blue eyes, thick lips, long neck, narrow chest, projecting shoulders, and meagre person; and yet even in this country, where fair features greatly predominate, my observations are so far from confirming this rule, that almost two-thirds of the phthisical patients* who have come under my notice, have had dark hair, dark or sallow complexions, and dark eyes. Of the remaining third, a large number had reddish hair, and what is called the sandy complexion. With respect to the conformation of the chest above mentioned, I have met with very many exceptions to this also. It seems, therefore, extremely difficult to detect the tuberculous constitution† by any physical characters of even general application; and still more difficult to identify it with the scrofulous diathesis.

Let us in the next place inquire into the *exciting causes* of phthisis.

Bronchitis.—I agree with Broussais in considering chronic catarrh a frequent cause of tubercle; not, however, by the propagation of the inflammatory action from the mucous membrane to the parenchyma, (for bronchitis is remarkably independent of pneumonia), but by the interruption it opposes to those profuse healthy secretions upon which the integrity of the lungs depends. That bronchitis is often a consequence of tubercles is equally obvious, the primary irritation originating in the latter.

* Negroes are of course left out of the calculation: their predisposition to phthisis, however, is familiar to every American physician.

† *Tubercular cachexy* of Dr. Clark.—*On Climate*, p. 236.

A large proportion of consumptive patients are able to trace the first appearance of disease to some exposure to cold or wet, an incautious change of dress, &c., followed by a *cold* which was neglected until the symptoms became severe, complicated and unmanageable. I think, with Broussais, that if the catarrh appears to be accidental, the tubercles cannot be accused of having produced it. Those who, with Laennec and others, deny the agency of bronchitis, appear to do so from the fear of admitting the propagation of inflammatory action from one tissue to the other,—for which, as before observed, there is no necessity whatever.

The following case, which I watched with care from its commencement to its termination, affords some interesting facts in relation to the point *sub judice*.

Case 4. *Measles, followed by catarrh and pleurisy, and terminating in phthisis.*—A young lady in her seventeenth year, of a clear complexion, dark hair and eyes, and seemingly good constitution, was attacked with measles in the month of March 1829. The disease was severe, and notwithstanding the active use of the usual depletory and other measures, left a troublesome cough. At a short subsequent period, an incautious exposure on a wet, snowy day, caused a great aggravation of the catarrh, followed by acute pleurisy, with which she continued several weeks ill. The pain was particularly severe in the right side, from the region of the liver to the top of the shoulder: cough dry, aggravating the pain, and attended with slight, frothy expectoration. The patient slept mostly on her right side. Stomach extremely irritable, with severe headache, and almost constant fever. All these symptoms were so far relieved that the patient was able to go into the country in the month of April. The hectic fever, however, continued, with loss of appetite, extreme debility and more or less pain in the side and head. Under these circumstances she returned to the city, the symptoms continuing with various intermissions until the 12th of June, when the patient suddenly and unexpectedly died.

Autopsy, assisted by Drs. Parrish and Hartshorne, twenty-four hours after death. Considerable emaciation.

Right lung firmly adherent in patches from base to apex; these adhesions were in some places red and membranous, in others albuminous and granulated. The non-adherent portion of the pleural cavity was occupied by a turbid serum, tinged with blood. On incising the lung, all its lobes were charged with tubercles, many in the crude state, but no vomicæ: these bodies were pretty equally distributed through the lung, the apex not being particularly involved: no parenchymatous inflammation.

Left lung slightly adherent, tuberculous, but no effusion in the pleura.

Bronchial mucous membrane inflamed throughout.

Heart natural.

Liver adherent by delicate organized membranes, and filled with spheroidal tubercles, especially the right lobe.

Stomach apparently healthy; but as the autopsy was made at night, there might be some fallacy in this respect.

Remarks.—I give the history of the preceding case with fidelity, and am aware that Laennec, Broussais, and Gendrin might each explain the phenomena differently. To me it has always appeared that the *catarrh* developed the tuberculous affection; for until the former appeared there was no symptom of the latter, and no known predisposition from family inheritance or physical conformation. How much agency the pleurisy had in this instance I will not attempt to decide; but my observations lead me to believe that affections of the pleura, unattended by pneumonia, very rarely excite the tuberculous secretion.

It would be easy to multiply cases more or less analogous to the preceding; in fact, as already stated, a majority of consumptions afford the same initiatory symptoms. Does not catarrh, or rather its attendant *cough*, act chiefly by mechanical means in the development of tubercles? In other words, may not the frequent and violent compression of the lung—especially its apex—so far derange the respiratory and cir-

culatory functions, as to cause congestion and tubercular secretion?

Bronchitis, however induced, appears to tend to the same result: thus, men who work in flax-mills; those who inhale dust and mineral spiculæ in the iron trades; workers in lime, charcoal, &c. &c., become catarrhal by direct irritation of the bronchial membrane,* and are very subject to consumption.

Pneumonia appears to induce phthisis in two ways: 1st, By interrupting and depraving the secretions of the lungs, which is probably a rare result of acute inflammation; 2d, By producing preternatural tissues, as *gray induration*, &c., in which no inflammatory process remains, but which have a constant tendency to tuberculous derangement. It is, in fact, a rare circumstance to find the gray induration without tubercles, the latter often appearing in their incipient state, where the former may have existed for months, or even years.

There is another series of causes that acts primarily upon the apex of the lung, producing congestion, which is often rendered unequivocal by the appearance of hæmoptysis. Among these causes may be enumerated, excessive muscular exertion in lifting, running, boxing, rapidly ascending stairs, &c. Also, loud and continued vociferation, whether in singing, laughing, shouting, or speaking; also the blowing of trumpets and other wind instruments.

Let me repeat, that in such efforts the respiration is temporarily suspended, and of course with it the arterialization of the blood, while the latter fluid rushes to the lungs in greater quantity and with greater velocity than ever. An apoplectic

* The Effects of the Principal Arts, Trades, &c., on Health, by G. T. Thackrach.—Traité des Maladies des Artizans, par P. Patissier.

and congested state is the consequence, sometimes accompanied by hæmoptysis, at others by a rapid succession of alternating chills and heats, excessive languor, &c.

It is common to ascribe consumption to the hæmoptysis, whence the *phthisis ab hæmoptoe** of the older nosologists; but this is only an indication and consequence of congestion, and can in no way be proved to cause it: again, the congestion often occurs without being followed by hæmorrhage.

The lungs, moreover, are liable to become congested by all sedentary occupations; thus literary men, clerks, shoemakers, tailors, weavers, and some others, contribute largely to the list of consumptive persons. I have observed weavers to suffer more than others, probably from their having to contend with a double exciting cause—a fixed position of body, and the constant inhalation of particles of the materials in which they work.

There is another source of consumption, the more to be deplored because it is sanctioned by the tyranny of fashion: I allude to the custom of *tight lacing*. It is well known that this practice, if commenced in younger life, and persisted in, greatly diminishes the lateral diameter of the chest, and necessarily cramps the lungs, deranges their functions, and disorganizes their structure. In those who are predisposed to consumption, I cannot imagine a more certain mode of inducing it. (*Case* 28.)

Cold and damp situations, by checking healthy perspiration, and consequently disordering the visceral secretions, are fruitful causes of phthisis. I have at different times examined the

* "Ex sanguine sputo," says Hippocrates, "puris sputum et fluor."—*Aph. Sec. vii.* 81. Cullen describes phthisis as a species of the genus *Hæmoptysis*.—Vide *Synop. Nosolog. Method.*

bodies of six lunatics, each of whom had been confined from one to three years in the lower cells of the Philadelphia Almshouse hospital (which are extremely humid and cold), and in all of them found the lungs excessively disorganized; in five by tuberculous disease, and in the sixth by chronic pleurisy and catarrh.

Vicissitudes of climate, sudden changes from heat to cold, or the long continuance of cold or wet weather, produce similar results; and it seems as if habit in this instance has little or no preventive influence, inasmuch as the native inhabitants of the northern latitudes of both Europe and America are, with certain exceptions, extremely liable to this disease.

Whatever tends to debilitate the vital energies and undermine the constitution, opens the way to phthisis; among these causes the depressing passions are conspicuously active. Of this fact Avenbrugger has given the following melancholy illustration. "When young men, not yet arrived at their full growth, are forcibly impressed into the military service, and thereby lose all hope of returning to their beloved country, they become sad, silent, listless, solitary, musing, and full of sighs and moans, and finally quite regardless of all the cares and duties of life. From this state of mental disorder nothing can rouse them,—neither argument, nor promises, nor the dread of punishment; while the body gradually wastes away under the pressure of ungratified desires. This is the disease called *nostalgia*. I have examined the bodies of many youths who have fallen victims to it, and have uniformly found the lungs firmly united to the pleura, and the lobes callous, indurated, and more or less purulent."*

* Dr. Forbes's Trans. of Avenbrugger, p. 24.

I think I have observed that lunatics of the melancholic temperament are very prone to phthisis; whilst those of a gayer disposition, and who use much exercise, more frequently live to old age.

Some authors have insisted on the contagious nature of phthisis; but no case that I could attribute to such a source, has come under my notice. The hereditary predisposition will amply account for its appearance in several individuals of the same family successively; and in others it can be traced to the constant watching, anxiety, grief and other circumstances which often prey on those who administer to the necessities of protracted disease. Yet a remarkable instance occurred to me, which may be mentioned in a few words: I attended the wife of an innkeeper in chronic consumption; she died after having been ill for nearly two years. Her husband was a short, athletic, florid-complexioned man, the very reverse of what we usually see in phthisis, and yet he also died of that disease six months after his wife. I look upon this case as an accidental coincidence, yet one which would by some be referred to contagion.

Influence of age.—The observations of the practitioners of all ages have confirmed the opinion of Hippocrates,* published nearly four hundred years before the Christian era, viz., that the period of life most liable to consumption, is between the eighteenth and thirty-fifth years.

Without attempting to prove what every one must concede, I will merely add, that in the three years and a half ending with the month of June 1833, there died of phthisis in the Philadelphia Alms-house hospital, 331 persons. Of those whose

* Tabes iis maxime ætatibus fiunt, quæ a decimo-octavo anno sunt usque ad tricessimum-quintum.—*Sec. viii. Aph.* 7.

ages could be satisfactorily ascertained (281 of the entire number), I have preserved the following memorandum.*

Under one year,	3
From one year to ten,	1
From ten to eighteen,	4
From eighteen to thirty-five,	142
From thirty-five to forty,	51
From forty to fifty,	42
From fifty to sixty,	20
From sixty to seventy,	12
From seventy to eighty,	3
From eighty to ninety,	2
From ninety to one hundred.	1

Thus it would seem that more patients die between the ages of eighteen and thirty-five, than in all the other periods of life conjoined. I am confident, however, that many children die of real phthisis whose deaths are attributed to other causes; for there is a difficulty attendant on their autopsies in our public institutions that amounts to a prohibition.

M. Lombard,† of Geneva, has shown that tubercles are much more common between the ages of four and five years than at any other period of childhood, and, in fact, up to this epoch are extremely rare.

Cases have occurred of tubercles in the fœtus; and in the following case, in which the patient was less than a month old, I strongly suspect the tubercular development commenced before birth.

Case 5. *Tubercles in the lungs of a child within the month.*—A male infant, aged twenty-eight days, died in the Philadelphla Alms-house hospital, June 3d, 1833, of congenital strangulated hernia.

* There are slight numeral differences between the Alms-house record of deaths from phthisis and my private memoranda, arising from this fact—patients were occasionally recorded by the resident physicians as dying of marasmus, debility, diarrhœa, bronchitis, &c., which a post mortem examination proved to be symptomatic affections of phthisis.

† Andral, *Anat. Path.*

Autopsy, assisted by Drs. Porter, Bacon and Thornton.

Both lungs were free, but the left one contained in its lower lobe a number of tubercles, the largest the size of cherry-stones. Most of them were immediately beneath the pleura, of a yellow colour, and surrounded by areolæ of red, condensed pulmonary tissue. The apices of the lungs, contrary to what is usually observed, were healthy.

Right cavities of the heart dilated.

Other organs natural, excepting the left testicle, which was highly inflamed, and firmly adherent to a portion of the ileum.

Case 6. *Tubercular abscesses in the lungs of an infant three months old.* A meagre and extremely delicate child, afflicted from its birth with cough, distress and inanition, died on the 23d April, 1833.

Autopsy, assisted by Drs. C. A. Porter, Postell and Muhlenberg. Extreme emaciation.

Right lung filled with crude tubercles, and an abscess the size of a large filbert in the middle lobe; this cavity was partly filled with thick pus, and presented a large perforation through the pleura, which contained a little discoloured serum. The lung around the perforation (which was recent) was highly inflamed, and surrounded by a ring of coagulable lymph.

Left lung. A funicular abscess towards the apex, almost as large as a hen's egg; the cords were numerous, crossed the cavity in all directions, were still pervious, and by means of a wire were traced to the pulmonary artery; their surface was enveloped by yellow tubercular matter, interspersed with red granules. Several vomicæ and numerous tubercles in both the inferior lobes.

Liver and *heart* healthy. *Mesenteric glands* much enlarged, with a few disseminated tubercles.

Brain. Considerable effusion in the ventricles.

Remarks.—It is probable that the immediate cause of death in the above case, was the violent pleuritis consequent to perforation of the lung.

Numerous observations have proved that in the period from birth to the fifteenth year, fewest tubercles are found between the first and second years.

After puberty, tubercles attain an additional development,

especially in the lungs, intestines, and some parts of the lymphatic system.*

Influence of sex.—I am unable, from personal observation, to venture a decided opinion on this subject. Most authors, however, consider women more liable to phthisis than men.

The symptoms of consumption are generally arrested, or at least greatly mitigated, during pregnancy, owing "to that powerful excitement which the uterus receives at this critical and important period, by which the irritative pulmonary actions are subdued, and the impetus of vascular action directed into another course."†

* Andral, *Anat. Path.*

† Reid, *On Consumption*, p. 243.

CHAPTER V.

SYMPTOMS OF CONSUMPTION.

Consumption has been generally divided into two stages, the *incipient* and the *suppurative*. That these epochs do occur in a great majority of cases there can be no doubt; but patients occasionally die from the irritation of a vast congeries of tubercles, before these have advanced to the second stage (*Case* 8): again, tubercles sometimes run on to suppuration, abscesses form, and the patient dies without having experienced any marked symptoms of the disease, which is only revealed after death. Yet as the distinction referred to has its uses, I shall retain it.

The first, or incipient stage, is usually marked by some or all of the following characters: a short, dry cough, with dyspnœa, pain at the scrobiculus cordis, or in some other part of the chest; febricula, with dryness and burning heat of the palms of the hands and soles of the feet; lassitude, and corresponding fatigue after slight exertion; florid lips, hectic flush of one or both cheeks, and hæmoptysis.

In the *second stage* the cough becomes more violent and more paroxysmal, accompanied by muco-purulent expectoration, often streaked or mixed with blood; sense of weight and oppression in some part of the chest; respiration short, greatly accelerated by slight efforts; hectic regular, with evening exacerbations and night-sweats; slight erratic pains in the chest,

or between the shoulders; tormina; emaciation; shrivelled skin; œdema of the feet; apthous mouth; sore throat; loss of voice; hippocratic countenance; incurved nails; eyes glistening and pearly; diarrhœa, and extreme exhaustion.

The emaciation becomes extreme even while the appetite is unimpaired: the latter is mostly good, sometimes inordinate. The dyspnœa is often less in the second than in the first stage, but the throat suffers more, and deglution is often painful. Hæmoptysis, in a certain proportion of cases, is wholly absent, even where it may have occurred repeatedly in the first stage.

The complexion varies strikingly in the course of a few hours, presenting the hectic flush at one time,—an earthy paleness at another: again, in persons of a sallow complexion, there is often a livid hue, which, in combination with the shrunken features, gives the countenance a ghastly expression.

The skin is either harsh and dry, or covered with a perspiration so profuse and clammy as to become concrete on the surface of the body.

It often happens, however, that several of the preceding symptoms are wanting; sometimes all. (*Case* 13.) Again, physicians have proposed other appearances as characteristic of phthisis, which I suspect are entirely accidental. Thus Dr. Withering and Dr. Darwin insist on an unusual magnitude of the pupil: I have examined nearly one hundred patients in reference to this particular, and satisfied myself that it is wholly attributable to the darkness of the chambers in which patients are habitually kept when very ill. Dr. Foart Simmons asserts that he rarely found a consumptive person with a carious tooth,—a remark for which I can discover no foundation.

With respect to the more prominent and diagnostic symptoms of phthisis, I now proceed to offer a further exposition.

Cough.—The cough in the first stage, as already stated, is dry, or attended by slight mucous expectoration. It is almost constant, unless allayed by opiates, and is worse at night. When suppuration has taken place, the contents of the abscesses are of course excreted through the bronchia, and the cough is generally in proportion to the purulent secretion, and always accompanied by it.

It is well known that patients sometimes die of consumption without having been troubled with cough; in other cases it ceases sometimes before death.

Case 7. *Disappearance of cough nine days before death, and remarkable absence of the other symptoms of phthisis.*—John Brady, a mulatto hostler, aged twenty-nine, was admitted into the Philadelphia Alms-house hospital in December, 1832, with a troublesome cough, extreme languor, and corresponding mental hebetude. He remained in the house all winter, and came under my care on the 1st of February, 1833. Complains of nothing but inordinate fatigue and weariness; assures me that he has never had hæmoptysis, pain or night-sweats, nor have any of these symptoms been noticed since admission: coughs considerably, but does not appear to be distressed by it. Expectoration scanty. The stethoscope proves the respiration to be very dull in the upper half of the left lung.

February 6th. Cough and expectoration less than ever. Lethargic and almost unconscious.

February 8th. Cough and expectoration have ceased. Complete aphonia.

February 10th. Somewhat revived, but cannot speak. Retention of urine, which flowed freely through the catheter. Appears to suffer pain in the lumbar regions when moved. Involuntary fœcal evacuations.

February 14th. Pulse better; voice returned so as to be intelligible; urine and fœces under controul of the will, but no cough; has, however, subsultus tendinum, facies hippocratica, and the same languor which has induced him to lie in one position, on his back, for nearly two weeks past.

February 17th. Died.

Autopsy, assisted by Drs. Mason and C. A. Porter.

The *right lung* was free, and charged with tubercles in all its lobes, but especially in the upper one; no vomicæ, and no infiltration.

Left lung adherent throughout by slight membranous laminæ, and literally filled with tubercles in every stage of development, from minute granules to vomicæ, though the latter were mostly not larger than a small filbert. This lung could have subserved no part in the respiratory function for a considerable period before death.

Heart natural.

Liver, kidneys and *bladder* healthy.

Remarks.—This case is highly interesting, inasmuch as it proves to what extent tuberculous disorganization may proceed in the lungs, without producing the usual symptoms of phthisis.

Louis* mentions the case of a patient who died of consumption without having had either cough or expectoration, although there was hectic and hæmoptysis: both lungs were tuberculous, and one of them had a cavity. I shall hereafter narrate (*Case* 13) an almost entirely analogous example. Dr. Dewees, however, has justly observed, that a cavity proves the existence, at some time or other, of pus, and therefore that there must have been expectoration, although it escaped notice.

The sudden and entire cessation of cough is to be accounted for in one of three ways; first, the inability of the patient to expectorate the secreted fluids, which are hence retained in the bronchia. Such I conceive to have been the case with my patient above cited, whose most prominent symptom was extreme languor. 2. This phenomenon may also temporarily result from perforation of the pleura, owing to the escape of the fluids into that sac. 3. The secretory function of the bronchial mucous membrane appears to be sometimes wholly suspended.

* *Recherches*, Obs. 32. Morgagni gives similar examples.

M. Andral and others, also refer the cessation of cough to the absorption of the purulent secretions: of which, however, I have seen no unequivocal instance.

Case 8. *Cessation of cough too weeks before death; fatal termination from a vast congeries of unsoftened tubercles.*—John Faust, a Rhenish German, aged twenty-two years, light hair and complexion, blue eyes, narrow chest, emaciated person, came under my care in the Philadelphia Alms-house hospital, February 1, 1833. Says that he has been for more than four months in poor health, with pain at the inferior margin of left side of thorax, inconsiderable cough, but profuse expectoration, night-sweats, loss of appetite and repeated hæmoptysis.

February 10th. Tongue florid, moist; severe pain in epigastrium.

February 14th. Emaciation goes on rapidly.

February 20th. Pulse frequent and tremulous; tongue nearly natural: mind partially deranged; eyes bright, wild and staring. Coughs seldom, and expectorates little or nothing.

March 1st. Has not been observed to cough for a week past: other symptoms as before.

March 6th. No return of cough; pulse feeble; limbs cold and moist; eyes sunk in their sockets, with constant strabismus; facies hippocratica, and the most extreme emaciation I have ever witnessed.

March 7th. Died.

Autopsy by Dr. J. Pancoast, at my request.

Right lung slightly adherent; its upper lobe filled with tubercles, but no vomicæ: lower lobe but slightly diseased.

Left lung firmly adherent throughout, and solidified by tubercles and tubercular infiltration, with a very few softened tubercles. Bronchial mucous membrane slightly inflamed.

The *bronchial glands* and the *glands of the neck* prodigiously enlarged.

Heart natural. *Viscera of the abdomen* but little impaired.

Hæmoptysis for the most part occurs in the first stage of phthisis, is several times repeated at short intervals, and is accompanied by a depression both of mind and body, which the quantity of blood lost can in no degree account for.

Hæmoptysis is not necessarily followed by consumption,

although it is a very general precursor of that disease. Again, phthisis is not always attended by spitting of blood; for I cannot be certain that more than two-thirds of my cases have had this symptom. It is probable, however, that this proportion is too small; for I have occasionally met with a strange disposition in patients to conceal it, even after I have been assured of it by their friends.

It has been remarked by M. Andral, that of those who have had hæmoptysis, one fifth were free from tubercular disease; whilst of those who die of consumption, a sixth part never spit blood.*

The sources of hæmoptysis are four:

1. The bronchial mucous membrane.
2. The pulmonary tissue.
3. The rupture of a vessel.
4. The parietes of abscesses.

Let us examine each of these sources more in detail.

1. *Hæmoptysis from the bronchial mucous membrane. Bronchial hemorrhage.*—This follows violent efforts of coughing, of which it is mostly a mere mechanical consequence. The blood is usually in small quantity, frothy, streaking the saliva, and disappears with the subsidence of the cough. I grant the difficulty of identifying hæmoptysis from this source; but I have observed it to be unattended by those constitutional symptoms, hereafter to be mentioned, that usually occur with pulmonary hemorrhage. It may of course take place from any part of the mucous lining of the air-passages, and not unfrequently from the larynx itself. Again, this kind of hæmoptysis is not unfrequently similated by an oozing of blood from the pharynx and posterior nares.

* Clin. Med. t. ii. p. 39.

2. *Hæmoptysis from the pulmonary tissue. Pneumorrhagia.*—This morbid affection, says Laennec, is caused by an effusion of blood into the cellular tissue and air-cells. It is attended by heat and weight in the chest, cough, difficulty of breathing, languor, and a frequent, irregular pulse: the limbs are cold, or there are alternations of chill and heat. These symptoms, however, are often absent; and the patient suddenly expectorates a considerable quantity of blood with scarcely any other inconvenience. The blood is of a bright red colour, at first liquid and pure, but becoming frothy, discoloured, and mixed with saliva if the hemorrhage recurs, as it usually does, at short intervals.

This species of hæmoptysis is induced by violent efforts of mind or body, which, by producing at the same time an increase of the circulatory and a diminution of the respiratory function, give rise to a congestion of the pulmonary vessels. The congestion thus induced, is one of the most fruitful sources of consumption, of which the following will serve as an example:

Case 9. *Phthisis induced by a violent physical effort, causing profuse hæmoptysis.*—S. D., a black labourer, aged thirty-eight years, was admitted to the Philadelphia Alms-house hospital, January 3, 1833, with confirmed consumption. He is a tall, athletic man, with a remarkably broad, expanded chest, and other external appearances of a once robust frame. Says that about three years ago, in an effort to roll a bag of cotton without assistance, he was suddenly seized with profuse spitting of blood, followed by extreme languor and a chill, so as at once to disable him. He went home, and was under medical treatment for several days, the hemorrhage recurring at times, and attended by a feverish state. From that time to the present he has never been well, (though he assures me his health was perfect before the hæmoptysis), having habitual cough, sanguineous expectoration, hectic fever, night sweats, and paroxysmal pain in the left mammary region. Under all

these symptoms he labours at present. The upper half of the left lung yields a dull sound on percussion, and the stethoscope detects cavities beneath the apex. The pericardium seems to contain considerable fluid, causing violent palpitation.

This man's symptoms continued much the same until the 14th of February, when his pain had left him ; his tongue was natural, his appetite good, but the emaciation was more obvious, and the hæmoptysis frequent, but in small quantity.

March 9th. Diarrhœa last night, followed by great exhaustion. This symptom was readily checked, but recurred at short intervals until the 22d of March, when it became unmanageable and carried him off.

Autopsy, assisted by Drs. Betton, Simpson and Reeve, thirty hours after death. Great emaciation.

Right lung free; the superior lobe was full of tubercles, with a few interspersed vomicæ in the apex.

Left lung firmly adherent, contracted, and destitute of vesicular structure: on the contrary, it presented a series of funicular abscesses, extending from the apex to the base; the cords traversing these cavities were very numerous, mostly flattened, and towards the apex of the lung completely pervious, so that by means of a probe they could all be traced to the pulmonary artery: some of the larger branches were the diameter of a goose quill, their parietes much thickened, of an opaque yellow colour, with portions of adherent tubercular matter. The parietes of the abscesses consisted of dense, greenish-red structure, containing considerable fluid pus. The anatomical characters of this unusual case are accurately delineated in Pl. IV. fig. 2.

Heart greatly dilated, with a slight excess of serum in the pericardium.

Other organs not examined.

Remarks.—All circumstances considered, we may refer the origin of the preceding disease to pulmonary apoplexy, of which the hæmoptysis was a consequence and indication. With respect to the hemorrhage of the second stage of the disease, the denudation of the vessels might lead to a suspicion that it arose from a direct rupture of some one of them: but a most careful examination of the parts could detect no such appearance; and the tuberculous state of the right lung amply accounted for the continuance of this symptom.

Case 10. *Hæmoptysis from a violent physical exertion, followed by acute phthisis.*—B. D., a female cook, aged twenty-three years, with dark hair, light complexion and a strong frame, was admitted into the Alms-house hospital, July 10th, 1833 with confirmed phthisis. She informed me that while engaged in her vocation early in April last, and during great bodily exertion in a hot room, she was suddenly seized with profuse hæmoptysis. She assured me (and the family in which she lived confirm her statement), that up to the time of this occurrence, her health had been uniformly good, and even robust. Not aware of the serious nature of her disease, she concealed it for a week, during which time she frequently spit up more or less blood. She then called at my office, but not finding me at home, received advice from a respectable practitioner in the neighbourhood, was freely bled, and otherwise depleted. Not obtaining relief, but, on the contrary, growing worse every day, she entered the Alms-house with active hectic, purulent expectoration, night-sweats, dyspnœa, loss of appetite, and hæmoptysis, the latter recurring every day, and often profusely several times in the day. The stethoscope detected extensive abscesses in the upper half of the right lung. With these complicated and fatal symptoms she lingered thirteen days, and died on the 23d of July, without apparent suffering.

Autopsy, assisted by Dr. Allen, fifteen hours after death. Emaciation not remarkable.

Right lung firmly adherent at apex; on cutting into the lung it was found charged with light gray tubercles, the size of a pea, with interspersed smaller granules: the two upper lobes contained numerous vomicæ, the largest the size of an English walnut, and almost all of them with a firm cartilaginous cyst. The interstices between these vomicæ and tubercles in the superior lobe, were occupied by flabby pulmonary structure, of a dark livid or purple colour, in which the air-cells were apparently obliterated: it wanted the granular and solid structure of hepatization, and in fact bore no resemblance to any grade of pneumonia. The proximate surfaces of the pleura were of the same livid tint.

Left lung slightly adherent: the superior lobe contained two small vomicæ and vast numbers of tubercles, together with the livid appearance already noticed, but in less degree: lower lobe healthy.

Bronchial glands enlarged.

Bronchial membrane inflamed throughout.

Other organs not examined.

Remarks.—This was a case of *acute phthisis*, commencing with violence, and running through all its stages in a little

more than three months. The first symptom was hæmoptysis, which is proved to have occurred in the apices of the lungs by two circumstances revealed in the autopsy, viz. these parts being most affected by tubercles, and the parenchyma around the latter presenting the physical characters incident to engorgement or congestion: the disease having been short in its duration, the appearances in question were very conspicuous; had the disease been much prolonged, the livid parenchyma that remained would also have become tuberculous, and all traces of the original congestion destroyed.

3. *Hæmoptysis from the rupture of a vessel.*—This is an extremely rare occurrence; for it has been already shown, that in proportion as blood-vessels are denuded by ulceration, their parietes become thickened at the expense of their calibre. If hæmoptysis was a constant or even a common result of such denudation, it should increase with the progress of disease, and be most profuse in the second, or apostematous stage; whereas the very reverse takes place. Again, I have often observed extensive denudation of vessels in the lungs of those who never had been attacked by hæmoptysis.

Andral mentions an instance in which a vessel opened directly into an abscess; and Bayle gives the case of a patient who died of a frightful hemorrhage from a ruptured denuded artery, as was proved on examination after death. One of the crises of the following case, of an intelligent gentleman yet living, may, I think, be classed with this species of hæmoptysis.

Case 11. *Repeated hæmoptysis: once from a ruptured blood-vessel? Chronic phthisis.*—A young gentleman,* of robust frame, good general health, brown hair, fair complexion, and prominent eyes, whose habits were of an extremely studious and sedentary character, was

* The patient himself, at my instance, politely furnished me with the facts from which I have compiled this history.

attacked, in October 1821, *with a singular and indescribable sensation* in his chest, followed gradually by some pain, cough, emaciation, a pale, sickly countenance, and general debility. Notwithstanding these symptoms, they were concealed by the patient, who continued his professional studies as before, until May 1823, when he was seized by pain aggravated by respiration, accompanied by great oppression, or sense of weight in the lungs, at first paroxysmal, but in a few weeks becoming almost constant: the cough increased greatly, and was attended by dark and very offensive sputa. Towards the last of June hæmoptysis was added to the preceding symptoms; a mouthful of blood at first following several successive spells of coughing, and then flowing so fast that upwards of a pint was lost in about fifteen minutes: extreme exhaustion and dyspnœa followed; but the hemorrhage continued for two or three days to colour the fœtid purulent sputa, and then disappeared. But the very same symptoms recurred again in nine days, with even greater violence, causing a total prostration of strength, with a cold and livid skin, and all the appearances of approaching death. The treatment consisted in applying blisters to the breast, followed by tartar emetic ointment, and the internal use of infusion of wild cherry-tree bark: rubefacients were also freely used to the extremities. Strange to tell, the patient recovered slowly from these violent assaults of disease, and his cough, pain, dyspnœa, &c. all disappeared for about four years, leaving him in the enjoyment of pretty good health, though with an obviously broken constitution.

On the 30th of June, 1829, being in the city of New York, profuse hæmoptysis came on again without any known exciting cause; it recurred the two mornings afterwards successively, on each occasion about half a pint of blood being lost. He then left for Philadelphia, was again attacked with hemorrhage in Brunswick, but reached home in safety, though exhausted to an extreme degree by loss of blood. These attacks, as before, were preceded by a peculiar and indescribable sensation in the lungs, warning the patient of their approach. Cough and some pain followed the hæmoptysis, leaving him very liable to take cold on slight exposure; horseback exercise, a seton, and some minor remedial resources restored him to tolerable health.

In the month of April, 1830, his expectoration was for several days streaked with blood, but so slight that it was by him referred to the fauces; but finally, in the act of throwing off his coat, he felt what he has described to me as *a snap in the left lung, as sensibly as if a small cord had broken there.* Warned, by the sensation, of what had happened, he sat down and awaited the result, and in a few moments spit up about a gill of pure, florid blood. Although Dr. Noble, who was

immediately sent for, used all the usual plans to check the hemorrhage, it recurred three times during the two following days. But a naturally robust constitution triumphed over this, as over former attacks; and the subject of them, although much enfeebled, is now (September, 1833) able to resume his professional studies, which had for years been suspended by the inroads of disease.

A recent application of the stethoscope proves that his respiration is very imperfect in the infra-mammary region of the left side, but I cannot detect an abscess, although the symptoms at one period gave almost unquestionable evidence of the existence of such a lesion.

Remarks.—The long continuance of the preceding disease, its sudden and violent paroxysms, and the present comparative health of the patient, should at least inspire the practitioner with hope, and induce him to persevere to the last in every plan of treatment that promises even a palliation of disease.

4. *Hæmoptysis from the parietes of abscesses.*—I am not aware that this source of hæmoptysis has been noticed by pathologists; and although I have no doubt of the fact, it is probably of rare occurrence. The following case of profuse and protracted hemorrhage, furnishes the materials for this pathological view.

Case 12. *Hæmoptysis from the granulations of an abscess.*—H. S., a quarryman, aged thirty-six years, of a short, meagre person, sharp features, light complexion, dark hair, and intemperate habits, was admitted into the Philadelphia Alms-house hospital, November 6, 1832, with hæmoptysis. When I took charge of the wards, on the 5th February, 1833, he gave the following account of himself:—that he was seized with severe pain in his left breast in the autumn of 1831, followed by cough and spitting of blood; fever soon followed, with profuse purulent expectoration, which was almost constantly mixed with blood. Under these symptoms he now labours, together with extreme debility, and great emaciation.

February 14th. Cough and hæmoptysis almost constant, though but little blood is expectorated each time. Slight diarrhœa. Tongue clean.

February 20th. Diarrhœa checked, but the other symptoms continue as before, the night-sweats and hæmoptysis being very harassing.

March 2d. The sudden accession of cold weather, viz. from 55° of

Fahrenheit to 15°, has greatly reduced the patient; he has sanguineous diarrhœa, with severe pain in the rectum, and hæmoptysis as before. Pulse feeble. Countenance exsangueous. Stethoscope detects cavernous respiration in the apex of the left lung.

On the evening of same day he was seized with acute pain in the left axillary region, and thence shooting through all parts of the left side of the chest. Vomits all ingesta. Debility extreme.

March 6th. The cough and expectoration, after having been absent for nearly sixty hours, re-appeared this morning, attended by considerable hæmoptysis, and severe paroxysmal pain in the epigastrium.

March 15th. Colliquative diarrhœa.

March 20th. Diarrhœa checked: free expectoration of purulent matter and blood.

March 28th. Still complains of severe pain in the epigastrium, and vomits every thing he swallows. Facies hippocratica, and completely exsangueous.

The patient lingered until the 19th of April.

Autopsy, assisted by Drs. Simpson, Muhlenberg and Carson, five hours after death. Ultimate emaciation.

Right lung firmly adherent at its superior portions by old false membranes: several small abscesses in the superior lobe; respiratory structure tolerably well preserved in the middle and lower lobes, although even these contained numerous disseminated tubercles and some vomicæ.

Left lung adherent above by fibro-cartilaginous membranes. In the superior lobe was a circumscribed abscess the size of a hen's egg, lined by a firm, coriaceous membrane, half a line in diameter. The internal surface of this cyst was studded with patches of *red, vascular granulations, of an extremely delicate structure.* (Pl. V. fig. 2.) Beneath this abscess were numerous smaller ones, of the funicular kind, communicating freely almost to the base of the lung. The pulmonary structure around the cavities was replaced by gray induration, interspersed with tubercles and tubercular masses, in all stages of development.

The *bronchial mucous membrane* was unusually healthy, though it contained in one of its smaller tubes a ramose, osseous concretion.

Other organs not examined, in consequence of the presence of the brother of the deceased.

Remarks.—In the preceding case the bronchia were considered remarkably healthy by all the gentlemen present at the examination; and they also agreed with me in attributing the

probable source of the hæmoptysis to the granulations of the abscess; for these granulations were so delicate, so vascular, so numerous, that it seemed impossible they should not bleed during the patient's violent and often protracted efforts of coughing.

Clots of blood have been found in tuberculous cavities; and I have repeatedly seen the fluids of such cavities tinged with blood.

Pain.—This may be considered one of the most equivocal symptoms of phthisis. The great majority of patients declare that they suffer no pain in the chest, or at least so slight that it has not fixed their attention. In the first stage it is mostly in the vicinity of the lower bone of the sternum (præcordia), or between the shoulders: the latter is probably owing to inflammation of the pleura on the upper and posterior face of the lung; for we more frequently find adhesions in that vicinity than any where else.

In the second stage, as the abscesses form and the pleura becomes involved, inflammation of that membrane follows, occasionally causing acute pain over the whole of the affected side. Such is particularly the case, as already observed, when perforation takes place, though even this lesion may occur without pain. Pain in the epigastric region, and in various other parts of the abdominal cavity, are common, but I do not know that any of them possess a specific character.

It may be reasonably inferred that the lungs are among the most insensible organs: large abscesses form in them, and they become not only vastly disorganized, but even destroyed during the life of the patient, who, were he to judge merely from the pain he experiences, might suppose himself free from disease. (*Cases* 13, 17.)

I have met with two instances in which the patients com-

plained of intolerable pain in the legs;* in one of these cases there was extensive ulceration of the intestines; in the other the latter organs were not examined.

Expectoration.—In addition to what has already been said (*Contents of abscesses*), it may here be added, that the sputa in phthisis often afford an extremely fallacious diagnostic: for the fluids of the bronchia vary with the various diseases of those tubes, which moreover have the power of secreting genuine pus. Again, the purulent matter of pulmonary cavities is necessarily mingled with bronchial mucus; and although much ingenuity has been exerted to distinguish them unequivocally, the attempt has thus far proved fruitless.

M. Andral has justly observed, that pus and mucus often pass into each other by insensible shades, so that no precise distinctive characters can be drawn between them.

There can be no question that the dark, and even black streaks in the sputa of the second stage of phthisis, are derived from the black pigment of the lungs, which, being surrounded in the secretion of tubercular matter, Pl. II, fig. 3, is necessarily expectorated in the progress of disease.

Patients are sometimes suddenly carried off by the bursting of abscesses. An example of this kind occurred lately in a most estimable lady, who had been several years under my professional care. She at length began to decline rapidly, with all the fatal symptoms of confirmed phthisis. Early one morning, being summoned in great haste to see her, I found her calm, conscious and resigned, but nearly speechless, and in the agony of death, from the accumulation in the air-passages of fluids

* I may remark, in passing, that a gentleman whom I lately attended with a violent and fatal attack of enteritis, often assured me that the pain in his bowels was bearable compared to that in his feet and legs. An autopsy revealed extensive ulceration throughout the large intestine.

which she had not strength to expectorate. Her death, however, was perfectly tranquil. Her lungs were examined by Dr. Jackson and myself, when this sudden change in the patient was found to have proceeded from the bursting of a large abscess, which choked up the bronchia and caused suffocation. This abscess was in the superior lobe of the left lung: immediately above it was another, equally large, full of pus, and seemingly without any communication with the bronchia; so that had the patient succeeded in expectorating the contents of the first abscess, the inundation of the second would soon have followed, and destroyed life.

Hectic fever.—This mostly appears in diurnal paroxysms, commencing towards evening, and lasting the greater part of the night, when it goes off in colliquative perspiration.

The accession of hectic resembles that of intermittent fever, and, like the latter, it has three stages. The cold stage is accompanied by pains in the limbs, contracted features, partial lividness of the skin, and irritable stomach. Fever follows, with a circumscribed red spot in one or both cheeks, a dry, hot skin, thirst, dyspnœa, restlessness and languor, but without headache, or at most with very little. Then succeeds the colliquative perspiration, emphatically called a night-sweat; and hour after hour the patient is deluged with the cutaneous secretion, leaving him nervous and exhausted. These three stages of fever, each so different from the others, and each in turn racking the frame by contrasted violence, rapidly reduce the strength and undermine vitality.

It sometimes happens that patients have two such paroxysms in the twenty-four hours, one in the morning, another at night; while others appear to be almost constantly labouring with febrile irritation.

Other instances occur in which phthisis passes through all

its phases with scarcely any hectic symptoms; and I have repeatedly noticed, that where the fever has been severe and the diaphoresis in proportion, the latter has disappeared towards the termination of the disease, although the hectic continued unabated.

An obscure but certain indication of hectic, is almost invariably observed in a dry, burning sensation in the palms of the hands and soles of the feet, in some instances confined to the former, in others to the latter, and even extending to the elbow or the knee. I have met a solitary case in which this sensation was confined to the top of the right foot, recurring for several hours diurnally; the patient compared the sensation to that produced by pouring hot water on the skin.

Diarrhœa and vomiting.—In some rare cases diarrhœa commences very early in the disease, even among the initiatory symptoms, and recurring by paroxysms, terminates only with life. I have at this time a patient in my care who was attacked seven months ago with profuse diarrhœa, which lasted eight days, and was at length checked by opiates: it has recurred twice since, but by the timely interposition of medicine has been removed without difficulty. The neglect of this symptom involves fatal consequences.

In a majority of consumptives the immediate cause of death is diarrhœa; which, supervening on an exhausted constitution, terminates life in a very few days, sometimes in a few hours.

The usual cause of the colliquative diarrhœa of phthisis, is ulceration of the coats of the intestines, either in the lower part of the small intestine, in the colon (especially near its valve), or in the pouch of the rectum. In other instances this symptom arises from a disorganized and softened state of the mucous membrane, which is reduced to a consistence little firmer than mucilage.

In some instances, however, the diarrhœa which occurs for the first time in the last days of consumptives, appears to be owing simply to that complete inaction which the intestines suffer, in common with other organs towards the close of life.

Connected with the diarrhœa there is often an extremely irritable stomach, that rejects all ingesta excepting those of the simplest nature. Post mortem examinations show that this symptom results from inflammation of the mucous coat of the stomach; and in one instance, where the patient was much harassed by vomiting, I found a considerable ulcer near the pylorus. (*Case* 31.)

Dr. Wilson Philip has described what he calls a *species* of consumption by the name of *dyspeptic phthisis*, which he supposes to be induced by a diseased state of the digestive organs; but practical pathology has decided, that in a great majority of cases, the gastric is a mere consequence of the pulmonary affection.

Œdema.—The feet often swell in the latter stages of phthisis, but the effusion is mostly confined to the extremities, and disappears before death. I have rarely observed this complication to augment so much as to distress the patient. Ascites and hydrothorax are also infrequent, but I need scarcely repeat, that effusion into the pleura from perforation or from inflammation of that membrane, is of constant occurrence.

So much for the ordinary symptoms of consumption: I shall finish this part of my subject, with the history of a case in which all these symptoms were absent.

Case 13. *Absence of all the usual symptoms of phthisis: a large tuberculous abscess, and both lungs filled with tubercles; the latter also developed in most of the abdominal viscera.*—Monaco à Flores, a Spanish negro, aged twenty-seven years, of a tall but thin person, by

trade a tailor, was admitted into the Philadelphia Alms-house hospital, September 6, 1833. He stated that he was taken sick in the island of St. Thomas, West Indies, about a month previous, but that his indisposition consisted solely in debility: he declared that he had had no cough, difficult breathing, fever, pain or hæmoptysis, and uniformly gave the same reply to the questions which were repeatedly put to him on these points. On his entrance into the ward none of these symptoms could be detected; and although he lived three days after admission, he was not once heard to cough, or observed to expectorate. He breathed short, but without seeming pain; but he mostly sat with his legs bent under him, and his body leaning forward. His pulse was weak, frequent and tremulous; he had some appetite, but very little thirst. He lived until the 9th of September, and then died without apparent distress of any kind.

Autopsy by Drs. C. A. Porter and J. W. Paul. (An engagement prevented my personal attendance.)

Right lung crowded, from the apex to the base, with miliary tubercles, opaque but not softened: no vomicæ.

Left lung filled with tubercles in the same manner, but also contained, at the upper and posterior part of the superior lobe, an abscess the size of a hen's egg, which again communicated with several smaller ones.

No fluid in either pleura.

Bronchial glands much tumefied.

The *liver*, *spleen*, *kidneys* and *mesenteric glands* tuberculous, the latter organs being monstrously enlarged.

Peritoneum covered with tubercles with interspersed specks of melanotic matter.

Brain healthy.

Remarks.—The lungs (one of which I inspected subsequent to the autopsy,) were so completely charged with miliary tubercles, that I do not hesitate to say that not a quarter of a cubic inch of parenchyma, in any one place, was free from them. Can it be possible that all this disorganization was throughout unattended by fever, cough, expectoration or pain? Such was the patient's repeated asseveration; and during his short sojourn in the institution, every circumstance confirmed his statement. He appeared to live until the accumulation of tubercular matter prevented the oxygenation of the blood.

State of the mind.—In a great majority of instances, consumptive persons preserve an equanimity of mind, and an insensibility to danger, which have become a proverb: whence Dr. Good adds to his specific characters of phthisis—"delusive hope of recovery." This circumstance is chiefly to be attributed to the usual absence of bodily suffering, even while the disease is making frightful ravages: nor need we be surprised at the want of apprehension in those, who experience few or none of the ordinary manifestations of danger.

Yet this apathy often continues to the last moment of life, and the patient, with buoyant spirits, looks forward with pleasing anticipations of health and enjoyment, at the moment when the hand of death is already upon him. Providence draws a veil between man and his destiny. "Ignoratio futurorum malorum melius est quam scientia."*

An impressive instance of this kind lately occurred to me. A young man who had been under my care for some months with a most undisguised consumption, who had been exhausted by frightful hæmoptysis, and with all the usual symptoms, had a large abscess in one of his lungs, tottered into my house to ask further advice: but he prefaced his remarks by declaring his conviction that his lungs were perfectly sound, and that he only required a little more fortitude for the proper regulation of his diet, in order to attain a perfect restoration to health!

While the hectic paroxysm is acute, we often see the mind give way under the pressure of disease; but no sooner does the fever pass off, than the spirits resume their wonted elasticity.

I have occasionally met with instances in which a degree of mental derangement preceded the close of consumption. In a solitary example, that of a young man in whose fate I felt a more

* Cicero, *De Diis*, l. 2.

than ordinary interest, this mental alienation lasted nearly a week, during which time he scarcely ever recognized or regarded his nearest relatives; but about three days previous to dissolution his faculties were wholly restored, and remained unimpaired almost to the moment of his death.

I have already alluded to five cases of tubercular consumption in lunatics. Dr. Rush* mentions that he had observed two cases in which madness alternated with phthisis; the cough and expectoration being wholly suspended during the derangement of mind.

* Med. Inq. and Obs. vol. ii. p. 66.

CHAPTER VI.

ON THE COMPLICATIONS OF CONSUMPTION WITH OTHER DISEASES.

Fistula in Ano.—It has long been supposed that this affection has some connexion with the phthisical diathesis, and the remark has been so often made by observing practitioners as to deserve attention.* I have met with four cases, in three of which fistula supervened so directly on the pulmonary symptoms, and so kept pace with them, that I could scarcely consider its presence as an accidental coincidence.

Case 14. *Phthisis with fistula in ano; termination in hemorrhagic pleurisy.*—E. M., a mulatto shingle-dresser, aged forty, was admitted into the surgical ward of the Alms-house hospital, May 28, 1832, with fistula in ano, and a dry cough. After remaining for several months in the surgical ward, he was finally transferred to the medical ward with confirmed phthisis, a few days before my term of attendance expired. The man was of a meagre person, sharp face and narrow chest: he informed me that his cough followed soon after the fistula; that he had never had hæmoptysis, and very little pain in any part of the chest. The resident physician who had charge of this man when in the surgical ward, assured me that whenever the fistulous discharge diminished, whether from natural or artificial causes, the cough and other pulmonary symptoms were greatly aggravated, and *vice versa:* and that he had hectic fever and night-sweats, but both in moderate degree. He had eventually considerable pain in the chest, oppression and diarrhœa, and died rather suddenly, May 30, 1833.

* Baumes, *Sur la Phthisie*, t. i. p. 456.

Autopsy, assisted by Drs. C. A. Porter, Bacon, Peace and Thornton, twelve hours after death. Extreme emaciation.

Right lung adherent in patches; a large empty cavity in the apex; around the cavity the whole superior and more than half of the middle lobe were solidified by a vast aggregation of miliary tubercles, disposed in irregular masses, some of a light greenish colour, others of a clear red; the former contained small vomicæ; when examined by reflected light, the miliary tubercular structure of both masses was distinctly seen. (Pl. I. fig. 2.) The bronchia were rapidly disappearing, each remaining tube presenting a mere *cul de sac.*

Left lung firmly adherent by large patches of false membranes, formed of many laminæ, between which, over the upper and anterior part of the lung, was effused about half an ounce of dark, venous-looking blood. The upper lobe had a cavity the size of a hen's egg (being nearly twice the size of that of the opposite side), partially occupied by fluid pus and soft caseous matter. The remainder of the superior lobe was replaced by tubercular structure, precisely like that just described.

The lower lobe contained a few tubercles, and some osseous and calcareous concretions.

Bronchial mucous membrane inflamed and ulcerated throughout: and the *bronchial glands* were greatly enlarged, and charged with osseous masses the size of a small pea, together with larger calcareous nodules. (Pl. XII, fig. 2.)

Heart small and firm.

Liver nearly natural.

The external orifice of the fistula commenced an inch in advance of the anus, and extended nearly twice that distance into the perinæum: the heat of the weather prevented a more specific examination of it.

Remarks.—The blood effused between the false membranes in the preceding case, forms the *hemorrhagic pleurisy* of Laennec. In this modification of disease, it is rare to meet with so much coagulated blood, in place of which we commonly observe serum with more or less of the sanguineous colour. The laminæ of false membranes were evidently chronic; but the effusion of blood was owing to the supervention of acute pleurisy.

Of the three other instances of fistula in ano that have come under my care, I have preserved the following memoranda:

A fireman, of delicate frame and dark bilious complexion, during great exertions in working an engine, was seized with profuse hæmoptysis, which symptom was soon followed by all the others that characterize phthisis, including anal fistula: this increased with the progress of the disease, though the latter was not obviously influenced by the former. The patient died at the end of four months, but I could not obtain permission to examine his body.

A gentleman of a meagre person, and extremely dark and sallow complexion, was taken with chills and fever that resisted all tonic remedies; when he consulted me I suspected his paroxysms to be hectic, and was confirmed in the opinion by the sudden appearance of a fistula: his symptoms soon assumed every character of phthisis, and he died from home about six months after the accession of disease.

A young man of the sanguineous temperament, who pursued his medical studies with me in the year 1832, consulted me for a disease of the rectum, which proved to be fistula, and opened externally about an inch from the anus. He had cough, slight fever, pain, at times severe, in the middle sternal region, though the expectoration was inconsiderable. I applied an issue to his chest, with some internal remedies, and advised him to remove for a few months to the country. He did so, and seemed to be fast regaining his health; when suddenly, during an injudicious exertion of strength, a profuse hæmoptysis came on and reduced him extremely. He returned immediately to the city (April, 1833), with every symptom of confirmed phthisis; but the fistula had entirely disappeared three months before, nor had he, on his return, any remains of it. He chose, on his own responsibility, to sail for Europe (for in his desperate situation I could not advise such an alternative), and I have not since obtained any information respecting him.

Laennec mentions that he seldom met with this complication of phthisis, and where it did exist, he could not observe that it had any influence over the pulmonary affection. Andral has arrived at the same conclusion, he having met with but a solitary case among eight hundred patients.

Disposition of the bronchia.—In proportion as tubercular matter is secreted, and the air-cells destroyed, the bronchial tubes become useless, and are rapidly absorbed. (Pl. I. fig. 2.) In this way they all disappear, excepting a comparatively few trunks, which, communicating with the abscesses, become fistulous canals, for the conveyance of pus.* Such canals, however, do not retain their original healthy aspect; on the contrary, their cartilages are absorbed, and nothing remains but an altered mucous membrane.

Inflammation of the bronchia has been noticed in the preliminary chapters, together with its influence in the development of tubercles.

There is, however, a morbid state of the air-tubes, in which their canals become greatly enlarged; it is called *dilatation of the bronchia* by Laennec, who was the first to describe it. The following example, which is the most striking that has fallen under my notice, will serve to illustrate this singular disease.

Case 15. *Phthisis with dilatation of the bronchia, hepatization, and melanosis.*—T. C., aged thirty-nine years, dark hair, sallow complexion, sharp face, and meagre person, was received in the men's medical ward of the Alms-house, in March 1833, with erysipelas of the face, occasioned by a blister applied by himself to relieve pain in the head. The erysipelas was obstinate, and terminated in typhoid bronchitis, with erratic pain in the chest, and scanty but purulent expectoration: to the

"* Dans aucun cas nous n'avons rencontré de ramifications bronchiques á l'interieur des cavités tuberculeuses, où dans les masses de substance grise demi-transparente; en sorte que le premier effet du development de cette matiere paraît être, comme l'a remarqué M. Laennec, la destruction des bronches dans la partie où il a lieu."—Louis, *Rech.* p. 36.

last two symptoms he had long been subject. He lingered for about three weeks, and died the 6th of April. He had been for some months a pauper in the house, but not known to be phthisical.

Autopsy, assisted by Dr. Simpson, and Mr. Arrott, student of medicine, twenty hours after death.

Left lung. Adherent by slight false membranes. The superior lobe was tuberculous, partially hepatized, and contained an encysted concretion, intermediate between tuberculous and calcareous matter; around the cyst were also some tuberculoid granulations, and a considerable deposit of melanotic matter, arranged somewhat in a radiated form. It was also collected in an amorphous mass near the pleura, and disseminated in various parts of the adjacent disorganized tissue. (Pl. III. fig. 2.) The inferior lobe was a series of monstrously enlarged bronchia, connected by condensed pulmonary tissue. The membranous tubes were increased beyond the diameter of a crow-quill, and pressed upon the surrounding structure so as to destroy its elasticity, and gave it the hardness and colour of hepatized lung.* When these dilated bronchia were cut transversely, the lung had the appearance of a honey-comb.

Right lung. Strongly adherent: an abscess the size of a black-walnut near the apex, surrounded by tubercles and vomicæ. The inferior lobes were hepatized in patches, and tuberculous: the membranous bronchia slightly dilated.

The *mucous membrane of the cartilaginous bronchia* was throughout highly inflamed on both sides, and secreted puriform matter.

Heart and liver natural.

Stomach highly inflamed.

Remarks.—Laennec justly ascribes dilatation of the bronchia to chronic catarrh; in the preceding case, however, there are some collateral facts worth consideration. Of the several lesions, that of the bronchia was obviously the most chronic; and the tubercular disease was seemingly developed in proportion to the bronchial; may not the latter have excited the former? The pneumonia was merely in its second stage, and accidental; the bronchitis was acute, supervening on chronic. The patient may therefore be said to have died of typhoid pneumonia, with bronchitis.

* Laennec, L'Auscult. Med. t. i. p. 126.

The preceding case would rank with Bayle's third species, *phthisis with melanosis.*

Disposition of the pleura.—It is obvious that pleurisy may either precede or follow phthisis; in the latter case it results from the approximation of the abscesses to the pleura, which is at once involved in the inflammation. Hence the pleuritic affection is generally in proportion to the development of the cavities, and it is a rare circumstance to find the latter without the former. Thus, when the pleuritis is long continued and violent, the pleuræ are attached by false membranes of a fibro-cartilaginous firmness and great thickness. (*Case* 24.) (Pl. IX.) Yet the reverse occasionally happens, as is proved by the following example.

Case 16. *Enormous excavation with scarcely any adhesions.*—B. C., a labourer, aged thirty-five years; dark hair, sallow complexion, sharp features, and narrow chest, came under my care in the Philadelphia Alms-house hospital, February 1, 1833. Says he took cold in the month of December 1831, followed by hæmoptysis, almost constant pain in the upper sternal region, night-sweats and emaciation, under which symptoms he now labours.

February 10th. Night-sweats profuse, and slight diarrhœa.

February 14th. Pain all over the abdomen; diarrhœa increased; pulse frequent and tremulous; tongue with a yellowish brown fur. Applied the stethoscope for the first time, and found unequivocal cavernous respiration in the infra-clavian region of left side.

Symptoms continued to the increase until the 20th; his voice then became hoarse and sibilant, his countenance hippocratic, and his tongue clean. He died on the 22d.

Autopsy, assisted by Drs. Mason and C. A. Porter, thirty-one hours after death. Emaciation extreme.

Right lung. Numerous vomicæ in the upper lobe, and a cavity in the apex as large as a walnut. The inferior lobes were charged with disseminated tubercles, in all stages of development, some of them suppurating at the margin. (Pl. II. fig. 3.) A very few filamentous connexions between the pleuræ.

Left lung. Nearly the whole of the superior lobe was occupied by

an irregular encysted abscess, capable of holding half a pint of fluid, and half full of thin, inodorous, straw-coloured pus. The superior parietes of this cavity were formed by little else than the pleura itself. No adhesions existed in the vicinity, but there were a few filaments considerably lower down. The lung itself was tuberculous almost to its base.

Heart natural.

Other organs not examined.

Remarks.—This case is an exception to an almost invariable rule. "Point d'adherences," says M. Louis,* "point de grandes ni de moyennes excavations, le plus souvent même absence de toute espèce d'excavation: adhérences faibles et peu étendues, excavations ordinairement très petites, rarement d'une grande capacité; quelquefois absence d'excavation."

Another affection with which phthisis is sometimes complicated is *pneumothorax*, which may be complete or partial; the latter will mostly happen when the adhesions are numerous and firm. But if the serous effusion forming the origin of this disease be very protracted, there is reason to believe that the adhesions will disappear entirely, from the constant pressure and distension of the fluid. Thus we not unfrequently meet with cases in which the lung is greatly collapsed, leaving a considerable aeriform space between the two pleural surfaces, while the latter are still connected by filamentous adhesions that have become attenuated in proportion to the shrinking of the pulmonary mass.

Case 17. *Phthisis with pneumothorax, and complete collapse of the lung.*—M. C., a female of short stature and meagre person, dark hair, sallow skin, was received into the Philadelphia Alms-house hospital on the 8th of March, 1832. Has slight and not troublesome cough, hectic fever, anorexia, and muco-purulent expectoration in considerable quantity, but without effort or pain. Declares that she never has had pain in the chest, but complains of constant and excruciating pain in both

* Recherches sur la Phthisie, p. 40.

lumbar regions. Has been in this situation for several years, but without hæmoptysis, or much difficulty of breathing. Finally, from a sense of extreme exhaustion, together with the pain just mentioned, she could combat her symptoms no longer.

Percussion over every part of the left side of the thorax gave a sound so perfectly tympanitic as scarcely to leave a doubt of aeriform effusion in the pleura, which was confirmed by the stethoscope, for no trace of respiration could be heard. The right lung afforded both pectoriloquy and cavernous respiration at the apex. In this hopeless condition, and without any apparent aggravation or diminution of the symptoms, the patient died suddenly on the 29th of April, about six weeks after admission.

Autopsy, assisted by Drs. Mickle and Howell, twenty-four hours after death.

On making an incision into the left cavity of the thorax, there was an audible escape of inodorous gas. On pursuing the dissection, the lung was found reduced to half the size of a fist, and attached by its root to the posterior parietes of the thorax. There were no adhesions between the pleura, and no traces of perforate lung. The pleura costalis was of a dull whitish colour, opaque, dry and much thickened: what remained of the pleura pulmonalis had a dirty brown tint. On cutting into the lung itself, it presented a granular tuberculous mass, almost as firm as cartilage, of a grayish white colour, totally devoid of pulmonary tissue or bronchial tubes.

Left lung. Superior lobe with a considerable patulous abscess and some vomicæ beneath the apex; the inferior lobe alone presented respiratory structure, but even this was interspersed with miliary tubercles.

Abdominal viscera not appreciably impaired, excepting the *kidneys*, which were hypertrophied, flabby, and of a dark grumous colour, but free from tubercles.

Remarks.—I have no doubt that in the foregoing case the pneumothorax was owing to a series of lesions,—tuberculous abscess,—perforation of the pleura,—effusion,—collapse,—and gradual aeriform transmution of the fluid contained in the pleura. As the lung must in consequence have ceased its functions long before death, and had become permanently changed into an inert and semi-cartilaginous mass, the case is to be regarded as one of *spontaneous cure of phthisis*. For,

from the recent characters of the disease of the *left* lung, it is probable the latter had not existed (at least in the purulent state) more than three months; whereas the right lung must have been collapsed a much longer period.

Case 18. *Phthisis with pneumothorax, followed by acute pleurisy, and terminating by sanguineous cerebral apoplexy.*—T. E., a boatman, aged twenty-five years, light hair, florid complexion, and short well formed person, was brought to the Philadelphia Alms-house hospital on the 22d of March, 1833, under the following circumstances: took a violent cold two months ago (in the depth of winter), in consequence of exposure to the weather; a troublesome cough ensued, with fever, burning in the hands and feet, and night-perspiration. About a week ago was seized with violent pain beneath the left breast, which has increased every day since, and now constitutes *acute pleurisy*. The patient's face is red and livid by turns, the cough violent, the dyspnœa extreme, and the sitting posture the only one in which he can breathe. Bleeding from the arm and cupping over the seat of pain afforded considerable relief to his sufferings, but he died suddenly and unexpectedly, the evening of the day of his admission to the house.

Autopsy, assisted by Drs. Betton and Goddard.

Right lung adhered almost every where, and was tuberculous throughout: beneath the apex, and occupying most of the superior lobe, were several large communicating abscesses. No effusion.

Left lung. On opening the pleura it was found in a state of complete pneumothorax, the contained air compressing the lung to about one-fourth its natural size: from the proximate margins of the sulcus between the lobes, anteriorly, two funicular adhesions were given off, one from the superior, the other from the inferior lobe; these cords were upwards of an inch in length, flattened and nearly half an inch broad; they were composed of a delicate, transparent membrane (like that of the pleura), wholly filled with yellow adipose matter, and united at the pleura costalis. (Pl. XI. fig. 2.) These were the only adhesions; but the pleura, over a large space, was spread with the exudation of acute pleurisy. The lung itself contained immense numbers of tubercles in both lobes, but in the superior one they had opened into vomicæ: the parenchyma around them was compressed, dense, and seemingly hepatized, but on closer examination was seen to retain in some degree its vesicular structure. (Pl. IV. fig. 1.)

Bronchial mucous membrane violently inflamed.

Bronchial glands much tumefied.

Dr. Betton continued the examination, and found in the centre of the right hemisphere of the brain, about an ounce and a half of clotted blood, which had doubtless resulted from the violent efforts of coughing, and was the immediate cause of death by producing apoplexy.

Remarks.—Had not the adipose cords existed in the left cavity of the chest, it is altogether probable that complete collapse of the lung would have resulted, as in the preceding case; but even under such circumstances no advantage could have accrued from it, inasmuch as the right lung was already too much disorganized to serve the purposes of respiration.

Perforation of the pleura.—When ulceration reaches the pleura, if the latter adheres to the pleura costalis, a barrier is formed to the extension of the abscess in that direction. But if, as sometimes happens, the adhesions are wanting, or are of delicate consistence, the ulceration makes its way through the pleura. This process is often painful; for the acrid fluids of the proximate abscesses being thrown into the sac of the pleura, and the external air* at the same time admitted, sudden and violent inflammation comes on, sometimes constituting one of the most suffering episodes in this malady.

The phenomena attendant on this complication of phthisis are so well illustrated in the three following cases, that I shall give them in detail.

Case 19. *Phthisis, with perforation of the pleura, effusion, &c.*—R. L., a mulatto female, aged twenty-five years, was admitted into the Philadelphia Alms-house hospital, in November 1832.

When I took charge of the wards she informed me that her disease commenced, towards the close of the year 1831, with severe pain in the left side, followed in succession by cough, hæmoptysis, hectic and emaciation.

February 15th. Pain severe across the shoulders; night-sweats pro-

* Complicated pneumothorax.

fuse; pulse frequent and feeble. Tongue natural. Has lately been subject to vomiting after meals, which has now subsided. Appetite unimpaired. Stethoscope detects large cavities, with gurgling, in infra-clavian and superior mammary regions of left side.

February 26th. Sudden and severe erratic pain in the epigastric and left hypochondriac regions, extending at times over the whole left side of the chest: great dyspnœa; slight diarrhœa; pulse frequent and languid.

Lingered in this suffering condition until the 6th of March, when she died suddenly.

Autopsy, assisted by Drs. Mason, M'Neil, and C. A. Porter, twenty-nine hours after death.

Body much emaciated.

Left lung adhering by a few scattered, firm, white cords; pleura costalis slightly coated with albuminous exudation. Pleura pulmonalis of a greenish colour, shrivelled, and covered with rough albuminous exudation, of a honeycomb appearance: the pleura pulmonalis was coated with a smooth yellowish exudation: cavity of pleura contained about two quarts of turbid sero-purulent fluid, which on further examination was found to have escaped from the lung through two ulcerous perforations, one at the apex, the other lower down, but also in the superior lobe: the upper opening communicated with an insulated abscess, free from fluid, but coated in patches to a depth of two lines, with a yellowish, dry, caseous matter, that peeled off in flakes. The lower perforation opened into a series of large funicular abscesses, some of the cords being still tubercular, and all of them constituted of branches of the pulmonary artery. The lower lobe was collapsed and dense, filled with tubercles and vomicæ; in the midst of which was a mass that resembled washed fibrin, but was much firmer.

Right lung free, contained many tubercles and some vomicæ.

Heart, *stomach* and *uterus* not materially altered.

Remarks.—When the pleura has become perforated, several morbid conditions,—*pleuritis*, *effusion*, *exudation of lymph*, and *collapse of the lung*,—follow each other in rapid succession. The pleuritic inflammation, as before mentioned, is excited by the fluids of the abscess; almost simultaneously effusion takes place; and in proportion to the degree of it, the lung becomes collapsed and indurated by the mechanical pressure. The exudation, the first stage of false membranes, covers the pleura;

but, partaking of the inequalities of its pulmonary surface, and contracting with it, assumes the honeycomb appearance above described.

Case 20. *Perforation of the pleura, with inordinate effusion, and fibro-cartilaginous adhesions.*—J. J., a black female, aged twenty-eight years, came under my care in the Philadelphia Alms-house hospital, February 16, 1833. She was seized in December last with pain in left hypochondrium, followed by a troublesome cough. Has had no pain since, either there or in any part of the chest. Now labours under great dyspnœa, anorexia with occasional vomiting, night-sweats and profuse purulent expectoration. Tongue red and polished.

February 21st. Stethoscope yields no respiratory sounds in the upper half of the left lung; slight inflation of the inferior lobe. Patient keeps a sitting posture to aid respiration.

February 25th. Respiration obsolete throughout the left side, which I attribute to effused fluid, inasmuch as percussion is entirely dull over every part of it.

On the 28th of February this woman was pulseless, still sitting erect in bed, but without pain. On the following day her pulse returned, and she lingered with extremely short and oppressed breathing until the eleventh of March.

Autopsy, assisted by Drs. Mason and Bacon, thirty hours after death. Extreme emaciation.

On opening the thorax its *left* cavity was found to contain a gallon of offensive, turbid, sero-purulent fluid, caused by two large ulcerous openings in the pleura, which latter had the characters heretofore described. (*Case* 19.) The parenchyma of the lung had almost wholly disappeared, leaving a monstrous sac, which literally floated in the cavity of the pleura, and communicated with it in the manner just mentioned. What remained of the parenchyma was flabby and tuberculous. The pleura pulmonalis and pleura costalis adhered in front by a dense, opaque, yellowish-white substance, of a fibro-cartilaginous texture, half an inch thick; the rudiments of its further development were seen in numerous rounded granulations over all parts of the adjacent pleura. (Pl. XI. fig. 1.)

Right lung free, with a few unsoftened tubercles.

Heart dilated and flabby.

Other organs not examined.

Remarks.—The immense cavity which replaced the pulmonary tissue in this instance, led me to suspect the presence of gangrene; but there were none of the usual symptoms of gangrene during life, and the lung had not the fetid smell indicative of such a change. I am disposed to attribute the magnitude of the abscess, (which absolutely extended from the apex to the base of the lung,) to the supervention of pneumonic ulceration on the tubercular disease. I believe this complication to be much more common than is generally supposed, and I can recollect many cases in my former dissections in which I think it existed, though unsuspected at the time.

Case 21. *Perforation of the pleura, with copious effusion: encephaloid substance.*—A young man, aged twenty-three years, of short meagre person, sallow complexion, brown hair, and dissipated habits, came under my care in the month of April, 1833. He informed me that he took a violent cold about the middle of September 1832, resulting in pleurisy, which last disease, he says, has attacked him paroxysmally ever since. I found him with the following symptoms: violent cough, aggravated by the recumbent posture, profuse expectoration of purulent matter, obvious emaciation, good appetite, and great buoyancy of spirits. Has neither pain nor dyspnœa at present, though both harass him much at times: never had hæmoptysis. The stethoscope detected large cavities in his right lung.

Under these hopeless circumstances I applied a blister to his breast, and gave him a demulcent cough medicine. I saw him several times during the three days following my first visit, but he expired suddenly on the 16th of April.

Autopsy. Right lung. On opening the right cavity of the thorax, it was found to contain about a quart of inodorous, sero-purulent fluid, mixed with albuminous floculi; this effusion had escaped through a small perforation of the posterior face of the superior lobe. The entire pleura was either adherent by false membranes, or covered with albuminous exudation: the former, at the apex of the lung, were fibro-cartilaginous and nearly half an inch thick; the latter was in some places of almost equal depth, assuming, over the diaphragmatic pleura, a scarlet tint, and looking, at first sight, like muscular fibre. On incising the upper lobe, it proved to be infiltrated by tubercular matter, and contained

a series of large, communicating, funicular abscesses, into one of which projected a number of small, encephaloid masses, in a state of aggregation, yellowish-white, pulpy, and being collectively about half the size of an English walnut. The inferior lobes contained disseminated tubercles.

Left lung free; slight tubercular infiltration at the apex.

Bronchial membrane acutely inflamed, with prodigious mucous effusion.

Heart natural.

Other organs not examined.

Remarks.—The *encephaloid substance* met with in the above instance has also received the name of *medullary tumour*, or soft *cancer of the lungs*. Its appearance is much like that of the human brain, being soft, of a yellowish colour, and lobulated on the surface. Laennec has given a very accurate history of this substance, which he says passes, like tubercles, through three stages, until it finally becomes of the softness of paste. It constitutes the *cancerous phthisis* of Bayle; but as this is the only instance I have met with in a great number of dissections, I cannot but infer that it is of infrequent occurrence in our climate: in fact, M. Bayle observed it in but three instances among 900 autopsies.

Disposition of the blood-vessels.—A very few remarks remain to be added to those already offered. Although we frequently observe the perforate ramifications of blood-vessels crossing the cavities, it generally happens that they become suddenly obliterated in the proximate tubercular structure. In other instances they become imperforate at the very origin of the bands that constitute the more striking forms of funicular abscess, terminating there in a *cul de sac*, without leaving any trace of their former existence in the bands themselves. Yet it occasionally happens, that while many vascular ramifications have lost their functions, others, communicating with the same trunk, continue in partial activity, convey red

blood, and may even occasion hemorrhage. Soon after the circulatory function has become obsolete, however, the vessel is removed by the absorbents, until no vestige of it remains.

Case 22. *Remarkable denudation of a branch of the pulmonary artery.*—A. C., a mulatto female, aged thirty-one years, was admitted to the Philadelphia Alms-house hospital, January 20, 1833. Has had cough for a year past, and two attacks of hæmoptysis previous to admission, but none since. Has night-sweats, and subject to severe paroxysmal pain in the middle sternal region.

February 15th. Stethoscope detects cavities in the upper lobe of left lung, with distinct pectoriloquy. Percussion sonorous on same side, obviously derived from the abscess. Right side dull, but respiration pretty well preserved.

February 28th. Great dyspnœa and distress. Voice sibilant. The sudden accession of a cold north-east wind has greatly aggravated the patient's symptoms.

March 1st. Died.

Autopsy, assisted by Drs. Mickle, Porter and Peace, thirty hours after death. Great emaciation.

Left lung. The pleura adhered almost its whole extent; where free it contained serum. The lung itself was totally disorganized in the following manner: its inferior half was converted into dense tubercular matter in the crude state; its posterior or spinal aspect had suppurated into a large abscess, traversed longitudinally by a large blood-vessel, still pervious, though its caliber was greatly diminished. The trunk of this vessel, which I traced to the pulmonary artery, was denuded and wholly unattached for at least two inches of its course, sending off lateral branches, which, like its terminal ramifications, were abruptly lost in the surrounding tuberculous mass. The free portion of the vein was of a bright red colour, with fragments of adhering tubercular matter. The superior portion of this lung was a mixture of gray infiltration and pulpy parenchyma, with numerous vomicæ, and a patulous, funicular abscess in the apex. The central portion was in a state of incipient gangrene, of a mottled, dull, bluish colour. (Pl. VI.)

The *pleura* next the pericardium was about two lines thick, and of the appearance and consistence of cartilage.

Right lung free; its middle and superior lobe tuberculous, but no cavities.

Bronchial glands tumefied.
Heart natural.
Pericardium full of serum.
Liver, stomach and *bowels* not appreciably deranged.
Uterine cavity inflamed throughout.

Remark.—From the size of the lower abscess, and the more chronic characters of its lesions, compared with those above it, it is possible that the tuberculous disease commenced at the base of the lung.

CHAPTER VII.

CASES ILLUSTRATIVE OF OTHER COMPLICATIONS OF PHTHISIS, &c., WITH REMARKS.

I CAN conceive no better mode of further illustrating the protean forms of this disease, than by submitting the following series of cases, wherein I have been careful to preserve all the important facts that came to my knowledge. Every practitioner, however, has met with cases in which the symptoms were slight and almost neglected by the patient until within a short period of death, when his recollections of his disease had become vague and unsatisfactory: thus it has often happened, that I have obtained my facts almost independent of the patient's personal narration, and have preferred meagre truth to equivocal details. Some of these cases, again, have little other than an anatomical value, but each will serve to illustrate some one of the almost interminable complications of pulmonary consumption.

CASE 23. *Phthisis terminating in gangrene of the lungs.*—J. H., aged forty-six years, with black hair and dark sallow complexion, strong frame and well developed chest, was for several years an inmate of the lunatic cells of the Alms-house hospital. His mania was of the melancholic kind. On the 4th of May 1833, he was conveyed, in an emaciated state, to one of the medical wards: during the interval between his reception and death, which was about three days, he made no complaint, nor was he observed to cough or expectorate.

Autopsy, assisted by Dr. C. A. Porter, twenty-four hours after death.

The *right lung* presented the anatomical anomaly of having two lobes only, both of which adhered, both before and above, by old false membranes. Between the lower lobe and the diaphragmatic pleura, was extensive exudation of coagulable lymph, marking acute pleurisy. Beneath the apex were several small cavities, and the remainder of the lung contained scattered tubercles.

The *left lung* was divided into three lobes; the superior one was completely cavernous, the space between the abscesses being infiltrated by tubercular matter. The middle lobe was also cavernous, and the surrounding parenchyma gangrenous, of a brownish black colour, intensely fetid, and strongly contrasting with the crude tubercles that were disseminated through it. Inferior lobe sound. The adhesions of the pleura were old and firm, and the sac of the pleura contained considerable serum.

Heart natural.

Liver marbled with fat.

Other organs not examined.

Remark.—In this case there was no fetor of the breath before death, which is the usual symptom of gangrene.

Case 24. *Tuberculous abscess of the lung, communicating, by a fistulous canal, with an abscess on the back.*—On taking professional charge of the Alms-house hospital, on the 1st of February, 1833, I observed among other patients a man by the name of John Little, an Irishman, a weaver and schoolmaster, of a robust frame, finely expanded chest, blue eyes, fair complexion, and light red hair. This man gave me the following account of himself:

He was admitted into the institution on the 27th of December, 1832, with slight cough, severe pain between the shoulders, especially on the right side, accompanied by hæmoptysis: these symptoms commenced about a month previous to admission, the pain in the onset being extremely severe. Towards the end of January, the pain still continuing, he observed, for the first time, a swelling on the right side of his chest, between the base of the scapula and the spine, which has since continued to increase.

His symptoms now are (February 1st) occasional slight pain in the tumor, and through the upper right side of the chest, with active hectic, night-sweats, profuse purulent expectoration and occasional slight hæmoptysis, loss of appetite and great debility. Tongue slightly furred. The tumor occupies nearly the whole right interscapular region; viz. it ex-

tends from the top of the chest to the inferior angle of the scapula, and from the base of the latter to the spine, which it partially crosses to the left side. The tumor thus situated is extremely elastic, evidently occupied in a considerable degree with air, and tympanitic on percussion. The stethoscope, when applied to it, yields imperfect pectoriloquy, and the same result is obtained beneath the acromial end of the clavicle of the right side.

February 1st. I had the patient carried into the clinical lecture room, where I explained his symptoms to the class, and ventured the following diagnosis:

Tuberculous abscesses in the superior lobe of the right lung, and a fistulous sinus communicating between them and the abscess on the back.

February 3d. Distinct fluctuation in the tumor, at its lower part, when the patient is in the sitting posture: the upper portion being tympanitic. Expectoration profuse; cough severe.

February 5th. Prodigious purulent expectoration: very distinct cavernous respiration on the acromial side of the right infra-clavian region.

February 8th. As before, excepting some pain in the epigastric region, of which he has suffered paroxysms throughout his indisposition. Severe hectic, and exhausting colliquative perspiration.

February 10th. Tumor has sensibly enlarged, seems disposed to point on its upper half, and is extremely sensitive to the touch. Anorexia, and occasional vomiting. Pain in the left hypochondrium. Tongue dry and furred.

February 11th. Dr. Jackson, at my request, visited the patient with me, and entirely agreed with me in the pathology of the case.

February 14th. Expectorated more than half a pint of purulent matter at one time this morning. The patient's spirits, as usual, are good.

February 20th. Pain in epigastrium and left hypochondrium much increased. Expectoration profuse. Thinks that in certain positions of his body he can feel the fluids of his abscess flow into the air-passages.

February 24th. After a violent paroxysm of cough and excessive expectoration, the tumor remains almost wholly gaseous, tight, and of course tympanitic; by pressing it I induced cough.

February 28th. Tumor half filled with air and half with fluid: when percussion is applied, the sound and sensation are the same as when we shake a vial partly filled with water.

A cold easterly wind has produced a very unfavourable effect on this man, in common with all the consumptive patients in my care.

March 1st. Tumor somewhat enlarged, and encroaching on left side. General health declining. Pl. VIII. gives a faithful representation of the

patient at this period, drawn by my friend Dr. S. D. M'Neil, resident physician of the Alms-house.

March 7th. Last night felt a sudden sensation as of something giving way in the upper right side of the chest, but unattended with pain: immediately thereafter profuse expectoration ensued, so that a pint spittoon was filled in a few minutes. The matter expectorated had, and continues to have, a peculiar fetid odour, somewhat resembling assafœtida. Tumor larger than ever, and wholly gaseous. Stethoscopic signs as before.

March 12th. Expectoration still profuse, but much less offensive.

March 14th. Tumor full of fluid and tense; seems disposed to break near the centre, where it is supported by adhesive plaster.

March 16th. Dyspnœa, and a sense of weight in right infra-clavian region.

March 20th. Enormous purulent expectoration all last night, followed by aggravation of all the symptoms. Tumor entirely filled with fluid, and very sensitive.

March 23d. The apex of the tumor gave way this morning, and a pint of unmixed pus issued from it, possessing the odour of that expectorated on the 7th instant. In the afternoon the opening was enlarged with a lancet, when another pint of pus and some air escaped from the wound. No pain. Directed a poultice to the tumor; good diet, with wine and malt liquor.

March 24th. Delirious last night; on removing the poultice this morning, about half a pint of pus and considerable gas escaped from the abscess.

March 26th. Free discharge of pus from the back. Dyspnœa and great debility came on this morning. Patient complains of coldness in the tumor to a degree that gives him a general sensation of chillness.

March 28th. Seized suddenly last night with severe pain in the right mammary region, followed by great dyspnœa and exhaustion. No discharge from the tumor to day, and scarcely any cough or expectoration. Obviously dying. The dyspnœa and pain continued until near six o'clock in the evening, when he died, reserving to the last a degree of consciousness and resignation, not common in persons of his sphere of life: he even granted (with some restrictions) my request to examine his body after death.

Autopsy, in the presence of Drs. S. Jackson, W. B. Simpson, H. M. Tucker, and Reeve, and Mr. Arrott, student of medicine. Considerable emaciation.

On laying open the abscess on the back, its parietes were found to consist of a dense, lardaceous substance, of a uniform white colour, tinged

with yellow, dense but slightly elastic, and having much the appearance of the fat of pork in cold weather: this substance replaced all the original muscular structure over the abscess, towards the base of which it was more than an inch in thickness. The skin alone escaped this degeneration. At the bottom of the abscess were seen the spinous processes of four dorsal vertebræ, wholly denuded of muscular fibres, but preserving their interspinous ligaments; but both bones and ligaments were coated over with a firmer lardaceous matter, giving them the appearance and texture of cartilage to the depth of at least an eighth of an inch. Among the vertebræ, in the bottom of the abscess, lay a large mass of cellular membrane, of a chocolate-brown colour, but not evidently altered in texture. On removing this tissue, several fistulous orifices were seen, opening directly into the abscess, and between the vertebræ and proximate portions of the ribs: four of these orifices were large enough to admit a bougie, which passed in each instance into a tortuous canal.

The chest was now opened.

The *right lung* was partially collapsed, its pleura firmly attached, and in every stage of inflammation, the deposit of coagulable lymph being abundant and the adhesions almost inseparable: the cavity of the pleura was moreover filled with turbid sero-purulent fluid. The adhesions were cut through with much labour, and were found to consist of an extremely firm, whitish, fibro-cartilaginous substance, covering the posterior and superior portions of lung, and uniting the latter to the adjacent thoracic parietes, by a stratum more than half an inch in thickness: this cartilaginous mass embraced the ribs, occupying the intercostal spaces, and in fact formed, together with the bodies of the vertebræ, the floor of the abscess.

When the lung was removed, a single fistulous opening was seen perforating the adhesions, which opened into a canal leading towards the apex of the lung. The lung itself was now laid open by a longitudinal incision, when its apex was observed to contain an encysted abscess which looked, both as to appearance and size, like a transverse section of an English walnut: the cyst was about a line in thickness, fibro-cartilaginous, smooth externally where it joined the lung, but rough and corrugated within, of a light gray colour. In the posterior wall of the abscess was an opening, leading into a canal which perforated the cartilaginous adhesions in the manner already described; this canal had a membranous lining, and would readily admit a middling-sized catheter: after it perforated the cartilaginous adhesions between the first and second ribs, it branched into three or four tortuous ramifications, which terminated, as we have seen, in the bottom of the dorsal abscess, thus forming a free communication between the abscess in the lung and that on the back.

At the anterior and inferior side of the former was an orifice leading to another canal, which dipping down into the lung, terminated in the bronchia, at the root of the lung: this second canal was lined by a thin, corrugated membrane, doubtless the remains of a bronchial tube, and completed the communication between the abscesses and the trachea, thus corroborating the original diagnosis.

The whole superior lobe around the abscess was converted into dense induration, of a light gray colour, in some places presenting a slightly reticulated appearance, probably derived from obliterated air-cells: immediately below the abscess was an irregular oblong mass, of a white colour and elastic feel, crossing the lung transversely. The rest of the lobe contained disseminated tubercles, a few small vomicæ, and numerous tuberculoid granulations. The anatomical characters embraced in the above description are accurately delineated on Pl. IX.

The middle and inferior lobes of the right side were tuberculous, but without vomicæ, and capable of considerable respiratory function.

The *left lung* contained a few miliary and crude tubercles, and adhered slightly in several places, but was otherwise in good condition.

Heart natural; but the *pericardium* contained about half an ounce of serum.

Liver, *spleen* and *kidneys* natural.

The *bladder* contained a quantity of muco-purulent matter, resembling the secretions of gonorrhœa, which flowed through the urethra upon the table.

Remarks.—I confess myself at a loss to tell which of the preceding complications was the primary affection; nor have I been able to find, in books, any analogous case. There was no assignable cause for the attack, which was sudden, and destroyed the life of the patient in a little more than four months. That the inflammation of the pleura was inordinate, is proved by the surprising thickness and strength of the false membranes; and the complete induration of the upper lobe of the affected lung showed that it also had participated in the same inflammation. The great thickness of the cyst around the abscess would seem to indicate a chronic disease; and yet up to the time of the accession of pain, the patient had enjoyed perfect health, and was naturally of a robust constitution.

It has occurred to me that the inflammation may have commenced in the periosteum of the upper dorsal vertebræ, and involved all the proximate parts, bone, muscle, parenchyma, &c., in the manner we have seen. But if this were the fact, why should the abscess have made its way through the lungs in place of opening directly through the back? Perhaps the aponeuroses of the back prevented such an egress; and it is moreover not improbable that the abscess in the lungs had a prior existence to that of the vertebræ.

The *lardaceous degeneration* was the most surprising I have ever witnessed. This variety of morbid structure has been well described by M. Broussais: when incised it resembles the fat of pork; is hard, white or yellowish, of a uniform colour, and either exists in a mass, or is interposed between the laminæ of muscles. It seemingly involves almost all the tissues as in the preceding case; but the author just quoted, attributes the phenomenon, in every instance, to the influence of the cellular tissue, which, he informs us, undergoes the same transmutation. Such, however, does not appear to have been the fact in this case; for, as already mentioned, the cellular tissue of all the lardaceous parts lay in a mass in the bottom of the abscess, still firm, of a dark venous colour, and in surprising quantity. It was isolated, but not changed; while all the surrounding parts, bone (at least to a certain depth), tendon, muscular fibre, were reduced to the lardaceous substance; the latter, however, being nearly of a fibro-cartilaginous consistence where it occupied the place of the two first named tissues.

Case 25. *Phthisis complicated with diseased liver and jaundice.*—A. B., the mother of several children, aged forty years, of a very dark complexion, black hair and eyes, emaciated person, and of intemperate habits, was brought into the medical ward of the Alms-house hospital, April 29, 1833. She was slightly delirious, had a violent cough, com-

plained of pain in the right hypochondrium, and extreme weakness. Her stomach was very irritable, and her skin almost as yellow as saffron. It was obvious that both liver and lungs were involved in disease; but the only information I could elicit from the patient was—that she was taken ill, four months before, with pain in the side and cough, and had received professional advice. Her delirium and other symptoms were past alleviation, and she died in an extremely distressed state within forty-eight hours after admission to the house.

Autopsy, assisted by Drs. C. A. Porter, Muhlenberg and Allen, fourteen hours after death. Extreme emaciation, and livid yellow colour of the whole surface of the body.

Right lung. Old and firm adhesions at the apex: the diaphragmatic pleura, and the proximate costal pleura, (the seat of pain,) were covered with albuminous exudation. A large funicular abscess occupied the apex of the lung, beneath which the whole superior and middle lobes were occupied with tubercles and tuberculous infiltration, all of a uniform, deep, bilious-yellow colour: the colouring matter was not merely superficial, but penetrated to the centre of the tuberculous masses.

The *left lung* adhered to the apex, and in its upper lobe contained a large abscess, around which were observed precisely the same morbid appearances as on the opposite side.

Heart natural.

Liver much enlarged, indurated, and marbled throughout with adipose matter, the latter being of the same yellow tinge as the tubercles in the lungs.

Other abdominal organs nearly natural.

Remarks.—Dr. Wilson Philip supposes that one half the consumptions of Great Britain originate in hepatic derangements;* yet he adduces but slender evidence of his opinion; nor do I hesitate to say that in this country it is by no means corroborated. It is true that I have often observed functional derangement without being able to detect any organic lesion of the liver; but again, in a great number of cases, I have found that organ unimpaired.

In truth, every practical pathologist must have had occasion

* On Acute and Chronic Diseases, p. 326.

to notice that the liver is often greatly diseased without having given any prominent characters to the patient's symptoms; and again, there is often violent gastric irritation, with pain, nausea and vomiting, and other dyspeptic signs, without any evidence, from post mortem appearances, that the liver had any active part in the complication. I am satisfied that the hepatic affections are in most instances consecutive; for the adipose transformation (the most frequent of these affections) appears to be one of the derangements that follows, and is almost always dependent upon tubercular disease of the lung.

It has even occurred to me, that persons who have disease of the liver, are less liable than others to tubercular consumption; and that where the lungs are involved by hepatic disease, it is rather by the transmission of simple inflammatory action.

The adipose transformation of the liver is not unfrequent: in these cases the surface preserves its smoothness, but is mostly of a dull yellow colour speckled with red: within, it is either wholly or in part transmuted into a yellowish fatty substance, which in the early stage is irregularly mingled with the natural colour of the liver, giving it a marbled or mottled appearance. I have chiefly noticed this change in persons of intemperate habits.

Case 26. *Phthisis, with effusion in both pleuræ, and excessive tuberculous disorganization of the liver.*—R. M., a calico printer, born in Ireland, aged thirty-six years, with brown hair and light complexion, was received into the clinical, from the surgical, ward of the Alms-house hospital, February 22, 1833. He was originally admitted with a sore leg, which he has suffered much with for three years past: he has also a syphilitic bubo.

Has had cough for four months, and repeated hæmoptysis; the latter has not recurred for a month past, but the catarrhal symptoms are violent, the purulent expectoration profuse, and the hectic exhausting. The

stethoscope immediately detected an abscess in the left lung, with ægophony, but so violent was the cough and so extreme the distress of the patient, that the right side could not be examined.

February 24th. Voice sibilant. Slight cavernous respiration in right lung. Declares that he never has had pain in any part of his chest.

February 28th. Dyspnœa and great restlessness. Appears to be dying.

March 2d. Rallied so much as to sit up in bed, and converse without difficulty.

March 4th. Sudden and violent accession of all the preceding symptoms. Death.

Autopsy, assisted by Drs. Mason, C. A. Porter, M'Neil and Mickle, thirty hours after death. Great emaciation.

Thorax. On opening the right side of the thorax, about two quarts of turbid serum were contained in it; the fluid had compressed the lung to one third of its natural size: the pleura was free, except a small part in front, and over the lung was rough and cellular like a honeycomb, being in some places of a greenish-yellow colour, and putrid aspect, but without fetor. The upper and middle lobes were moderately disseminated with tubercles, among which were a few small vomicæ.

The *left lung* adhered at the apex, and the pleura contained a quart of serum: within were several large communicating abscesses. All the remaining portions of the lung were charged with tuberculous infiltration and miliary tubercles.

Bronchial glands enlarged.

Mucous membrane highly inflamed.

The *liver* was in a state of hypertrophy, and presented a vast congeries of dense, yellow, spheroidal tubercles, from the size of a cherry-stone to half an inch in diameter. They projected over the whole surface of the viscus, giving it a knobbed or noded appearance.

Spleen about five times the natural size, with a few scattered tubercles.

Kidneys natural.

The *stomach* and *intestines* presented nothing remarkable.

Case 27. *Excessive tubercular disease of the lungs, without the ordinary symptoms; cicatrization of a small abscess.*—M. W., a thin, sallow, gray-headed man, aged sixty-two years, of intemperate habits, was admitted into the medical ward of the Alms-house hospital, April 6, 1833. He complained of slight pain in the back, and extreme debility; he had no obvious hectic, no nocturnal perspiration, no cough, and while

in the ward was not observed to expectorate. He had long been a pauper in the out-wards, but had never before, to my knowledge, been in the medical department of the institution. His constitution was worn out by spirituous potations, and he died in forty-eight hours after admission.

Autopsy, assisted by Drs. Simpson and Betton, thirty-four hours after death. Great emaciation.

Right lung firmly adherent by old membranes; the lung itself had shrunk, drawing in the ribs so as to occasion an obvious distortion of the thorax. The superior lobe contained a number of small abscesses, and the whole remaining portion of the lung was so full of tubercles and vomicæ, as to be totally incapable of the respiratory function.

Left lung non-adherent; but so replete with tubercles that not half a cubic inch, in any place, was free from them. A few small vomicæ were interspersed among them. The anterior surface of the pleura of the inferior lobe presented a bluish-white spot, less than half an inch in diameter, around which the pleura was puckered, and of a preternatural dark colour: continuous with this spot was an irregular prolongation for about an inch and a half, also immediately beneath the pleura. On cutting into the lung, these appearances were proved to result from the remains of a vomica the size of a filbert, and a fistulous canal leading from it, both of which had become filled up with a cartilaginous substance, of a granulated texture and dark green colour: in other words, here was an abscess, with its fistulous canal, both of which had become perfectly cicatrized. (Pl. XII. fig. 1.)

The *bronchial mucous membane* was inflamed, and the *bronchial glands* much enlarged.

Heart and *liver* natural.

Other organs not examined.

Remarks.—Experimental physiology has proved, that a pair of healthy lungs will contain about 150 cubic inches of air, and that upwards of thirty cubic inches are changed at a single act of respiration. In the preceding case how small a degree of this vital function remained active! for probably not more than a twelfth part of the whole pulmonary apparatus was capable of respiration. A modern author has asserted that if a twentieth part of the lungs remains sound, it is sufficient for the mere continuation of life.

I reserve some remarks on the cicatrization of abscesses for the next case.

Case 28. *Complete cicatrization of several tuberculous abscesses.*—A lady, aged thirty-two years, of strong constitution and good frame, but of a nervous temperament, with dark hair and brunette complexion, had been for some time under the care of Dr. Hodge for an attack of severe nervous irritation, when, in the absence of that gentleman, I was requested to see her on the 6th of May, 1833. On my arrival I found her dying, and she survived but a few hours.

Autopsy, by Dr. Hodge and myself. There was no obvious emaciation.

The *ventricles of the brain* were nearly full of serum, but the organ itself was healthy, and no trace of tubercles was observed. The membranes, especially the pia mater, were highly inflamed and injected, the latter being charged with serosity, and having on its surface two or three small patches of inflammatory exudation.

The *thorax* was contracted in its antero-posterior diameter; and on removing the pectoral muscles, the five or six superior ribs were observed to be considerably depressed at their sternal extremities, where their cartilages joined them at a remarkable angle which protruded into the thorax. *The left lung* adhered at its apex, at which point the pleura was deeply contracted or puckered: within was observed a rounded white mass, about an inch in diameter, composed of granules of a cartilaginous firmness; this was obviously a cicatrized abscess; and in its centre were two or three crude tubercles. The remainder of the lung was perfectly healthy. The *right lung*, like the left, adhered at the apex, where the pleura was also deeply sunk and puckered: beneath one of these plications was the remains of an old, but very small abscess, half filled with granular matter like that in the other lung, excepting that it was of a darker colour; the remainder of the abscess was in a suppurative state, and contained yellow pus. Close by were the evidences of a second cavity, the size of a filbert, but perfectly filled and consolidated by white granular matter, precisely like that in the left lung. The remainder of the parenchyma was healthy, excepting only a small calcareous concretion towards the base of the lung.

The *liver*, *spleen*, *stomach*, *intestines* and other organs were examined, and appeared to be unimpaired.

Remarks.—The unexpected morbid appearances of the lungs induced me to inquire into the previous history of the patient;

when I was informed by a near relative, that in early life she habituated herself to excessive tight lacing; but although she had never experienced any obvious ill effects from this practice, she had of latter years discontinued it, from a conviction of its injurious tendency.

It seems probable, therefore, all circumstances considered, that the lungs became tuberculous and cavernous from the irritation of mechanical pressure; but on the latter being removed, the morbid secretion ceased, and the cavities became cicatrized and obliterated in the manner just mentioned. Can there be a doubt, that if this lady had persisted in the unnatural confinement of her respiratory organs, the tuberculous disease would have extended, the abscesses enlarged, and the disease become a fatal malady? The predisposition to phthisis being slight, it was suspended by the removal of the exciting mechanical cause; showing what important results physical education may produce on the human frame.*

Laennec seemed disposed to anticipate the cicatrization of abscesses in a much larger proportion of cases than experience is likely to realize. Besides, as in *Case* 27, one abscess with its fistulous canal may undergo this process, at the same time that innumerable tubercles and numbers of abscesses remain in a state of active irritation: so that the cicatrization removes but a thousandth part of the disease, and affords no sensible relief to the patient.

"It may in general terms be assumed," says M. Laennec, "that when the sputa are yellow and opaque, the emaciation considerable, the hectic intense, these symptoms are less unfavourable when conjoined with manifest pectoriloquy, than

* "Very straight lacing and straining for a fine shape, hath made many a fine girl spit blood, and ruined the lungs by preventing a full and free respiration."—Reid, *On Consumption*, p. 199.

when they exist without the latter phenomenon; because, in the first instance, the symptoms may be attributed to the efforts of nature in softening and removing the tuberculous mass, and we may indulge the hope that they will cease when this process is completed, provided the remaining portions of the lung be in a healthy state. Whereas, in the second case, we may suppose the existence of a great number of tubercles, which will exhaust the patient before they can become softened and form ulcerated cavities."*

But the complete uncertainty of an accurate diagnosis in such cases must be obvious to every one; and although I have been able to record a solitary example of almost perfect cicatrization, and consequent spontaneous cure of what may be called a case of accidental phthisis, the instances are so rare that they must be regarded as extraordinary exceptions to a general law of nature.

Case 29. *Phthisis of one lung, complicated with acute and chronic peritonitis.*—P. M., a French cartman, aged thirty-two years, sharp features, emaciated person, black hair and sallow complexion, was admitted into the Alms-house hospital on the 6th of April, 1833.

Complains of great pain and soreness over the whole abdomen, which he says first attacked him, together with active fever, thirteen days since. His abdomen is now tense, extremely sensitive to the touch, and full of fluid, which last he declares did not appear until the past week; and that previous to the present attack he was, so far as he knew, in good health, being able to pursue his avocation without intermission, having never been troubled with cough, pain in the chest, short breath, or any other indication of diseased lungs. I was induced to inquire particularly on these points, because his aspect was that of a man whose lungs were affected. His extremely exhausted state induced me to forego the application of the stethoscope, and he lived but forty-eight hours after admission.

Autopsy, assisted by Dr. Simpson, twenty-four hours after death.

* L'Ausc. Med. t. i. p. 128.

Emaciation extreme: skin of a yellowish sallow hue: abdomen tumefied, but no œdema of the extremities.

Right lung sound in its parenchyma, not having a solitary tubercle in any part: its pleura, however, adhered firmly in several places; and where free, was studded with diaphanous miliary granulations, which on the diaphragmatic pleura were of a yellowish colour, and looked like tubercles.

Left lung. Apex free, and superior lobe sound almost throughout; but at its lower margin the tubercular degeneration commenced, the parenchyma being literally solid with large tubercles, aggregated, and in every stage of development. Around the tubercles the lung was of a dark red colour, and dense, like hepatization, excepting that it wanted the distinct granular structure. The base of the lung was attached to the diaphragmatic pleura by dense fibro-cartilaginous adhesions, not less, in some places, than three-fourths of an inch in thickness. The diaphragm itself, though retaining its muscular fibre, was completely covered on both its surfaces by layers of the same dense substance, as was obvious on opening the

Abdomen. The entire surface of peritoneum, both its abdominal and visceral surfaces, was thickly studded with diaphanous, gray, miliary granulations, mostly the size of a millet-seed: the liver, spleen, stomach, &c., were all covered in the same manner, but none of these organs were tuberculous within, or enlarged, or sensibly disorganized: over all the granulations on the umbilical and anterior hypogastric portions of peritoneum, there was a free exudation of lymph, marking an extensive acute inflammation. The abdominal cavity contained two quarts of turbid serum.

Case 30. *Tubercular disease of nearly all the viscera: gangrene of the lung.*—B. B., a black labourer, aged fifty years, of an athletic frame, was admitted to the Alms-house hospital, August 26, 1833. Says he was attacked four months ago with violent pain in the chest, aggravated by a constant cough, followed soon after by spitting of blood. Had the cholera a year ago, and has never been quite well since.

Has now active hectic, colliquative perspiration, and pains in the limbs, but none in the chest.

The stethoscope indicates a collection of fluid in the left pleura, which seems to communicate with a cavity in the lungs: vesicular respiration obsolete throughout.

Right lung tuberculous.

August 28th. Pulse weak and tremulous; but no pain, or even distress in any part of the body.

September 1st. Extreme exhaustion and rapid emaciation.

September 4th. So weak as to be unable to change his position, yet has no dyspnœa, pain, or even restlessness. Complains of debility only. Breath extremely fetid. No diarrhœa.

September 5th. Died.

Autopsy, assisted by Drs. C. A. Porter, Paul and Thornton, eighteen hours after death. Extreme emaciation.

Thorax. Right lung free, but the the pleura was thickened, and spotted almost over its whole surface with melanotic matter, which seemed, however, to be rather in the subjacent cellular tissue: the lung itself contained disseminated spots of the same substance, and great numbers of small, tuberculoid granulations, which in one place had coalesced and partially softened.

Left lung. The pleura adhered throughout, and formed the exterior parietes of an immense abscess, which having almost destroyed the lung, extended its ravages between the lung and its pleura, separating the two almost to the base of the lung; in this manner a cavity was formed capable of holding a quart, and partially filled with a dark-coloured, fetid pus. What remained of the parenchyma was filled with tubercles, and gangrenous in its upper half.

Bronchial glands enlarged and tuberculous.

Bronchial mucous membrane inflamed.

Heart natural.

Liver fatty, with many small tubercles.

Spleen enlarged, firmer than natural, and full of tubercles.

Kidnies enlarged; structure distinct and pale, with a few tubercles.

Stomach inflamed, and its cellular coat so emphysematous as to resemble, at first sight, an extensive white tumor, projecting internally.

Mesenteric glands enlarged and tuberculous.

Brain healthy.

Remarks.—The preceding case presents a remarkably tuberculous diathesis. It is the first instance in which I have detected tubercles in the kidney,—an unusual occurrence, of which Louis records but three examples. I have, however, often noticed a preternatural redness of these organs, connected with an obvious hypertrophy, and a very distinct

arrangement of the cones constituting their medullary portions.

Case 31. *Phthisis, with extensive ulceration of the mucous membrane of the bronchia, trachea and larynx.*—Owen Twin, an Irish labourer, aged twenty-four years, with reddish brown hair, florid complexion, blue eyes, and a well-formed chest, was admitted into the Alms-house hospital, August 24, 1833.

Says he was perfectly well, and had always enjoyed good health until the ninth of the present month, when he was taken with a violent cold, accompanied with a bad cough, and general debility, all which have increased daily ever since.

Has now a constant cough, some hoarseness, fever, colliquative perspiration, sick stomach, and slight diarrhœa. Has never had hæmoptysis. The stethoscope detects a large cavity in the apex of the left lung.

August 26th. Considerable dyspnœa, which was relieved by free cupping. No pain.

August 29th. Hectic severe; but the diarrhœa has not returned.

September 5th. Dyspnœa and severe cough, which were relieved by cupping. Expectoration profuse and prevalent; tongue dry, with a slight brown fur.

September 8th. Delirium last night. Return of dyspnœa, and complains of extreme oppression at the chest.

September 11th. Died.

Autopsy, assisted by Drs. C. A. Porter, Paul, Bacon, Peace and Thornton. Emaciation moderate.

Right lung free, but contained a great number of yellow, opaque, irregular tubercles, but no abscesses, excepting two or three about the size of a filbert in the superior lobe.

Left lung slightly adherent, completely tuberculous, with a large, delicately encysted abscess in the apex, communicating with several others beneath.

Bronchial glands enlarged, yellow, and of a caseous consistence.

Bronchial membrane excessively inflamed and deeply ulcerated near the bifurcation. Membrane of the *trachea* and *larynx* also violently inflamed, and covered with numerous large, deep ulcers, which on the anterior portion of the trachea had destroyed the cartilages for an inch in length. In the larynx the mucous membrane was almost destroyed, being reduced to a thin, soft consistence, of a pale yellow colour.

Heart natural.

Stomach, mucous coat softened, and an ulcer the size of a finger-nail near the pylorus.

Intestines. Mucous membrane softened, but not ulcerated.

Mesenteric glands greatly enlarged and caseous.

Liver almost wholly transformed into a fatty substance of a yellowish colour.

Spleen tuberculous.

Kidnies sound.

Remarks.—When this man first came under my notice, I thought his case might be one of acute phthisis, although I could scarcely believe in the formation of a tubercular abscess in the short period of fifteen days: the autopsy, however, explained all; for it is certain that the encysted abscess had existed in his lung long before it gave him any uneasiness; and what he supposed to be the onset of disease on the 9th of August, was in fact the supervention of inflammation in the mucous membranes of the air-passages, from the irritation of such a vast congeries of tubercles. This inflammation had passed rapidly to ulceration, in some places destroying even the tracheal cartilages; and yet it is surprising that the patient never once complained of any pain or uneasiness, that could have led to the suspicion of such a complication!

This case combines both the tracheal and laryngeal phthisis of the nosologists, the ulceration of the trachea, however, greatly predominating. Authors tell us how to distinguish these two affections from each other; they say that the pain of tracheal phthisis is lower down than when the larynx is affected, and that in the former disease the voice is not altered. In the example before us the patient never complained of pain in the air-passages, and although the larynx was manifestly involved to a considerable degree in the ulceration, the voice was not more affected by hoarseness than is common in ordinary catarrh.

That both laryngeal and tracheal ulceration are commonly consequent to a tuberculous condition of the lungs, there can be no question: such was the fact in the preceding case; but it has been well ascertained that tracheal phthisis may exist as an independent disease, and cause death without organic affection of the lungs.

Broussais has given the name of *pneumonic phthisis* to that variety which most resembles pure sanguine inflammation of the lungs. He describes it as preceded by catarrh, and subsequently assuming the characters of pneumonia. The following case, though unconnected with tubercles, may serve as an illustration; but it is, strictly speaking, a true *apostematous consumption*,* of the older pathologists, and the *ulcerous phthisis* of Bayle.

Case 32. *Chronic pleuro-pneumonia, terminating in abscess of the lung and gangrene, without tubercles.*—W. B., a black boy, aged fourteen years, of an emaciated person, long thin visage, chest flattened above, narrow and projecting at the scrobiculus cordis, eyes prominent, sclerotica yellow, was admitted into the Alms-house hospital, on the 3d of July, 1833. Not being in attendance on the institution, I did not see him until the 6th.

He informed me that he was for several hours exposed to wet and cold about five months ago, in the depth of winter: was soon afterwards seized with violent pain in the right side, constant cough and fever. Under these circumstances he received very little attention. Has long laboured under hectic fever, profuse night-sweats, burning dryness of hands and feet, and some pain in both mammary regions; cough constant, and expectoration considerable; but has never spit blood.

He has all these symptoms at present, together with great restlessness, dyspnœa, and slight diarrhœa. I attempted to apply the stethoscope, but his constant jacitation precluded its use. He died the same evening.

Autopsy, assisted by Drs. Bacon, Postell, Allen, Peace and Thornton, seventeen hours after death. Considerable emaciation.

* Duncan, *On Consumption*, p. 14.—Phthisis a vomica, Cullen, *Syn. Nosol. Meth.*

Right lung. Very firm, and general adhesions between the pleuræ, especially around the middle lobe, where was a large circumscribed cavity, formed between the lung and pleura costalis, and partly filled with frothy, muco-purulent fluid. On removing the lung (which was effected with difficulty on account of the extreme firmness of the adhesions), it was found to contain, in its middle lobe, numerous small abscesses the size of a filbert, partially divided by septa composed of blood-vessels and condensed pulmonary substance, and communicating freely with each other, with the abscess of the pleura, and with the bronchia. The blood-vessels were about the size of a crow's quill, and completely denuded; in fact, the cavity had all the characters of funicular tuberculous abscess: but not a trace of tubercular matter, not even a miliary granule, was any where to be found; the lung was hepatized and flabby, except at the apex, which presented considerable sound respiratory structure. Gangrene had commenced in the parts adjacent to the abscess, giving them a greenish-brown colour, and exhaling an intensely fetid odour.

Left lung slightly adherent; pulmonary tissue unimpaired.

Bronchial membrane highly inflamed; and bronchial tubes filled with muco-purulent fluid.

Heart dilated, flabby, with a small spot of organized false membrane on its body.

Liver natural.

I wished much to have examined the lymphatic system, but was prevented by the intolerable fetor and extreme heat of the weather.

Remarks.—Here were all the constant symptoms of phthisis pulmonalis; here was abscess and denudation of vessels, without a trace of tubercular disease, although the pneumonic irritation had lasted five months, and this, too, in a negro. Must we not attribute this fact to the total absence of the tubercular diathesis? The presence of gangrene was perfectly well marked; and some pathologists may attribute the cavities in the lung to the separation of eschars; but as the sphacelus occurred in the centre of a chronic pneumonia, it is but reasonable to regard it as one of the terminations of the latter.

When gangrene commences in the lung, it may usually be detected during life by the unsupportably fetid breath of the

patient: in the present instance this pathognomic sign was absent, nor was there any reason to suspect the gangrenous change.

It was until within a few years a common opinion that pneumonia often terminates in abscess; but it is now, by almost universal consent, admitted to be an extremely rare occurrence. "During the three years" says Broussais, "that I have been engaged in this vast theatre [the army hospitals], I have examined the bodies of all those who died of phthisis in my charge; of these but one had ulcerated lungs without tubercles, and this was caused by the presence of a foreign body."

I confess myself surprised at the very opposite conclusions drawn by Sir Alexander Crichton* from an extensive experience in pneumonia; for he asserts that in *every case* where he inspected the lungs of persons who had died in the purulent stage of pneumonia, he found an ulcerated cavity containing pus. Whether this discrepancy is owing to variations of the disease dependant on climate, I will not attempt to decide; but I am confident that the experience of Laennec, Broussais, and many others, is equally applicable to the pneumonia of this country.

Case 33. *Pneumonic abscess in the lung, communicating with an abscess of the liver, without tubercles.*—J. Wheeler, a negro, aged thirty years, with a deep but narrow chest, was admitted into the Alms-house hospital in May, 1833, but not being in attendance on the institution at that time, I did not see him until the 1st of June, when he gave the following account of himself: that during a voyage in an open boat down the Magdalena river in South America, in the month of August, 1832, and while the boat was going with great velocity, his right breast came in contact with the projecting branch of a tree; he was knocked down and stunned by the blow: on reviving, he suffered extreme pain beneath the injured part, extending from the right hypochondrium to the top of the shoulder; which pain has continued with little intermission ever since.

* Practical Observations on Pulmonary Consumption, p. 155.

He has now severe pain, increased by a full breath, purulent expectoration, but no night-perspiration or hæmoptysis. Pulse slightly accelerated: tongue a little furred. Complains of debility.

June 15th. The stethoscope shows that there is scarcely any respiration in the anterior and lateral portions of the mammary and inframammary regions of the right side. Left lung not obviously impaired.

July 1st. Increased debility and purulent expectoration: the cough, however, is not distressing, and the pain is diminished.

July 15th. Copious purulent expectoration, streaked with blood.

July 20th. The sputa are now constantly mixed with blood, and the cough is aggravated.

August 1st. Purulent expectoration and hæmoptysis profuse. Hectic active.

August 15th. No other change than increased debility. Stethoscope again used, but detects no lesion except at the spot noticed June 15.

August 26th. Diarrhœa came on two days since, attended with constant pain in the epigastrium. Hæmoptysis, &c. as before.

August 28th. No pain whatever to-day: great debility.

September 9th. Severe headache since the 5th, which neither cups or blisters have in any degree mitigated.

September 14th. Headache continues, with great exhaustion, fetid breath, slight return of diarrhœa, and some delirium.

The patient continued to decline until the 29th of September, when he died without pain or distress.

Autopsy, assisted by Drs. C. A. Porter, J. W. Paul, Allen, Bacon and Thornton. Great emaciation.

The *right lung* contained a large abscess, occupying a considerable portion of the middle and lower lobes; its sides were fibro-cartilaginous, rugose within, and covered with a layer of coagulable lymph. The external wall of the cavity was formed by the ribs and intercostal muscles, to which the lung had so firmly adhered as to be separable only by tearing it. From the pulmonary abscess a short fistulous canal, about an inch in diameter, passed downwards, perforated the diaphraghm, and opened into an abscess in the liver: this second abscess was about the size of a duck's egg, with very dense, diaphanous parietes, of a fibro-cartilaginous texture, and in some places a fourth of an inch thick: but the external side of the cavity was bounded by the proximate part of the abdomen, to which the liver firmly adhered, so as completely to circumscribe the abscess: the latter was half full of thick pus and blood, mingled with some remains of cellular tissue.—The parts of the lung surrounding the abscesses were much condensed, almost entirely deficient

in respiratory structure, and of a dark red or livid colour. The liver proximate to the hepatic abscess was also condensed, hard, and of a very dark colour. The superior lobe of the right lung was perfectly sound.

The *left lung* was œdematous, but in other respects healthy.

The *spleen* presented an unusually pale colour.

The *bronchial mucous membrane* was slightly inflamed.

The other organs were not examined.

Remarks.—The preceding case is susceptible of a very simple explanation: the blow on the chest was succeeded by inflammation of the proximate organs within,—the lung, diaphragm, liver, and their tunics: suppuration and abscess followed, with the train of symptoms already enumerated. Judging from the quantity of blood found in the hepatic abscess, I attribute the principal hemorrhage to that source.

It is remarkable that the stethoscope did not detect cavernous respiration, although it showed precisely the seat of disease in the lung: but I explain the former circumstance by supposing that the lung was so condensed around the abscess, as not to expand sufficiently to admit to the latter a free access of air. The liver was suspected from the beginning, and mercurials were administered accordingly; but the complication was of a nature to be little benefitted by them. It is perhaps superfluous to add, that all the usual topical applications were tried in this case; but inhalation, the only plan of treatment which promised much advantage, was precluded by the difficulty of providing the patient with a separate apartment.

The *catarrhal phthisis* of the nosologists is a *chronic bronchitis:* when the latter is accompanied by a secretion of pus (of which we have seen the diseased mucous membrane is susceptible), the symptoms so resemble those of tubercular phthisis, that a positive diagnosis can only be attained by the stethoscope.

The following case, although it forms no variety of tubercular disease, is so interesting in its pathological features, that I introduce it without hesitation.

Case 34. *Phthisis similated by chronic catarrh from osseous concretions in the lungs.*—A lady, aged twenty-seven years, with fair though colourless complexion, very light hair, delicate person, and spine excessively deformed since her seventeenth year, consulted me for a habitual catarrh, which occurred in frequent paroxysms, attended with hectic fever, flushed cheek, erratic pains in the chest and shoulders, dyspnœa, languor, and profuse purulent expectoration, but no hæmoptysis. I repeatedly attended her during several successive years, and had little doubt of her lungs being tuberculous; but the stethoscope, the sole means of certain diagnosis, was never applied.

On the 13th of May, 1830, she experienced a severe attack of catarrh, was freely bled, had a hot saline pediluvium, and an opiate cough mixture. The following day she was much better, sat up all the afternoon, and retired to bed early in the evening, seemingly convalescent. At five o'clock the next morning she was observed to breathe and groan very heavily, and to be entirely unconscious. I hastened to see her, but found her cold, pulseless and dying, and she expired at eight o'clock.

Autopsy, assisted by Dr. Togno, twenty-eight hours after death. Emaciation not remarkable.

On opening the thorax, both pleuræ were found entirely healthy, there being no adhesions, exudation or effusion, or any signs of their ever having existed.

The lungs were compressed into two cavities at the upper and posterior part of the chest, the latter being so excessively deformed that it was difficult to conceive how respiration could be effected.

Right lung perfectly sound in its parenchyma, but its bronchial mucous membrane was inflamed in the highest degree, and contained a thick, yellow, inodorous pus, which was particularly obvious on cutting across the membranous bronchia: the larger tubes were completely filled with thin sero-mucus secretion.

Left lung also healthy in its parenchyma, excepting that it contained, in the centre of its inferior lobe, an osseous concretion the size and appearance of two peas united side to side, slightly rough on the surface, and firmly attached to the surrounding lung; but there was no cavity, no suppuration, no inflammation immediately connected with it. Not far from it was found a much smaller spheroidal concretion, of precisely similar character.

The *bronchial mucous membrane* was circumstanced precisely as on the opposite side.

Bronchial glands enlarged, but not tuberculous.

Heart, liver and *peritoneum* perfectly healthy.

Remarks.—Here were all the external signs of the scrofulous diathesis, curved spine, hectic, constant and often violent cough, and purulent expectoration, but not a solitary tubercle in any of the organs examined. It is obvious that all the symptoms arose from the irritation of the two small osseous concretions, and that the immediate cause of death was effusion into the bronchia.

I think this case is pretty strong evidence that there is no necessary connexion between scrofula and consumption.

Baron Humboldt informed the late Dr. Rush that consumption is common in Mexico, but that scrofula is unknown there.*

* Med. Inq. and Obs. vol. ii. p. 69.

CHAPTER VIII.

SIGNS OF PHTHISIS DERIVED FROM PERCUSSION AND THE STETHOSCOPE.

Percussion.—When the chest of a healthy person is quickly and firmly struck with the ends of the fingers, a peculiar tympanitic sound is produced: if a thin plate of ivory (called a pleximeter) be interposed between the fingers and integuments, the effect is more clearly and equally obtained. This mode of diagnosis, which is as old as Hippocrates, though of later years revived by Dr. Avenbrugger, is by no means an infallible guide in phthisis, but is an adjuvant of great value, and should never be omitted.

In applying the pleximeter, the two following rules are necessary to be observed:

1. Be particular to place it at precisely the same points or opposite sides of the chest; otherwise the comparison deduced from it will be fallacious.

2. Use, as near as may be, an equal force of percussion to all parts of the thorax.

If, from any cause, a portion of a lung has lost its vesicular structure, the resonance, or tympanitic sound, will be diminished in proportion: thus, if we strike the thorax beneath the clavicle in a patient whose lung is solidified by tubercular matter, or his pleura charged with effused fluids, instead

of the natural resonance, the sound is dull, and flat, like that obtained from a fleshy part of the body. There is also, when the tuberculous matter begins to soften, a peculiar sound sometimes obtained, like that from striking a cracked earthen vessel.* With these indications we at once apply the stethoscope as a more accurate means of diagnosis.

Percussion, however simple at first thought, is constantly liable to the following fallacies:

1. Where tubercles are few and disseminated, and especially where the two lungs are equally affected, I believe it impossible to detect them in this way.

2. When pneumothorax has taken place (*Case* 17), the diseased side will be much more resonant than in health; but this circumstance is readily detected by the stethoscope, for the respiratory sounds will be deficient in proportion as the lung is compressed by air.

3. Where a large abscess exists in the apex of the lung, the proximate pleura will sometimes yield a preternaturally sonorous sound, more allied to healthy resonance than the sound of pneumothorax: but here again the stethoscope solves the doubt by detecting the cavernous respiration.

Fluids effused in the pleura, old and extensive pleuritic adhesions, emphysema of the lungs, together with some minor lesions, are also causes of fallacy in the use of the pleximeter, which require the aid of another instrument.

Stethoscope.—This instrument, with which I first became acquainted at the clinical lectures† of Dr. Laennec, its celebrated inventor, is certainly among the most important acquisitions

* Laennec. † Hospital Necker, Paris, 1821, 1822.

to modern medical art. To assert that, by its aid, we can distinguish *all* the minute morbid conditions to which the lungs are subject, is more than my experience will sanction: but that it is an unequivocal resource in all considerable lesions of these organs, and especially in those attendant on consumption, there can be no doubt. In this, as in most other instances in our art, skill is the offspring of experience, and it would be unwise and unreasonable in the learner to charge his errors to the instrument. The stethoscope requires great and persevering attention; and if even with these pre-requisites, its results sometimes appear or prove ambiguous, it only shares the misfortune of almost every individual means of diagnosis with which we are acquainted.

In forming a judgment, therefore, in diseases of the lungs, the physician should avail himself of every avenue to information—percussion, stethoscopic signs, and the history of the symptoms, both as detailed by the patient himself, and manifest to observation.

The standard of healthy respiration can only be obtained by applying the instrument to the chest of a healthy person: the operator then distinctly hears the sonorous inflation of the air-cells at every inspiration, which may be compared to the whispering sound obtained by drawing one's breath with the lips nearly closed.* If this result is obtained unimpaired, and in equal degree, over the different regions of both sides of the chest (allowing, of course, for the greater thickness of the integuments, &c. over some parts than others), we may augur favourably for the soundness of the lungs; this important inference, however, should never be drawn until after

* *Pulmonary respiration* of Laennec. *Vesicular respiration* of Andral.

patient and repeated use of the instrument in a perfectly quiet apartment.

Bearing in mind that in forty-nine cases out of fifty the apex of the lung is the chief seat of tuberculous disorganization, our scrutiny is of course to be first directed to this part, on each side; and if disease exists there, it will yield some or all of the following signs:

1. *Imperfect, or partial respiration.*—When tubercles are agglomerated, or when tubercular matter has infiltrated the parenchyma, the stethoscope of course yields a dull or diminished respiration; in fact, we often observe the respiration to be obsolete in some places, imperfect in others, and again full and sonorous. These phenomena, if repeatedly obtained from the superior lobe, leave scarcely a doubt of tubercular disease. But, as before stated, when tubercles are few, and dispersed in an otherwise sound lung, they cannot sensibly affect the vesicular respiration; nor can any physical signs with which we are acquainted, detect them under such circumstances.

Unfortunately, however, this disease is not often stationary for any considerable period; and the changes which we have seen to characterize its second stage, are ascertained by the stethoscope with singular precision.

2. *Cavernous respiration.*—When the tubercular matter has softened, and made its way into the bronchia, an open abscess is necessarily formed: the existence of this change is readily detected by the stethoscope, for the air can be distinctly heard to enter the cavity at every inspiration. When the cavity is large, and the bronchial tubes opening into it are small, the air enters the former with an audible puffing sound, which has received the name of *amphoric respiration.* Where the cavity

contains considerable fluid, as frequently happens, in addition to the cavernous respiration we hear a gurgling sound, not unlike that produced by blowing gently into one end of a tube while the other is immersed in a phial of water. This is the *gargouillement* of the French, and sometimes exists to such a degree, that there is no exaggeration in illustrating it by supposing a bellows to be used in place of the glass tube. (*Case* 2.)

3. *Pectoriloquy.*—This name has been given by Laennec to a very singular phenomenon, which can only result from an abscess in the lung. Thus, if a cavity is situated near the surface of the lung, and at the same time communicates freely with the bronchia, every word the patient utters appears to traverse the stethoscope, and is conveyed to the ear of the operator as distinctly, in many instances, as the sound of the voice in conversation: such is *perfect pectoriloquy.* When, however, the cavity is small, or deep-seated, or has not free communication with the bronchial tubes, a modification of pectoriloquy is heard, called *imperfect*, because the sound of the voice appears to remain at the end of the stethoscope, not unlike the words of a person who speaks through a partition. Perfect pectoriloquy is an unequivocal proof of an abscess in the lung; though the existence of dense adhesions, the effusion of water into the pleura, and other causes, may prevent pectoriloquy from being heard, or at least render it obscure and doubtful, even where abscesses are evident from the other physical signs already noticed.

It would be foreign to my present purpose to describe the various results yielded by the stethoscope in the many complications of phthisis: for details of this kind (which embrace the whole history of pulmonary auscultation), I must refer the

reader to other sources:* but I may repeat, that the physician should never be satisfied with a single application of the instrument, but persist in its use at least once a day for several successive days; and remember that there is an obvious advantage even in varying the hours of such examination.

* Laennec, *passim*.

Rational Exposition of the Physical Signs of the Diseases of the Lungs and Pleura. By C. J. B. Williams, M.D.

Dr. Ryland's translation of Collin's Manual for the Use of the Stethoscope.

CHAPTER IX.

TREATMENT.

In many diseases physicians adopt, as the result of their experience, a routine practice, chiefly modified by the degrees of violence in the symptoms. It is not so in phthisis; for there is certainly no malady which assumes so many protean forms, and is attended by such diversified complications. Hence I have felt at a loss how to methodize my views on this subject, so as to avoid repetition and prolixity. It has occurred to me, however, first to notice the treatment of some of the more prominent symptoms of consumption; then to examine separately the merits of those articles of the materia medica that have been found most efficacious in its treatment; and finally, to devote a few separate observations to clothing, exercise, climate, and sea-voyaging.

Hemorrhagic symptoms.—Pathological anatomy establishes three facts to guide us in the treatment of phthisis; 1st, That the disease primarily invades the apex of the lung: 2d, That it commences by congestion of the parenchyma: and, 3dly, That, in a majority of cases, the congestion is manifested by hæmoptysis. It follows, therefore, that the judicious treatment of the latter symptom is of the utmost importance to the patient, and consequently claims the scrupulous attention of the physician.

It is a common practice with some physicians to bleed in-

discriminately in all cases of hæmoptysis,—a plan that has hurried thousands of patients to their graves, by destroying the last remains of strength. How important, then, is an accurate knowledge of the causes producing it, and of the pathological condition of the lungs at the time the hemorrhage occurs.

It should be ever borne in mind, that hæmoptysis is often a mere vicarious discharge; thus, in females with suppressed catamenia,—in persons whose hemorrhoids have suddenly ceased to bleed,—in others whose habitual issues or ulcers have dried up, copious hæmoptysis often follows, and is generally removed by restoring the obsolete or suspended function.

But when hæmoptysis occurs independent of such causes, when it invades the patient in the tranquillity of sleep, or during some great mental or physical effort, it is an almost unequivocal manifestation of what is expressively termed "weak lungs;" and where there is a predisposition to phthisis, is often an indication of its development. Even here, the varieties of constitution require equal variation in the treatment.

In persons of general good health, in a first attack, the pulse being strong and the system feverish or excited, bleeding from the arm is indispensable; and the free and timely recourse to it may save the patient from the most hopeless consequences. Ten or twelve ounces of blood, taken rapidly from a large orifice, may divert the current of the circulation and relieve the pulmonary congestion. With this primary precaution may be associated some internal remedies, such as spirits of turpentine, elixir of vitriol, common salt, opium, sugar of lead, &c. Any one of these, repeated a few times at short intervals, will answer a good purpose. If by these means the hemorrhage is not speedily relieved, let two or three cups be placed on each infra-clavian region: but whether the cups be necessary or not, it is always desirable to establish a drain there, in the first place

by a blister and subsequently by an issue, or tartar emetic plaster. Perfect rest, and a diet of gum water and farinaceous food, will generally restore the patient so much in the course of a week or ten days as to permit of removal to the country, which is of the utmost importance to convalescence; for what most promotes the general health, will most promote absorption of the congested blood,—without which process disorganization must rapidly follow.

The danger of inducing a return of the hemorrhage, is often urged against sending patients to the country soon after an attack of this kind. I believe with Dr. Beddoes, "such objection to be totally unfounded. In hæmoptysis and pulmonary hemorrhages, I never observed any bad consequence from travelling in a carriage: on the contrary, I have known these discharges to stop on a journey, though previously they had, for many days, occurred at least once in twenty-four hours."*

When, however, hæmoptysis takes place after a protracted and unequivocal manifestation of other phthisical symptoms, or when it recurs after an interval of two or three months, a totally different treatment is demanded. To bleed from the arm, or otherwise to reduce the strength of the patient, is in such circumstances inadmissible; for if by a cautious use of the stethoscope, aided by other signs, the lungs are found to be cavernous, I am convinced that active depletion, in any form, only tends to aggravate and hasten the disease. What good can be expected from reducing the strength of a person, who suffers a perpetual depletion from an abscess in the lungs? The most that we can do in this variety of hæmoptysis, is to check it by the internal use of the medicines above named, and the establishment of an issue below one or both clavicles.

* Observations on the Management of the Consumptive, &c. 1801.

Tonic and alterative medicines, such as will be hereafter mentioned, are also extremely important.

In the treatment of hæmoptysis, much often depends upon having the shoulders of the patient somewhat elevated, enjoining perfect rest, and prohibiting conversation.

Once for all, I must denounce the practice of applying cold to the surface of the body to relieve pulmonary hemorrhage; it is contrary to every principle of pathology; and without materially checking the flow of blood, drives still greater quantities of it to the lungs, thus increasing the hemorrhagic congestion, and rendering the recurrence of the disorder more alarming than its onset.

It often happens that congestion of the lung takes place without terminating in hæmoptysis. It is difficult, in many instances, to decide positively on this head; it is to be suspected, however, when a person who has enjoyed previous good health feels a sensation of heat in the lungs, accompanied by oppressed breathing, languor, and alternate coldness and flushing of the skin, more especially when these symptoms occur suddenly and simultaneously. If the stethoscope shows the respiration to be dull at either apex, we may infer the existence of congestion, and treat the case, if in a robust person, by general and local depletion; but if in a constitution of a contrary description, by cups, tonics, and alterative medicines, taking care to keep the surface warm by suitable clothing, &c.

I have for several years attended a patient of a delicate constitution, who is subject to attacks like that just described; he has a strong hereditary predisposition to phthisis; the paroxysm, on one occasion, for want of timely care, resulted in hæmoptysis; but in many other instances, both before and since, he obtained entire relief by dry cupping between the shoulders, and the internal use of iodine and hydriodate of potash.

It is this state of congestion of the lung to which Dr. Rush,* forty years ago, gave the name of *pulmonary apoplexy*, —a name which has since been attributed as original to M. Laennec. The latter author, however, has given a truly original and invaluable chapter on this disease, which leaves in the mind of the practitioner but a solitary regret, arising from the fact that its only unequivocal diagnostic is a bleeding from the lungs.

2. *Catarrhal symptoms.*—It has been aptly remarked by Dr. Wilson Philip, that the mildness of the first symptoms of phthisis constitutes a great barrier to efficient practice; for we can scarcely persuade a patient that he is in danger when he suffers no pain, and scarcely any positive inconvenience; and yet, under these very circumstances, a fatal malady may be undermining the springs of life.

Without suspecting every protracted cough to be a harbinger of phthisis, it is well to remember that not only can consumption excite a cough, but a cough also may induce consumption: whence the importance of getting rid of catarrhal affections without delay.

When, however, catarrh becomes protracted, and is attended by emaciation, languor, and some fever towards or in the night, it requires great attention. It is most readily removed by leeches or cups to the infra-clavian regions; and the frequent use of gum water slightly acidulated with lemon juice, and containing a little morphia and emetic tartar.†

* Med. Inq. and Obs. vol. ii. p. 69.

† The following prescription will be found a good one:

R. Mucilaginis gummi arabici, oz. xvi.
Syrupi tolutani, oz. ij.
Morphiæ sulphatis, gr. iss. vel ij.
Antimonii tartarisati, gr. ij. Misce et signa.

A table-spoonful to be taken every two hours. When from any cause the antimony is objectionable, it may be replaced by a drachm or two of sp. nitri dulcis.

If the catarrh be of an aggravated form, whether in the first or in the more advanced conditions of phthisis, and especially when, as often happens, the cough is almost incessant, full doses of morphia should be administered, and repeated at intervals until repose is procured for the patient. A blister to the chest sometimes gives relief; but if a blister be large, and kept open by irritating substances, it not unfrequently aggravates the fever, and consequently the cough, dyspnœa and other symptoms. Blisters, therefore, should be so cautiously managed, as to create a local discharge with the least possible constitutional distress.

But I am convinced by incessant observation, that no plan of treatment so effectually banishes an incipient catarrh, or relieves a chronic one, as a change from the city atmosphere to the pure air of the country, or a sea voyage.

It often happens that a dry catarrh suddenly supervenes, causing an intolerable cough, and consequent soreness of the pulmonary apparatus. The main object is of course to restore the mucous secretion, which at once relieves the urgent symptoms. I have found a combination of copaiva with Hoffman's anodyne to produce this effect more happily than any other medicines, directing the patient at the same time to make a free use of acidulated mucilaginous or farinaceous drinks.

The important subject of inhalation I defer for another page.

We occasionally hear of consumptions that have been cured by the constant use of gum arabic, the kernels of the common black walnut, &c. These supposed consumptions have of course been cases of bronchitis, which might have terminated in phthisis, had not the cough, and its attendant constitutional symptoms, been overcome by the constant use of articles which, by supplying the fauces with an artificial mucosity, prevent that dryness of the throat which excites cough.

The *dyspnœa* is often oppressive, and mostly paxoysmal. It may be greatly mitigated, and occasionally removed, by a hot saline pediluvium, together with the internal use of a combination of camphor-water and Hoffman's anodyne.*

3. *Febrile symptoms.*—When the hectic is severe, with a full hard pulse, especially at the onset of acute phthisis, bleeding is indispensable, though it must be appealed to with caution. I make it a rule, that if the pulse becomes more frequent and irritable after venesection, (and this often happens,) to avoid its repetition, and commence the use of digitalis. The fever may be much allayed by the neutral mixture, acidulated mucilaginous drinks, with or without spirits of nitre, and by sponging the limbs with cold vinegar and water. The bowels should be regulated by magnesia, or small doses of the neutral salts, carefully avoiding all drastic or irritating purgatives. Carriage exercise in the open air should be resorted to as soon as practicable, and will be found to have a surprisingly restorative effect on the patient.

One of the most exhausting consequences of hectic is *colliquative perspiration*, or night-sweats. The most effectual check consists in sponging the limbs, and parts of the body, twice a day with a solution of alum in spirits, an ounce of the former to a pint of the latter. To this may be added the internal use of a strong infusion of sage, taking thrice a day a wine-glass full, with six or eight drops of elixir of vitriol. In many instances, a dose of this mixture taken every night at bed-time will answer every purpose. I have also, in one instance, derived signal benefit from the use of prussic acid; and also from a combination of sulphate of iron and alum.

* R. Aquæ camphoræ, oz. iv.
Liquor. anod. Hoffmani, dr. iss. M. et signa.
Dose a table-spoonful every hour or two hours.

4. *Pleuritic symptoms.*—The pleuritis that so constantly attends consumption, is not unfrequently the sole source of pain to the patient; and it is especially severe in the advanced stage, when the strength is wasted by accumulated disease. A few leeches or cups over the affected part, followed by a small blister, and this again by a poultice of bran and flaxseed, in the manner recommended by M. Broussais,* will mostly give present relief. But as the pleurisy in these cases is mostly a sequel of abscess of the lungs, the former is equally difficult to cure with the latter, and in fact is susceptible of palliation only. But fortunately, even the pleuritic stage of phthisis is often unattended by pain; for I have repeatedly after death found old and firm adhesions of the pleura, of which no indication had existed during life.

5. *Gastric symptoms.*—The pain of phthisis is often confined to the stomach and bowels, and occasions great distress. Bathing over the seat of pain with a mixture composed of equal parts of spirits of turpentine, sweet oil and laudanum, affords great relief. In other instances leeching is advisable, especially where the gastric affection causes fever, or increases that which pre-existed.

When vomiting arises from violent efforts to expectorate, it is of secondary consequence; but if it occurs from gastric irritation, we cannot do better than resort to the means just mentioned, together with occasional small doses of subcarbonate of soda in cold Seltzer water. The milder tonic infusions will sometimes assist in relieving this kind of distress.

Diarrhœa, in whatever stage of phthisis it may occur, is most readily subdued by injections of morphia dissolved in gum water, flax-seed infusion, or some other bland mucilage.

* Phleg. Chron. t. i.

It is well, at the same time, to give occasional table-spoonful doses of simple camphor water, which conduces to the same end, and has also a slightly anodyne effect.

I have also employed with signal benefit a mixture of camphor water,* laudanum and nitric acid: and where other means have failed, very small doses of calomel, combined with ipecacuanha and opium,† will be found effectual. The bark of the common dog-wood (cornus florida) made into a pretty strong infusion, constitutes a valuable auxilliary.

I have also sometimes used the Moorish apozem mentioned by Dr. Good from M. Orban, consisting of a grain of alum with a grain and a half of sulphate of iron, morning and evening, which is a most effectual check on diarrhœa.

In cases of obstinate *constipation*, much may be done by attention to diet. The use of bran-bread morning and evening, often supercedes the necessity for medicine: a tea-cup full of cream renders the bread both more palatable and more effectual. Ripe fruits are also unobjectionable. Where the patient's food does not answer the purpose, resort may be had to magnesia and rhubarb, or a simple pill of five grains of rhubarb taken every night at bed-time. The milder saline aperients are also desirable.

A Moorish physician of Tunis informed M. Orban, that a constipated state of the bowels was the best symptom in consumption; and that to promote it he gave, daily, two grains and

* R. Aquæ camphoræ, oz. iv.
Acidi nitrici, gtt. iv.
Tincturæ opii, gtt. lx. M.
Dose a table-spoonful every two hours. This combination was first used by Dr. Home.

† R. Calomel, gr. j.
Pulveris opii, gr. ij.
Ipecacuanhæ, gr. iij.
Ft. pil. vi. One to be taken every two or three hours until relieved.

a half of alum, with an equal quantity of sulphate of iron. This plan, among the Moors, was accompanied by the free use of vinegar, diluted with water and sweetened. A similar treatment has since been adopted by some practitioners in Europe; but I notice it merely on account of its novelty.*

Patients who are harassed with frequent vomitings, should observe an extremely simple diet; no other plan will avail them. Sometimes by confining the ingesta to mucilaginous drinks, for a few days in succession, the gastric irritability is greatly relieved, and occasionally removed. In one instance in which all other food was thrown up almost as soon as swallowed, equal parts of lime water and fresh milk, taken frequently, in small quantities, were retained without difficulty.

OBSERVATIONS ON VARIOUS MEDICINES, AND REMEDIAL MEASURES, EMPLOYED IN CONSUMPTION.

Digitalis.—There is often in the early stage of phthisis a frequent, irritable, hectic pulse, extremely distressing to the patient, involving great distress, wakefulness and other febrile symptoms, which bleeding only increases, and all external irritants tend to aggravate. The practitioner is naturally tempted to bleed in such a case; nor is it possible for him always to foretel the consequences of venesection: but after it has been tried without any mitigation of the symptoms, he should have immediate recourse to the tincture of digitalis. My success with this medicine has often afforded me great gratification, and from among many instances of its efficacy, I will submit one or two of the most striking.

* Good, Study of Medicine, vol. ii. 771.

A young married lady, whose lungs are tuberculous, was bled on the 18th February, 1833, by direction of a distinguished practitioner, who attended her in her accouchement three days after, which resulted favourably; but the cough, dyspnœa and fever to which she had been subject, soon returned, and venesection was repeated on the 23d. The symptoms, however, remained unsubdued, and she was bled a third time on the 18th of March, but with no better result than before. On the subsequent day a blister was applied, but although it drew well it afforded no relief. Free cupping was then resorted to; but under all this variety of treatment the symptoms, in place of being mitigated, became much worse. Under these circumstances I was requested to see her on the 26th of March. I found her with a hot dry skin, very restless and unable to sleep, with almost constant cough and oppression, and a pulse beating one hundred and sixteen in a minute, strong and corded. I proposed the tincture of digitalis in doses of ten drops, one of which was given at five P.M., and before ten o'clock at night her pulse was reduced to ninety: a second dose was then given, and on the following morning the pulsations at the wrist were but eighty per minute. Half doses were continued thrice a day for two days, and then discontinued, leaving the pulse at its natural standard. With the reduction of arterial excitement the fever almost disappeared, and the cough and dyspnœa were rendered comparatively trifling. The lady has since made a long journey with benefit, and is now in the enjoyment of comparatively good health, though by no means free from the vicissitudes of her malady.

I have also found digitalis to be equally serviceable in those violent palpitations which not unfrequently accompany phthisis, forming one of its most onerous symptoms. In a middle aged man thus affected, and whose pulse beat one hundred and fifty

in the minute, the latter in six days was reduced to ninety, at which point it could be kept by occasional recurrence to small doses of the medicine, to the infinite relief of the patient, who even indulged the fallacious idea that he was cured.

Iodine and its preparations.—Every physician is now familiar with the internal use of iodine in phthisis; and having myself used it very extensively, I am able to express an unequivocal opinion respecting it. In a large number of instances it has appeared, especially in incipient consumption, to arrest or suspend the tubercular secretion, and with it the hectic, marasmus, cough, dyspnœa, and other urgent symptoms. In administering it I have adopted the common formula,* combining it with the hydriodate of potash; but I am cautious to discontinue it whenever it is followed by sick stomach, vertigo, or any of those symptoms usually called *nervous:* for, notwithstanding the assertion of Dr. Coindet of Geneva, that he has never seen injury result from its use, several instances have occurred to me, in which the persistence in it would have certainly terminated in very unpleasant consequences.

There are again some constitutions in which it does not appear to produce any obvious effects, either for better or worse; but in a majority of cases, even in the second stage of phthisis, I have been much gratified with the results. Thus it often relieves the dyspnœa, improves the complexion, and restores the appetite, even when the advanced progress of the disease precludes all hope of recovery. A lady has assured me that whenever her cough, dyspnœa and febrile sensations warn her of a fresh accession of disease, the use of the iodine at once

* R. Iodinæ, gr. iij.
Potassæ hydriodat. gr. vj.
Aquæ distillatæ, oz. j. M.
Dose from three to five drops morning, noon and night, in a little water.

dispels the symptoms, and restores her to usual health. In another marked case, that of a middle aged man, one of whose lungs has been in a state of abscess for eight months past, I have repeatedly rescued him from alarming relapses by the iodine mixture alone.

In some instances it has so obviously improved the nutritive function, that patients have increased in flesh by its use, and at the same time recovered, in a considerable degree, a naturally florid complexion.

I prescribe iodine at every period of phthisis, avoiding it only when there is much febrile excitement, or when it produces the objectionable consequences already mentioned: but its use should be governed by the adage, that "there is nothing in our art that does good but may also do harm."

Prussic acid.—The difficulty of obtaining prussic acid of a uniform strength, has, in this country, associated its name with suspicion and uncertainty. These considerations long prevented my using it; but since I have made trial of it I have had great reason to be pleased with the results.

Prussic acid has an obviously anodyne effect; it allays pain, and induces sleep when opium or morphia are ineffectual; it reduces the hectic pulse and dyspnœa, and, above all, calms the consumptive cough. In those forms of phthisis which have been called catarrhal and pneumonic, this medicine acts with surprising promptness and efficacy.

The use of prussic acid requires great caution, and its exhibition may be governed by much the same precautions that have been suggested in respect to iodine: sick stomach, dizziness, or diarrhœa, when obviously resulting from the use of the acid (and they sometimes result from the first two or three doses), are monitions that it does not suit the patient's constitution.

In prescribing prussic acid I have mostly confined myself to a single prescription, which is a slight modification of that recommended by Dr. Granville of London,* to whom the profession is indebted for much valuable testimony in its favour. Let half an ounce of gum arabic be dissolved in seven ounces and a half of water, to which add half an ounce of syrup of tolu and twelve drops of prussic acid, prepared according to the formula of the London Pharmacopœia. Of this mixture a tablespoonful may be taken every three hours—a medium dose which I prefer in commencing the use of so powerful a medicine.

Uva ursi.—The strong recommendations of this medicine contained in the work of Dr. Bourne of Oxford, led me to several trials of it. The result is, that I have been highly pleased with its use, especially in those chronic catarrhs of old persons which often similate phthisis, without being connected with tubercular disease. I have found an advantage in combining the powdered uva ursi with subcarbonate of potash or soda.†

Sarsaparilla.—The compound extract of sarsaparilla, as now made in this city, is certainly the most efficient alterative medicine we possess, after mercury, and I have in some instances, even of tubercular disease, seen it produce a renovation of health truly surprising: it seems at once to improve the secretions, restore the appetite, and increase the strength of the patient. The timely interposition of alteratives in the incipient stage of phthisis, promises important results; and of this class of remedies none can be used with the same certainty and

* On the Internal Use of the Hydrocyanic (prussic) Acid, &c. London, 1819.

† R. Pulveris uvæ ursi, potassæ subcarbonatis, āā. dr. j. To be divided into twelve powders, one to be taken every three hours. Dr. Bourne gave fifteen grains of uva ursi in milk, at bed-time.

safety as sarsaparilla. Where there is an obvious scrofulous taint in complication with the pectoral disease, I habitually combine this medicine with the hydriodate of iron.

Tonics.—Many practitioners, fearing that tubercles are the product of inflammation, hesitate to use tonics until, from the exhausted state of the system, they can be of no use. During the presence of active fever they are injurious; but under other circumstances they may be given in every condition of phthisis. I have chiefly used the wild-cherry bark (prunus virginianus) and the Virginia snake root. The former is one of those mild, but decided tonics, which preserves the equilibrium of strength without in any degree increasing the constitutional irritation. I am averse to the use of this class of medicines in the form of tincture; they increase the fever and enfeeble the stomach, although their stimulant effect may produce a seductive, yet very temporary relief, to the invalid.

The mineral acids, the preparations of iron, the sulphate of quinine and the extract of gentian, either alone or in combination, are invaluable adjuvants in the tonic plan of treatment.

Narcotics.—These generally increase the fever, and consequently the languor of the patient; but without them sleep is sometimes unattainable, and they constitute the least of two evils. Where all the preparations of opium are found to have a deleterious effect, I have occasionally used the extracts of hyoscyamus and cicuta (and especially the former) with great advantage. Hoffman's anodyne,* and the preparations of camphor, should not be overlooked.

Of the lactucarium, so strongly recommended by Dr. Duncan, we know but little in this country; which is much to be

* As directed in *dyspnœa*.

regretted, as it certainly may be often used as a valuable substitute for opium.

Fumigation and inhalation.—It is by these means only that substances can be applied directly to a diseased lung; and when we recollect that vapours are, by this process, freely received into all the air-passages and cells, and even into the abscesses, with which the bronchia almost invariably communicate, how important is it that we should avail ourselves of this adjuvant in the treatment of consumption!

But the careless manner in which inhalation is usually regulated, has brought it greatly into disuse; and in truth, I have, from this cause, sometimes seen it do more injury than good.

The common plan of burning tar, resin, myrrh and other substances in the chambers of the sick, I have found to add to the distress of the patient, owing to the disengagement of an empyreumatic smoke.

After a fair trial with various substances, there is no one which I have prescribed in this form with equal success to tar in combination with subcarbonate of potash, in the manner recommended by Sir Alexander Crichton.*

Thus an ounce of potash is added to every pound of tar, in order that the latter may be deprived of its pyroligneous acid. The two ingredients being well mixed, should be first boiled for a few minutes in the open air, in order to disengage any impurities, and then be kept at a simmer in the room of the patient. This is readily effected by putting the composition in an iron vessel, and placing the latter over a spirit lamp, or some analogous contrivance.

In this way not only a chamber, but an entire house, is

* Practical Observations on Pulmonary Consumption, *passim*.

speedily pervaded with a most agreeable vapour, which, although it may at first excite some disposition to *cough*, both in healthy and sick persons, very soon, in a great majority of cases, allays this symptom, and with it a great proportion of the patient's distress. In truth, I have seen it act like a charm. The very first case in which I employed it, was that of a lady who had recently lost both a brother and a sister by consumption, who herself had a lung disorganized by tubercular disease, and a constitution that had already suffered greatly from this cause. From the day that she commenced the tar inhalation her cough almost entirely disappeared, and all her other symptoms became, and still continue, greatly alleviated, excepting the pleuritic pain between the shoulders. Unpromising as this case was for a first experiment, the result was so pleasing that I gladly extended the same means to other patients; and I can most strongly recommend it in tubercular consumption, as a palliative of its most harassing symptoms, and in the catarrhal and pneumonic forms of phthisis as a cure. But I agree with the author just quoted, that in any case where the skin is hot and dry, and the expectoration scanty, the tar vapour can scarcely be of service; and I am also free to acknowledge, that instances have occurred to me wherein the preceding symptoms were absent, and yet the vapour appeared to irritate, rather than tranquillize, the pulmonary organs. These exceptions, however, have been very few, and such as necessarily occur in any plan of treatment. In chronic catarrh, especially when attended with ulceration of the mucous membrane (catarrhal consumption of the systems), I know of no plan of treatment that can vie with this: the same remark will apply to those morbid conditions left by pneumonia and pleurisy, especially when accompanied with purulent expectoration and dyspnœa.

Tar fumigation was employed by the late Dr. Rush of Phi-

ladelphia, upwards of thirty years ago. His plan was to boil together equal parts of tar, bran and water.

I have not yet tried the iodine inhalation, as recommended by Sir Charles Scuddamore, because I have not met with any precise rules for its regulation; and the few attempts I have made with the vapour of chlorine, have by no means induced me to give it a preference over the tar fumigation: in truth, it has appeared to me oftener to irritate than tranquillize the cough.

The most promising cases for the employment of this class of medicines, are chronic bronchitis, accompanied by ulceration of the air-passages; or in those varieties of tubercular disease which are complicated with distressing catarrhs: it is obviously impossible, however, to foresee their effect; yet a single trial will mostly decide their beneficial or deleterious tendency.

There is a mode of inhalation long since recommended by Dr. Pearson of London, which I have observed, in one or two instances, to possess a decided controul over the cough of phthisis: I allude to the vapour of ether saturated with cicuta leaves, half a drachm of the latter in powder being kept in an ounce of the former for about a week. A tea-spoonful or two of this impregnated fluid may be inhaled at a time, and repeated thrice per diem, or oftener, according to circumstances.

I cannot here omit mentioning a new mode of treating consumption, which has lately been suggested by a highly respectable English physician, Dr. Andrew Dods.* The gentleman in question observed that *tanners* are remarkably exempt from this disease; and upon pursuing the inquiry, he found the observation corroborated by many medical men, as well as by

* London Medical Gazette, vol. iii. 1829.

the tanners themselves. Dr. Dods attributes this exemption to the inhalation of that peculiar aroma, or volatile matter, which is constantly arising from the tan-pits, during the process of tanning with bark. He, therefore, recommends that the chamber of the consumptive should be strongly impregnated with this volatile matter, by placing in it a large vessel containing a quantity of the liquor and bark that has been recently taken from a tan-pit; or, where this cannot be conveniently done, to use the refuse bark of a tan-yard, taking care, however, to change it frequently.

I have myself no recollection of having ever seen a tanner in consumption, not even in the public institution with which I am connected: but I question whether a patient would derive much benefit from the aroma, unless he conjoined with it the hardy exercise of that trade, by becoming himself a tanner.*

Setons, issues, &c.—Where pain, dyspnœa, or other irritating affections are located, as frequently happens, beneath the clavicles, a caustic issue affords the speediest relief. In using the caustic I adopt a common plan, that of making a circular hole, one inch in diameter, in a piece of soft leather; by placing the latter on the skin, and then applying the caustic potash rubbed to a paste with soap, the irritation is readily circumscribed. Patients are variously affected by caustic; some bearing it without inconvenience for many hours, while in others a large eschar speedily follows the application. When the eschar separates, the object of course is to keep up a constant discharge from the denuded surface: this may be done at first by basilicon; but subsequently, as the irritation subsides, the ointment of savin or mezereon becomes necessary.

* Dr. Chalmers long ago recommended inhalation from "a strong decoction of oak and Peruvian bark, moderately impregnated with the acid or dulcified spirit of vitriol."—*Diseases of South Carolina*, vol. ii. p. 124. 1776.

I have usually chosen the subclavian, and lower sternal regions, for these applications; but I think it is M. Portal who says, that he observed equal advantage from placing them on the upper part of the arm, in the deltoid muscle.

The use of setons is not less obvious than that of issues; but the former are much more painful, and are often objected to on account of the unsightly scars that sometimes follow them.

The eruption from tartar emetic applied to the skin, is sometimes a great resource in phthisis; but its operation is occasionally so violent as to require uniform caution in its use.

The time to interpose this class of remedies with effect, is in the onset of consumption, when a dry cough, burning of the hands and feet, pain and dyspnœa, warn the patient of impending danger; and there is this additional advantage to be derived from issues, that they do not interfere with the employment of active exercise, or long journies. I have had patients who have kept their issues open while travelling hundreds of miles over rough roads, without experiencing from them any appreciable inconvenience.

These drains should not be suddenly discontinued: it is a safer practice to renew them at prolonged intervals, and thus gradually remove the system from their influence.

Diet, &c.—It is not easy to prescribe a diet that shall meet all the emergencies of a consumptive habit; for, as every practitioner knows, what agrees with one may entirely disagree with another.

> "Try all the bounties of this fertile globe,
> There is not such a salutary food
> As suits with every stomach."

Thus I have had patients who confined themselves of choice to a milk diet, the use of vegetables, and a raw egg every morning; some could take little else than gum arabic water;

while to others, meat was obviously indispensable. Rice is well adapted to this disease; and the same may be said of all the ordinary farinaceous foods. These are particularly desirable when there is active hectic, or local inflammation; or where the patient keeps his bed, or leads a sedentary life.

But the stomach soon wearies of such aliments, and requires a change. The lighter animal foods, poultry and shell fish, may be resorted to according to the state of the patient; who, if he is capable of using exercise, and especially if he should undertake a journey, will be the best judge of what suits his stomach. If, under these circumstances, a generous diet does not impair his digestion, or aggravate his symptoms, it is unobjectionable.

Yet no idea is more fallacious, or productive of more mischief, than the popular belief, that the strength of an invalid is supported in proportion to the quantity of nutritive aliment he may be able to receive into his stomach. Thus patients are often plied with food when the appetite loaths it; and if by chance it is retained when swallowed, it acts as an irritant to the whole system, leaving the latter overcharged and enfeebled.

Extremes of diet are the fountains of disease; and he who, by an opposite plan, attempts to eradicate tubercles by confining his patient to a course of biscuit and water, and the use of vegetables, will often have the mortification to see the powers of life sink rapidly under so meagre a regimen.

Clothing.—Human caprice and extravagance are in nothing more remarkably shown than in dress: experience, disease, even death itself, convey unheeded monitions to those who yield an idolatrous homage to fashion. I am aware that on this subject it is almost in vain to expostulate; but if people have no regard for themselves, they ought at least to indulge

some for their offspring, and I submit the following brief remarks.

Whenever the surface of the body is kept so cold as to produce uneasiness and distress, the circulation of the blood there is diminished, and the internal and more delicate organs are proportionably overloaded and oppressed. This inequality, in a vital process, cannot be long kept up with impunity: according as it is sudden, or repeated, or protracted, it is capable of inducing the most afflictive diseases to which the human frame is liable—rheumatism, catarrh, inflammatory affections of the viscera, scrofula in scrofulous constitutions, consumption in those predisposed to it, &c. In fact, it may be safely asserted, that the integrity of no one of the organic functions is more essential to health than that of the skin: and I am convinced, after much observation, that a large number of the consumptions that occur between the ages of eighteen and thirty years, might have been prevented by a proper attention to dress in childhood. No infatuation is more preposterous than that which is familiarly called the *hardening* of children, by exposing them, half clothed, to every vicissitude of temperature, and by subjecting them to injudicious cold bathing. These practices are peculiarly objectionable in a climate so inconstant as ours: and I have no hesitation in saying, that where one constitution is invigorated by them, twenty are absolutely destroyed.

What is true of prevention in childhood, is of equal application in the therapeutic treatment of adults. In vain is the use of medicine, or the regulation of diet; in vain are all the other precautions that ingenuity can devise; if the skin is not kept warm, and its healthy secretion maintained by proper attention to the quantity and quality of clothing. As winter approaches, the chest of the invalid should be coated in flannel up to the

neck, and the same dress should be extended down the arms to the wrists: and where this material is insufficient to prevent the sensible access of cold, a buckskin vest ought to be worn over it. The body and lower limbs are to be protected in like manner, and particular attention given to the feet; for if the latter are habitually cold, the whole system will participate in the inconvenience.

It is well known to those who have given attention to this subject, that even Russia, with its intense cold, is a far less consumptive climate than England; and the difference is solely attributable to the Russian custom of keeping their houses warm, clothing themselves in furs, and taking particular care to preserve their feet from cold and damp.*

In Holland, which is in the same latitude with England, consumption is rare among the native population, and for the very reasons which prove an exemption in Russia.

I could mention several examples, both in children and adults, in whom the constitution has been suddenly and effectually restored, from a languid and almost hectic condition to comparatively robust health, by a timely change of dress in the manner above mentioned; and I must, once for all, repeat, that without this precaution, all other measures, whether prophylactic or remedial, will end in disappointment.

Exercise.—It is obvious from what has been said in the preceding section, that clothing modifies the climate in which we live in a most important manner: thus we may feel the vicissitudes of temperature, or not, according as we expose or protect the surface of the body: for under the latter circumstances there are but few days in the year in which the lungs, even in

* Dr. Reid, *On Consumption*, p. 201. The lower classes of people in St. Petersburgh suffer much more from phthisis than the wealthy, owing to the absence of household comforts.

this climate, cannot bear the cold of winter without inconvenience. I therefore entirely coincide in the views of my friend and preceptor Dr. Parrish,* that "vigorous exercise, and free exposure to the air, are by far the most efficient remedies in pulmonary consumption. It is not, however, that kind of exercise usually prescribed for invalids,—an occasional walk or ride in pleasant weather, with strict confinement in the intervals,—from which much good is to be expected. Daily and long-continued riding on horseback,† or in carriages over rough roads, is, perhaps, the best mode of exercise; but when this cannot be commanded, unremitted exertion, of almost any kind, in the open air, amounting even to labour, will be found highly beneficial. Nor should the weather be scrupulously studied. Though I would not advise a consumptive patient to expose himself recklessly to the severest inclemencies of the weather, I would nevertheless warn him against allowing the dread of taking cold to confine him on every occasion when the temperature may be low, or the skies overcast."

There is great practical wisdom in the preceding directions; nor need they, in my view, any other qualification than a proper distinction between fatigue and exhaustion: it is only where the latter may repeatedly happen, or where an active fever may be present, or inflammation, or abscess, that injury is liable to follow:—exceptions of which more will be said hereafter.

The once universal plan of confining the patient to his room, regulating the temperature by the thermometer, with bleeding,

* North American Medical and Surgical Journal for 1829, 1830.

† Dr. Sydenham asserted, that riding on horseback was as certain a cure in consumption as bark in an intermittent. "Stoll did not find it so in the middle of the last century; for he tells us that if a consumptive patient mount his horse, he will ride to the banks of the Styx as surely as if he were in a pleurisy." This only proves, what every one knows, that no one remedy is suited to every constitution.

low diet, and perhaps mercurials as adjuvant remedies, has now become so far superceded by the more rational practice just mentioned, as scarcely to claim a refutation. I have seen it fairly tried, both in this country and in Europe, but never with success. It has not even the merit of keeping the disease at bay; for they who are so carefully guarded from all physical agents, feel the effects of them an hundred fold on a slight exposure. How can the patient recover or support his strength, when every avenue to it is closed?

On the contrary, every person of common observation must have noticed consumptive patients, who, by persevering in the active duties of life, have protracted their existence for years, and enjoyed a considerable degree of health and recreation.

I well recollect the instance of one of my patients, who, during a protracted hectic, over which tonics had no controul, was supported to her carriage in a state of extreme debility, and after a drive of twenty minutes returned home seemingly more enfeebled than before. But, in a very few hours, the advantages became manifest; the plan was persisted in from day to day, and speedily resulted in a more than ordinary degree of health. This lady is now travelling in Europe, and is, as I am informed, entirely free from any symptoms of pulmonary disease.

Had this patient been permitted to remain in her chamber at the crisis above mentioned; had low diet and depletion been used to reduce the fever, I am entirely certain that her case would have long ago been hopeless.

To this extreme case (for such it really was) I might readily add many more, which, if not equally striking, are wholly corroborative of the practice I have adopted.

I therefore think we may adopt, as an aphorism in therapeutics, the language of the celebrated Dr. Rush, that "*The remedies for consumption must be sought for in those exercises and*

employments which give the greatest vigour to the constitution."*

Climate.—Pure air is as indispensable to healthy respiration, as good food is to perfect digestion; and both functions may occasionally be invigorated by a change of aliment. Hence it is that from the earliest ages, physicians have recommended to consumptives a change of climate by sea or by land, as best calculated to invigorate and restore a shattered constitution.

Volumes have been written on this subject, and some diversity of opinion exists both with respect to times and places. On these points I shall offer a few brief remarks.

* Med. Inq. and Obs. vol. i. p. 204. See also Cases of Pulmonary Consumption, &c., by Thomas Henderson M.D., of Washington city: published in the American Journal of Medical Sciences, vol. viii.

"*Salvadori* published, in 1787, a plan for the treatment of consumption, which he proposed to have combined from the works of Hippocrates, Bennett and Sydenham. Discarding medicine, and all exactness of regimen, Salvadori directs his patient in the morning to climb, as quickly as he can, up some eminence, till he is out of breath, and bathed in sweat, and then to place himself near a large fire to increase the perspiration. He is afterwards to change his linen, and gradually withdrawing from the fire, to partake freely of salted meat and wine."—Young, *On Consumption*, p. 329.

It cannot be denied, however, that even exercise may be abused; and I have seen the constitutions of growing boys injured by a too violent participation in gymnastic recreations. Yet the following facts, from the works of Dr. Chisholm, may be quoted in triumph by the disciples of Salvadori:

"An officer of rank in the East India company's service, several years ago, related to me a very remarkable instance of hardship and cruel treatment proving in the highest degree curative in a constitution broken down by this disease (consumption). It occurred under his own eye. After the capture of the remains of the gallant detachment under the command of Col. Baillie, by Hyder Ally, the utmost exertions were made to convey the prisoners, among whom was my informant, beyond the reach of rescue. A sergeant, one of these unfortunate men, then laboured under the worst symptoms of phthisis; and, at this time, suffered greatly from colliquative diarrhœa. The merciless enemy, regardless of his wretched situation, forced him, at the point of the bayonet, to keep up in the hurried march, for no kind of carriage was allowed. His captain, my informant, witnessed the poor man's misery, but being himself chained, he could render him no assistance, nor dare to intercede for him. After the first two or three days, the sergeant became more able to march, and before his arrival at the place of destination, all the symptoms of his disease vanished. A scanty allowance of rice was his only food."—*On the Climate and Diseases of Tropical Countries*, p. 112.

Experience has amply proved, that a mixture of sea and land air, such as exists on all our maritime situations, is unfavourable to delicate lungs; and especially where there is phthisis, or even a predisposition to it. This rule appears to be of nearly equal application in all countries; and the fact is probably, in a great measure, owing to the sudden and extreme changes in the atmosphere in such situations: for it has been observed, that several sea-bathing places in the south of England, which are protected from the north and east winds, are congenial to pulmonary invalids; while other places but a short distance off, and which are exposed to the winds in question, exert a decidedly noxious influence. The latter remark applies to nearly all the localities on our coast with which I am acquainted; indeed, north of Florida, I am not aware of a solitary exception. Even those consumptives who visit the bathing places of New Jersey in the summer season, are obviously injured by it.

Doctor Rush relates the following circumstances in illustration of the preceding facts. "In Salem, in the state of Massachusetts, which is near the sea, and exposed, during many months of the year, to a moist east wind, there died in the year 1799, one hundred and sixty persons, of whom fifty-three were consumptive." "Consumptions," adds Dr. Rush,* "are more frequent in Boston, Rhode Island and New York, from their damp winds and vicinity to the sea-shore, than they are in Philadelphia." This statement is fully corroborated by a reference to the bills of mortality for those places in later years.†

With respect to the deleterious quality of the mixed air of

* Med. Inq. and Obs. vol. ii. p. 114. † See Appendix.

our coast, Dr. Rush* gives the following additional example. "In the neighbourhood of Cape May, which lies near the seashore of New Jersey, there are three religious societies among whom the influenza prevailed in the year 1790. Its mortality, under equal circumstances, was in the exact ratio to their vicinity to the sea. The deaths were most numerous in that society which was nearest to it, and least so in that which was most remote from it."

I have known instances of consumptive patients from this place, who have been seriously inconvenienced by a few days stay in New York during a northern tour; and one of my medical friends informs me, that having taken up his residence in that city twenty years ago, he found his lungs so affected by the climate, as to be obliged to return to Philadelphia at the expiration of six months. He has now past the meridian of life, and enjoys good health.

It has been supposed, however, that there are certain situations on our coast which form an exception to the above rule, and among them may be mentioned St. Augustine, in East Florida. The winter at this place is occasionally mild and equable throughout, and, under such circumstances, has afforded a decidedly beneficial retreat. But for one such winter, I am informed that there are three which present a reversed picture. The late Dr. C. of this city was induced by his friends to pass the winter of 1829—1830 in St. Augustine. He had, when he left here, purulent expectoration, hæmoptysis and hectic fever. The winter proved of the most favourable character, and he returned home in the spring surprisingly improved in his general health. This fact induced not only himself, but many other

* Loco citat.

invalids similarly affected, to pass the following winter (1830—1831) at the same place. But, in lieu of the mild climate of the previous year, there was an almost constant prevalence of a damp, chilly north-east wind, so deleterious in its effects as to destroy many of the invalids collected there, and irreparably to shatter the feeble frames of others. Among the latter was my friend, who survived his return but a few months.

With respect to the bay of St. Louis and the Passa Christiana, both on the Gulf of Mexico, Dr. Huntt informs us that the climate is not more salutary than at Sullivan's Island, or St. Augustine; yet he remarks, that "Passa Christiana is liable to no variety of temperature—its atmosphere is warmed by the Gulf Stream, and is exempt by distance and the intervening forest from the cold air of the mountains.*

It seems necessary, therefore, to inquire what *inland* situations our country possesses, to which invalids may resort with a prospect of being benefitted by the change.

Experience has amply proved that a dry air, in conjunction with the aroma of pine forests, is most congenial to delicate lungs. The ancients sent their consumptives to the pine forests of Egypt,† which are described by Hippocrates as being dry and arid, yet refreshing to invalids.

I have myself repeatedly seen stubborn and almost inveterate catarrhs, which had resisted every mode of treatment, cured in a very few days by exchanging the city air for that

* Observations on a Change of Climate in Pulmonary Consumption. By Henry Huntt, M.D., of Washington city. Published in the *North American Medical and Surgical Journal*, vol. i. p. 282.

† "Sylvas, eas duntaxat quæ picis resinæque gratia redantur, utilissimas esse phthisicis, aut qui longa ægritudine non recolligant vires, satis constat: et illum cœli aera plus ita quam navigationem Aegyptiam proficere, plus quam lactis herbidos per montium æstiva potus."—C. Plinii, *Hist. Nat.* lib. xxiv. cap. 6.

of the pine region of New Jersey. It is not easy to give a satisfactory explanation of this fact; but it is too familiar to be doubted: and I think I have known coughs, that would have eventually induced consumption, radically cured by the change just mentioned. Thus also have I seen confirmed phthisis kept at bay, and its most distressing symptoms greatly mitigated.

But when it becomes advisable to combine a long journey with a change of air, the invalid cannot do better than direct his course from our atlantic cities to the western states, crossing the Alleganies, and travel through Ohio and Kentucky. If the autumn can be chosen, the excursion might be prolonged through Tennessee into Alabama, which is well known to afford one of the most genial and equable winter climates of this continent. On the approach of warm weather the invalid must return northward, in doing which he should avail himself of the sulphur springs in Virginia. These springs, three or four in number, are much varied in temperature and in chemical composition; and they are situated in a country of diversified natural features, and surprisingly equable temperature. Several of my patients who have visited this district, speak of it in terms of the highest commendation, as affording a delightful summer residence. How far bathing in these thermal waters may be of advantage in pulmonary affections, I have not been able to decide from personal observation; but Dr Huntt* adduces strong evidence in favour of the *red sulphur springs*, and relates some interesting cases.

The interior of South Carolina, Georgia, Mississippi and other extreme southern states, have also been highly commended as winter residences for the consumptive.

* Loco citat.

Northern tours, avoiding the sea-coast, annually prove advantageous to great numbers of invalids: even the rough and mountainous roads of the interior of Pennsylvania conduce to the same end, although, *a priori*, such a result would be deemed scarcely possible.

Whatever situations may be chosen, those will be found most congenial which possess the nearest approach to an equable temperature. All sudden changes are deleterious, especially from higher to lower temperatures.

I shall take leave of this part of my subject by stating a fact in illustration: on the night of the 27th of February 1833, the wind suddenly changed from north-west to north-east, blowing hard and extremely cold. Before morning, and in the short space of four hours, the thermometer fell about forty degrees (from fifty-five to fifteen degrees Fahrenheit). Notwithstanding the precautions taken to prevent the access of cold to their sick rooms, almost all my consumptive patients were much worse on the following day, especially in respect to cough, hectic and debility. In the Alms-house hospital, where I then had fifteen cases of phthisis, all of them suffered an obvious aggravation of symptoms, and seven died in the interval between the change of weather and the 7th of March, being eight days.

Sea-voyage and foreign climate.—Nothing appears more salubrious to the lungs than the pure air of the sea. The Romans, among whom consumption was a frequent disease, sought relief in a voyage to Alexandria;* or where this was

* "Opus est, si vires patiuntur, longa navigatione, cœli mutatione, sic ut densius quam id est, ex quo discedit æger, petatur: ideoque aptissime Alexandriam ex Italia itur."—Celsus. *De Med.* lib. iii. cap. 22.

denied by circumstances, passed a large portion of time in sailing on the Tiber.

What was familiar to antiquity, has been amply corroborated by the experience of modern times. Nothing seems, in fact, to exert a more decidedly favourable influence on the lungs than unmixed sea-air: the cough of consumption is surprisingly allayed by it; and although it might be supposed that the violent retching of sea-sickness would render the patient liable to hæmoptysis, I have known of no instance of the kind. The result is more or less favourable in all cases that have come to my knowledge.

In the ship in which I sailed for Europe in 1820, was a lady in the last stage of consumption: she was conveyed on board in an exhausted condition, and her friends took, as they supposed, their final leave of her in this world. The voyage to Liverpool occupied something more than three weeks, during the whole of which time this lady suffered such violent sea-sickness, that some were apprehensive that she could not live to reach England. On the contrary, however, although in a most enfeebled condition on her arrival in that country, her health improved so rapidly that she was able at once to use exercise in the open air, and was so much benefitted, that her original plan of passing the winter in Italy was abandoned. She remained a summer in England, and then returned to New York, where she enjoyed a comparatively renovated constitution for four years: but at the end of that period her malady made a final and fatal attack.

This instance, which fell under my personal observation, and which presented as hopeless a train of symptoms as the mind can well imagine, made a strong impression on me, and con-

vinced me that no case should be abandoned as hopeless so long as a sea-voyage remained untried.

One of the strongest proofs of the efficacy of sea-voyaging as a preventive of consumption, is derived from the exemption of sailors, (as a general rule,) from that disease. Dr. Lind says "that out of five thousand seven hundred and forty-one sailors who were admitted into the naval hospital at Haslar, near Portsmouth, in two years, only three hundred and sixty of them had consumptions; and in one fourth of these (he continues) it was brought on by bruises and falls." "Hence it may be concluded," adds Dr. William P. C. Barton, "that the exercise of sailing invigorates the lungs, and fortifies them against accidents. In addition to this fact, I may state, that out of ten hundred and forty-five patients who came under my care from the first of June 1809 to the first of June 1811, from among four hundred men exposed to a variety of climates in different parts of the United States, in the Bay of Biscay, the British Channel, the Atlantic Ocean, and in different sea port towns,—there were only *six* cases of pulmonary consumption."*

It has often surprised me, that while hundreds of persons with delicate lungs, and many of them in the last stage of consumption, annually sail from this country for Europe, we rarely, if ever, hear of any of them dying at sea. They mostly live to return; and if I may venture an opinion from the observation of many examples, I should say that in a great majority of cases life is much prolonged, and in many instances the very seeds of disease are to appearance eradicated by sea-voyaging and foreign travel.

* Notes to a Translation of Dr. Gregory's Dissertation on the Influence of Climate. Philadelphia, 1815. (De morbis cœli mutatione medendis.)

Much has been written respecting those situations beyond the sea most desirable as a residence for invalids. The works of Dr. Johnson* and of Dr. Clarke,† which have been republished in this country, should be the companions of every person who goes to Europe in pursuit of health: and if, in these treatises, he does not find the south of Europe that unalloyed paradise which he may have been led to suppose, he will be the better prepared to encounter those reverses of climate which are unavoidable even there, and require all the precautions of a more northern region.

The Americans who go on this pilgrimage mostly pass their summers between the British Islands and Switzerland, and their winters in Nice, Florence, Rome and Naples. The climate of Great Britain, and indeed of the whole north of Europe, is too much like our own to ensure any salutary advantages by the change. A Parisian winter, as I know from experience, has no advantage over our own. But the air of the south of France, and especially of Provence, is peculiarly dry, and, as a general rule, remarkably equable. Yet even in this delightful region consumption is common among the native inhabitants; and Dr. Clarke quotes from M. Fournier the striking fact, that of one hundred and fifty-four deaths in the hospital of Montpellier in a given year, more than one-third died of phthisis!

Nice, however, is the chosen spot on which the sick fix their dearest hopes. The mean annual temperature of this place is fifty-nine degrees, and the mean winter temperature forty-eight degrees. But it is subject to cold easterly winds, and during their prevalence the air is damp and foggy. The transitions

* Change of Air, or the Philosophy of Travelling, &c. By James Johnson, M.D.

† The Influence of Climate in the Prevention and Cure of Chronic Diseases, &c. By James Clarke, M.D.

of temperature are also very sudden; and I am certain that one great reason why invalids have complained so much of the winter at Nice, is, that they have gone there with their imaginations filled with a perpetual summer, and hence neglected the precaution of taking with them a sufficiency of warm woollen clothes.

"From the north-west, or mistral, which is the scourge of Provence," says Dr. Clark, "Nice is pretty well sheltered. The force of this wind seems to be broken and directed to the southward, by the Estrelles, a chain of mountains between Frejus and Cannes. But although the mistral is never experienced in its full power at Nice, or only towards its termination, when it takes a more westerly direction, the keen, dry quality of the air is very sensibly felt whilst it prevails. It sets in generally about two or three o'clock in the afternoon, and is not of long duration." "The sorocco rarely blows, and when it does, it is gentle, and not unpleasant to the feelings of invalids in general. But the sharp, chilling, easterly winds are the greatest enemy with which the invalid has to contend; and the prevalence of these during the months of March and April is admitted, I believe, by all who have felt them, to form a great objection to this climate, especially in pulmonary diseases."*

Although I spent a short period in the south of Europe, yet, not travelling as an invalid, I did not visit Nice. I shall therefore take the liberty of extracting an additional paragraph from the valuable work above quoted, and for the reason already mentioned,—that this vicinity is a sort of land of promise to the consumptives of our country.

"In consumption, the disease with which the climate of Nice

* Dr. Clark. Op. citat. 2d edit p. 120.

has been chiefly associated in the minds of medical men, little benefit, I fear, is to be expected. When this disease is complicated with an inflammatory, or highly irritable state of the mucous membranes of the larynx, trachea, bronchia, or of the stomach, Nice is decidedly an unfavourable climate; and without extreme care on the part of such patients, and a very strict regimen, the complaint will in all probability be aggravated by a residence here. Indeed, the cases of consumption which ought to be sent to Nice are of rare occurrence. If there are any such, it is when the disease exists in torpid habits, of little susceptibility, or not much disposed to irritation; and when it is free from the complications which have just been mentioned. Even the propriety of selecting Nice as a residence for persons merely threatened with consumption, will depend much upon the constitution of the individual. Dr. Skirving has met with cases which leave no doubt on his mind, that a residence for one or two winters often proves of advantage as a preventive measure, in young persons threatened with this disease; and even in some cases where there was reason to believe that tubercles already existed in the lungs, the climate has appeared to be useful. But in the advanced stage of consumption, his opinion, founded on eight years experience, accords with what has already been stated."

When I have ventured an opinion on this point, I have recommended Nice to be tried, and if not found salubrious, to exchange it for Florence or Pisa. I moreover warn the invalid not to expect a change of *climate* to do every thing for him: there must be a corresponding change of *habits*. He must not omit daily exercise in the open air, and a constant resort to such recreations as tend to cheer the mind and invigorate the body. Thus it is better to remove from one place to another,

than to remain stationary when the spirits are despondent, or novelty has ceased to refresh the senses. The air of Sicily is a good subterfuge, and an excursion among the Grecian islands might be a delightful episode in the wanderings of an invalid. Such was the voyage of Cicero, whose lungs, in younger life, are said to have been so delicate as to excite the apprehensions of his friends.

But he who sojourns in the south of Europe during the winter, must make good his retreat in the spring, and seek a more northern clime. I have never been more oppressed by the heat than in Lombardy, in the month of May. Geneva and its vicinity form, in summer, an almost unrivalled residence: northern France, and England, or the banks of the Rhine, may also be visited in turn.

It seems, however, that a strong effort has recently been made by the English physicians to enhance the salubrity of their native climate; and in the effort to do so, they have possibly been too much biassed to allow full credit to the advantages of more southern climes.* Any change, if made when the lungs are in a state of abscess, may be considered as a mere palliative; but a *timely change* of air is almost always bene-

* Sir H. Davy, in his *Consolations of Travel*, has the following passage, which I think mingles both truth and philosophy:

"In the mild climate of Nice, Naples or Sicily, where, even in winter, it is possible to enjoy the warmth of the sunshine in the open air beneath palm trees, or amidst the ever-green groves of orange-trees, covered with odorous fruit and sweet-scented leaves, mere existence is a pleasure, and even the pains of disease are sometimes forgotten amidst the balmy influence of nature, and a series of agreeable and uninterrupted sensations invite to repose and oblivion."

To which passage Dr. Johnson makes the following rejoinder:

"Yes! but when we come to be startled from this bed of roses by the sirocco or the tramontane, we find, to our cost, that, the longer the series of agreable sensations, the more susceptible do we become to the deleterious influence of the enormous transition in the climate."—*Change of Air, &c.* p. 295.

ficial. Experience has incontestibly proved that change, even when seemingly for the worse, is salutary; for M. Portal declares, that he has known consumptive persons who had contracted their disease in Provence and Languedoc, remove to Paris with advantage. The consumptive people of Flanders remove to the marshy parts of their country, where intermittents prevail, from a conviction that even this change is beneficial. With the same view, some English physicians have advised their patients to forsake the more healthy parts of the island, and visit the marshy and aguish districts of Lincolnshire.*

Dr. Mosely observed that consumptive persons who went to Montpellier for their health, were exceedingly benefitted at first, but their disease was disposed to remain stationary afterwards; under which circumstances his advice was judi-

* I am satisfied, however, that intermittent fever has not, in this section of country, proved a preservative against consumption: on the contrary, I have repeatedly known persons whose constitutions were broken up by incessant attacks of ague and fever, to die of rapidly developed phthisis.

Dr. T. R. Beck of Albany, however, has furnished, in the following letter, some interesting facts which are worthy of further investigation and comparison.

"I had lately [1823] a conversation with a very intelligent gentleman (not of the medical profession), who removed into the western part of this state some fifteen years since, at a time when the extreme parts where he settled were generally covered with forests. He remained there until the last year, and has thus been a witness of the change from a state of nature to high comparative improvement.

"In the course of his remarks, an allusion was made to the great increase of consumption generally; when he observed, that during the whole period of his residence in the western district, until within the last two or three years, that disease was unknown; and individuals coming from the New England states, with all its indications, were completely relieved, or, as is the common opinion, *cured*. This observation was made in numerous instances. As the ground is clearing and villages are forming, this exemption is now no longer experienced. During the above period, intermittents and remittents were the common diseases."

"These facts certainly go to prove the idea advanced some years ago by Dr. Wells, corroborated by observations made in Holland and Lincolnshire, of the comparative incompatibility of intermittents and consumption."—*New York Medical and Physical Journal*, vol. ii.

ciously given—to go at once to some other place in the same latitudes.

The importance of *change* of air, even in situations of seemingly equal climate, is strongly shown in the subjoined remark: "Notwithstanding the uniformity of temperature which prevails among these [the West India] islands, the effect of a change from one to another is often very remarkable in improving the health. This has been observed frequently, on a large scale, among our troops stationed in the West Indies; and, indeed, I believe one of the most powerful means of diminishing the sickness among our troops in that climate, would be to remove them frequently from one healthy island to another."*

If we were to make exceptions to every place where phthisis exists as a common disease, there would be scarcely a locality left in Europe in which the invalid could shelter himself. In reference to this subject let us next inquire respecting the island of Madeira and the Azores.

Madeira has long been an established resort for the consumptive; and those who go while any chance of improvement remains, are in a majority of instances greatly benefitted by the climate. The winter temperature of the latter ranges pretty equally from fifty-seven to sixty-five degrees of Fahrenheit, seldom falling below the former number. Even in summer it seldom rises above eighty degrees, excepting during the prevalence of a sirocco. But, notwithstanding this uniformity of temperature, no malady is more prevalent in Madeira than pulmonary consumption. Persons of all ages and of both sexes, says Dr. Gourlay,† fall victims to it; nay, whole families have at times been suddenly swept away by it. And yet, as before

* Dr. Clark. On the Influence of Climate, &c. 2d edit. p. 234.

† Observations on the Climate and Diseases of Madeira. London, 1811.

mentioned, this climate is extremely congenial to consumptives from other shores, and probably would permanently restore the health of many in the incipient state even of tubercular disease, was not the removal protracted to its last and irremediable stage.

The proper time for a residence in this island is from November to the beginning of June: at an earlier season the air is damp and chilly; at a later period, the temperature is so uniformly hot as to be injurious to all delicate constitutions.

The Azores also possess a remarkably equal temperature, and have been found of great benefit to visiters, although consumption is by no means unusual among the native inhabitants. The natural peculiarities of these islands afford ample recreation for body and mind, and aid the climate in repairing a slender constitution.

It is probable, after all, that the West India islands are the most suitable resort for the consumptive, although sufficient observations have not yet been made to allow of a fair comparison.

A highly intelligent physician, who resided several years in Jamaica, has communicated to me the following interesting facts relative to that island. He states that he never knew a case of consumption to originate there, not even among the blacks, although, among the latter class, scrofula is of common occurrence: that strangers affected with phthisis, who visit the island for their health, find the air of the lowlands much more congenial than that of the mountainous districts, and that a change from the former to the latter has ever proved fatal to the patient. The mean annual temperature in the shade, is, in the lowlands, between seventy-five and eighty-five degrees of Fahrenheit, and in the mountains between sixty and seventy-

five degrees. Perhaps no part of the world presents a more equable temperature; which is attributed to the sea-breeze during the day, and the land-breeze at night.

Barbadoes is considered a healthy island, and in the dry season would be advantageous in pectoral disease; but in the rainy months, dysentery and bilious fever are very prevalent.

The Bermudas, to which consumptive patients have often resorted from the United States, are too much exposed to the unbroken northerly winds, rendering their temperature highly variable: from which cause consumption is not uncommon in these islands; and those who go there with the disease are generally but little relieved.

But persons who resort to tropical climates for the benefit of their health, too often counteract all the advantages they might otherwise enjoy, by excesses in eating and drinking. These indulgences are generally resorted to under the plea of preventing the fevers and other diseases incident to such latitudes: a most mistaken idea, inasmuch as a system supported by such unnatural means, suffers infinitely more when disease makes its appearance; and those appliances which, under other circumstances, have a cordial and restorative effect, become wholly unavailing from previous abuse. Temperance, in all climates, is the surest guarantee of health.

Peru is remarkably exempt from consumption: my friend Dr. M. Burrough, who resided upwards of four years in Lima, informs me that he did not meet with a single unequivocal case that originated there during that period; although scrofula was not unfrequent. The same intelligent gentleman mentions, that he knew many foreigners in consumption to be much benefitted by a residence in Lima; but that in every instance

where they had been tempted to go further south into Chili, the effect on their constitutions was fatal.*

* In addition to the preceding details on the effects of various climates in phthisis, I have gleaned the following facts from various sources, and especially from Dr. Young's work, already several times quoted.—Consumption is common in Iceland. In Denmark it is of comparatively rare occurrence. In the British islands, the deaths by it are estimated at one-fifth of the entire mortality; and from my personal observations during nearly four years residence in England, Scotland and Ireland, I cannot suppose the estimate overcharged. In the city of Geneva, in Switzerland, which contains twenty-four thousand inhabitants, the annual number of deaths by consumption, on an average of three years, was forty-six, or one in five hundred and twenty-one; while in England the proportion has been estimated at one in two-hundred and twenty-four.—(Vide Chrisholm, *On Tropical Climates, Appendix.*) In Paris the deaths are one-fifth, and for all France and Germany, the proportion is about the same. Vienna, however, suffers much less than perhaps any city in Europe, the deaths by consumption not exceeding an eighth or a tenth of the gross amount. In Malta, Sicily, Egypt, Persia and British India, the disease is extremely unfrequent, and in some of these countries almost unknown.

CONCLUDING OBSERVATIONS.

It has become a trite observation, that tubercular consumption is incurable: a remark which is applied, without discrimination, to every case; and when a patient happily recovers, after having had all the symptoms of genuine phthisis, it is generally inferred that his disorder was misunderstood.

Such, no doubt, is often the case; but, nevertheless, that consumption is sometimes radically cured, there can be no question, as in *Case* 28, wherein an abscess had existed in each lung, and yet was cured by the spontaneous resources of nature. Again, *Case* 17 presents an example of a radical cure of consumption of one lung, by an almost total annihilation of its structure.

It may be said that it is not in the power of art to imitate these spontaneous cures; but granting this position, art may at least promote them. For example, if by the aid of the stethoscope an isolated abscess be detected in either lung, and the parenchyma around it remains healthy, we may sometimes, by maintaining the vigour of such a constitution, enable it to bear the process of suppuration, and at the same time prevent the extension of disease.

It is altogether probable that tubercles are sometimes absorbed; nor is it improbable, although not wholly susceptible of proof, that many of the hectic fevers which are cured by change of climate, and other means, may have been cases of

incipient tuberculous disease that have been removed by the timely interposition of art.

Even where tubercular matter is not absolutely thus removed from the lungs, its progress may be, and often is, arrested and kept at bay, until the system recovers its wonted vigour, and the morbid matter ceases to irritate. I have now in my occasional charge, persons whose lungs have certainly been tuberculous for nine or ten years, and whose health is not sensibly more impaired than it was at the onset. I lately attended a man sixty-six years of age, who died of tuberculous abscesses in both lungs: he assured me that he had experienced marked consumptive symptoms thirty years previous, and suffered particularly from profuse hæmoptysis, which, however, never recurred. His symptoms eventually assumed the acute character, and he was not confined to his bed more than three months.

A forcible illustration of the arrest or absorption of tubercular matter, has been mentioned to me by a distinguished member of the profession, who, however, at the moment of communicating the facts, was unable to refer me to the work in which they are published: they are as follow:—While Louis Bonaparte was king of Holland, a division of the French army, five thousand strong, raised in the southern provinces of France, was marched into Holland and quartered there. Tubercular consumption, in an aggravated and acute form, soon made its appearance among these young men, and so great were its ravages that hundreds were soon destroyed by it. In this state of things, the physician in chief applied to the government to save the remains of the army, by sending them back to France; which was done accordingly, excepting in the case of those who were already too ill to remove from the

hospitals. Among those who were able to return, were many already in the incipient stage of the disease, and whose symptoms were becoming daily worse; yet even these became convalescent on reaching the south of France, and no deaths by consumption occurred after the troops left Holland.

These facts show, in a remarkable manner, the effects of climate in producing phthisis, as well as in arresting, if not eradicating it.

Circumstances render it probable, that tubercles generated in infancy, lie dormant until adult age, when the vital functions having completed the human fabric, are prone to show their redundancy in diseased secretions.

The average duration of phthisis, from the first manifest symptoms to its termination, has been estimated in Europe at about four months: but in this country the period appears to me to be considerably longer. But there are cases of constitutional or spontaneous phthisis, which nothing can arrest, and which run through all the phases of this malady in the short period of four or five weeks.

Affluence is, to a certain degree, some protection against consumption, because it enables its possessors to avoid many of the remote causes of the disease; and when it does appear, to avail themselves of those resources to which poverty can never have access. Statistical observations prove, that consumption is most prevalent among the thinly clothed and badly fed inhabitants of all countries.

The influence of want on the mortality of a community, independently of starvation, is strikingly illustrated in the following facts: the years 1815, 1816 and 1817 were seasons of great scarcity in Piedmont, and especially in the metropolitan city of Milan; and the annual mortality in private practice and

in the hospitals, was as follows:—in 1815, six thousand four hundred and eighty-four deaths; in 1816, seven thousand and fifty-one deaths; and in 1817, eight thousand four hundred and twenty-six deaths; and yet the average mortality from 1818 to 1825, which were years of plenty, was but five thousand three hundred and thirty-three. This surprising difference between the periods in question, was solely owing to the scarcity of wheat, which compelled the inhabitants to eat that which was unsound, or to resort to other unsuitable articles of diet. Dr. Gioja,* from whom these facts are derived, does not state the proportion of deaths by consumption; yet if the facts were investigated, I have no doubt that this disease would be found to have destroyed a large proportion of the victims.

Although consumption thus makes its chief havoc among the poor and the miserable, we often see it invade, without distinction, the abodes of temperance, of refinement and of luxury, and number among its victims the young, the accomplished and the beautiful!

The reason of this is obvious. The midnight application of the student, the imprudence in dress so common among fashionable females, and the various excesses which too often form a part of the recreations of the wealthy, produce those same liabilities to consumption, which, though from different causes, are entailed upon the indigent and the miserable.

Tranquillity of mind is of incalculable advantage in the preservation of health, and in promoting the convalescence of the sick. The buoyant spirits so common in consumption, tend greatly to prolong life; in the first place by their direct effect on the constitution, and in the second place by inducing the

* Hawkins's *Medical Statistics*, p. 36. A work of great research and acknowledged accuracy.

patient to persevere in his accustomed active habits, by which, as we have already seen, his appetite is preserved, his sleep rendered more refreshing, the hectic moderated, and consequently the strength of the system supported and prolonged.

"The least mortality occurs in France," says Dr. Hawkins, "in the districts where ease and happiness are most common; as in the departments of Calvados, of L'Orne, and de la Sarthe; in these, one individual dies annually in fifty; but how painful a contrast is presented by the twelfth arrondissement of Paris, where the annual deaths are about one in twenty-four!"

APPENDIX.

No. I.

For the subjoined statistical information, I am wholly indebted to the politeness of my friend Dr. G. Emerson of this city, a gentleman of intimate and accurate acquaintance with this department of medical knowledge.

"The following estimate exhibits the average mortality from consumption and acute diseases of the lungs, in the four largest cities in the United States, viz. Boston, New York, Philadelphia and Baltimore.

	N. York.	Boston.	Philad.	Balt.
"Average annual proportion of the general mortality to the population, one in - - - - - - - -	39.36	44.93	47.86	39.17
"Average of the mortality from consumption alone, to the general mortality, one in - - - - -	5.23	5.54	6.38	6.21
"Average of consumption and acute diseases of the lungs, one in - - - - - - - - - - - - -	4.07	4.47	4.90	5.33

"From the above estimate it appears, that the deaths from consumption and acute diseases of the lungs, constitute a larger proportion of the general mortality of New York, than of either of the other named cities; the deaths from consumption alone being one in 5.23, and of this disease with acute affections of the lungs, one in 4.07.

a thin layer of adherent, puruloid secretion. It contained only a little mucous. Its lining membrane was covered apparently with engorged varicose vessels, giving somewhat the appearance of the transudation and staining of the coats of the stomach from engorged veins. The surrounding structure of the lungs was in a state of splenification. Left lung contained a cavity similar to the right, but more regular, with a small quantity of slightly bloody mucus. The contents of this cavity, (originally the source of the hemorrhage,) was prevented from communicating with the cavity of the pleura by a cartilaginous wall, lining its parietes, which appeared to be adventitious structure thrown out in an effort of nature to defend herself against further lesions. Large bronchial tubes communicated with the cavities. Both lungs were enormously enlarged, amounting to hypertrophy, but there was no apparent source of hemorrhage except in the abscess. The heart was rather large."

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. represents a great number of tubercles in the apex of a hepatized lung, taken from a man aged twenty years, who died of pneumonia of ten days continuance. He had, however, been subject for some time previous to the pneumonic attack, to a troublesome cough and impeded respiration. It seems probable, therefore, that the pneumonia supervened on the tubercular affection, and was caused by it; inasmuch as all parts of the lung were almost equally tuberculous and hepatized. Most of the tubercles were very minute, and among the whole series, but five or six had become softened.

Fig. 2. Portion of the superior lobe of the right lung, converted into tuberculous matter, part of which is of a brownish red colour, and part of a dull olive tint; in the midst of the mass the bronchia are seen partially destroyed, and what remains of them highly inflamed. The inferior portion is from the root of the lungs, where the bronchial glands are seen in a state of tumefaction.

The appearances in this preparation might at first glance be mistaken for those of the third, or purulent stage of pneumonia; but the difference was very obvious on dissection, inasmuch as there was no oozing of pus on incising the lung, which, on the contrary was solid and shining, and distinctly composed of miliary concretions, with a number of small, perfectly characterized tuberculous abscesses. (*See Case* 14.)

Plate II.

Fig. 1. represents part of the left lung of a man who died of consumption after five months illness: the entire organ was charged with yellowish miliary tubercles, which were in such vast numbers immediately beneath the pleura, as partially to separate that membrane, and permit it to be wholly detached without difficulty; the lung then presenting the appearance of a pustuloid eruption, as represented in the plate. Numerous small abscesses, each surrounded by a ring of crude tubercular matter, were scattered through the lung.

Fig. 2. Angular crude tubercles disseminated in sound pulmonary tissue. (*See Case* 27.)

Fig. 3. Crude tubercles, some of which have suppurated at the margin: the larger, central tubercle, embraces a portion of melanotic matter, proving that these bodies do not grow by intussusception, but by the deposit of molecules around the primary granule. (*See Case* 16.)

Plate III.

Fig. 1. Transverse section of an enormous encysted tubercle, (occupying nearly all the superior lobe of the right lung,) of a grayish yellow colour, and containing a few small abscesses. The cyst was white, subcartilaginous, and a line in thickness. (*See Case* 3.)

Fig. 2. Portion of the left lung in a hepatized state, which, towards the right side of the figure, is passing into gray induration. The central portion embraces an encysted, calcareous concretion, around which, and also in various parts of the lung, is seen a deposit of *melanosis.* The spheroidal bodies are tuberculoid granulations. (*See Case* 15.)

Fig. 3. Gelatinoid infiltration, of mixed olive and rose colour, with interspersed spots showing the transition of the infiltration into tubercular matter. The blood-vessels are destroyed, excepting their internal coat, as described at page 36.

Plate IV.

Fig. 1. Angular crude tubercles and incipient abscesses, in a mass of engorged lung. (*See Case* 18.)

Fig. 2. Funicular abscesses in the left lung; the bands of condensed, greenish tissue, are traversed by large ramifications of the pulmonary artery. (*See Case* 9.)

Plate V.

Fig. 1. Portion of the right lung of a young man who died of phthisis (commencing with hæmoptysis), after an illness of fourteen months. The pleura in this case contained a large quantity of water, and in some places adhered firmly. The middle lobe contained the large encysted abscess represented in the plate; the cyst was less than a line in thickness, and, as usual, of a subcartilaginous texture. Towards the bottom of the cavity was a cruciform cord of condensed parenchyma, in which the remains of blood-vessels were still obvious. The internal parietes of the cavity were of a straw-colour, and much corrugated. The surrounding pulmonary tissue contained irregular, blackish tubercles, with a solitary, spheroidal, crude tubercle. The bronchia opened into the cavity by four or five large orifices.

Fig. 2. Section of the left lung, representing a large encysted abscess, the internal parietes of which are covered with red, extremely vascular granulations: the hæmoptysis with which the patient was harassed for nearly eighteen months, was probably derived from this source. (*See Case* 12.)

Plate VI.

This plate presents a faithful transcript of the morbid appearances described in *Case* 22. The lower portion of the lung is solidified by grayish, tubercular infiltration: the central portion contains a large ab-

scess, and the superior part a patulous one, surrounded by incipient gangrene. The central abscess is traversed by a branch of the pulmonary artery; and the pleura, on its pericardial surface, is much thickened in consequence of inflammation.

Plate VII.

Superior lobe of the right lung, presenting several stages of gelatinoid infiltration, violet, gray and yellow, the latter being the crude state, or that which immediately precedes suppuration: hence it is observed to constitute the parietes of the abscesses. The funicular abscess at the superior part of the lung is traversed in various directions by cords, which were still pervious at the time the autopsy was made, and are obviously the remains of blood-vessels: they constitute an example of the fact mentioned in page 85,—that vessels may be pervious where they traverse cavities, at the same time that they cannot be traced beyond the parietes of those cavities. (*See Case* 2.)

Plate VIII.

Profile view of John Little, drawn from life by my friend Dr. S. D. M'Neil, and showing the deformity consequent to a dorsal tumour communicating with the lungs, and projecting over the interscapular region of the right side. (*See Case* 24.)

Plate IX.

This plate represents a section of the superior lobe of the right lung, &c. of the above named John Little. The lung is replaced by gray induration, consequent to pneumonia; it is also interspersed with yellow tubercles, with vomicæ, and gray, tuberculoid granulations. Towards the apex of the lung is seen a spheroidal cavity, surrounded by a fibro-

cartilaginous cyst: from its right, inferior margin, goes out a fistulous canal, which communicated with the bronchia: from its posterior (or left margin in the drawing) passes another fistulous canal, which traverses the space between the first and second ribs, and ramifies into smaller channels, all of which open near the junction of the ribs with the vertebræ: the latter are seen with their spinous processes totally denuded, excepting some remains of the interspinous ligaments. Between the ribs (of four of which the oval, transverse sections are seen), is a deposit of whitish, false membranes, almost three-fourths of an inch thick, which connects the ribs together and is firmly attached to the adjacent lung. The curved line to the extreme left shows the outline of the dorsal abscess, as it existed before it broke; and the vertebræ were denuded in the cavity of the abscess, as here represented.

I may add, what should have been stated with the history of the case, that the irregular, oblong mass immediately beneath the pulmonary abscess, is probably a cicatrized abscess; for the substance of it was of a white, fibro-cartilaginous structure, and completely isolated. (*See Case* 24.)

Plate X.

The larynx, and part of the trachea, in a state of intense inflammation and ulceration, the cartilages being in many places ulcerated entirely through. (*See Case* 31.)

Plate XI.

Fig. 1. Portion of the pleura, partially covered with thick, and very firm adhesions, consequent to violent and long continued pleuritis: other portions are interspersed with spheroidal and irregular masses, of the same character and derivation. The black spots, are melanosis of the sub-pleural cellular tissue. (*See Case* 20.)

Fig. 2. represents a portion of tuberculous lung, which, in conse-

quence of partial pneumothorax, has receded from the ribs, but has been prevented from an entire collapse by two flattened cords, one passing from the upper, the other from the lower lobe, and uniting at the pleura costalis. These cords, or funicular adhesions, are composed of membrane resembling the pleura, but filled with yellow, adipose matter. (*See Case* 18.)

Plate XII.

Fig. 1. Portion of a tuberculous lung, showing, immediately beneath the pleura, the remains of a small abscess which has become cicatrized and filled up with fibro-cartilaginous matter: from the remains of the abscess proceeds a long fistulous canal, which has also cicatrized, and which was at one period the medium of communication between the abscess and the bronchia. (*See Case* 27.)

Fig. 2. This plate represents the bronchial mucous membrane in a state of intense inflammation (bronchitis), with small, whitish patches of ulceration. The inflammation has also extended to the trachea. The bronchial glands are seen very much enlarged: the upper ones contain several calcareous masses; while the lower, and largest of them, embraces a surprising number of irregular, bony concretions. (*See Case* 14.)

Fig. 1.

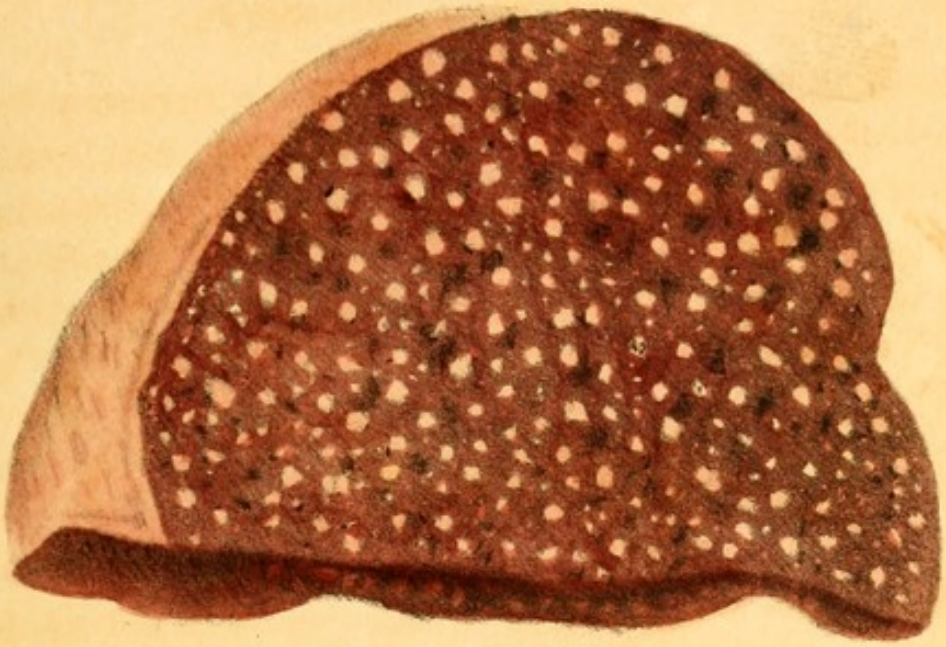


Fig. 2.

Drawn from Nature
and on Stone by A. Rider.

Printed by
Childs & Inman.

Fig. 1.

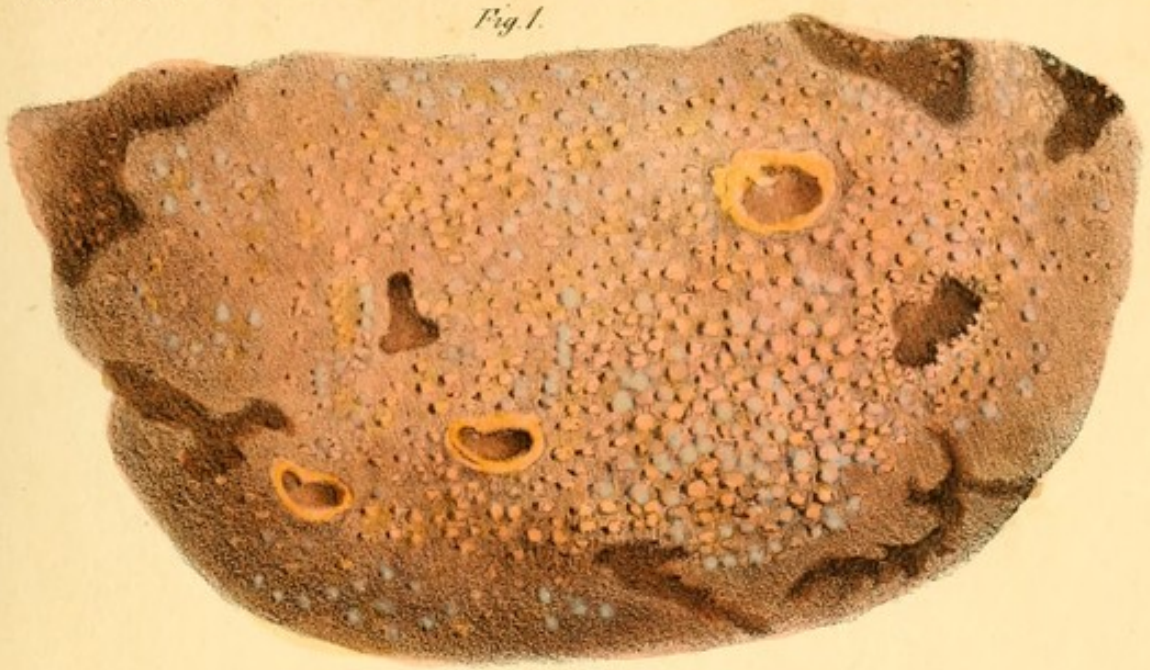


Fig. 2.

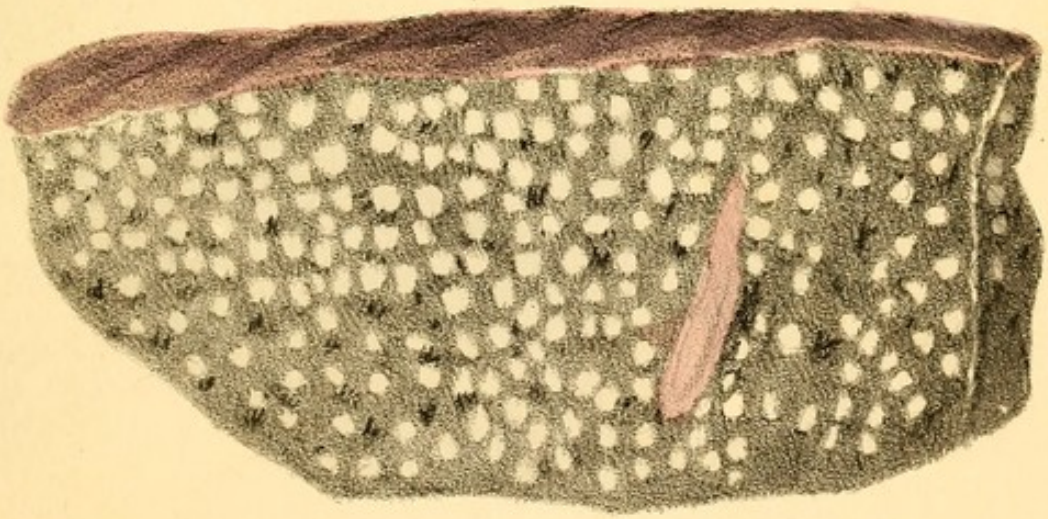


Fig. 3.

Drawn from Nature.
and on Stone by A. Rider.

Printed by
Childs & Inman.

Morton's Path. Anat.

Fig. 1.

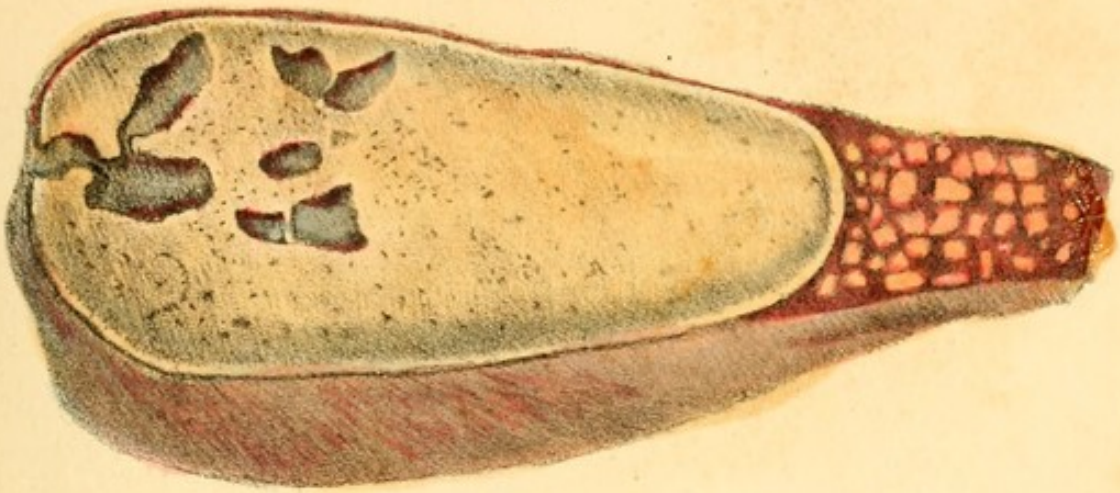


Fig. 2.

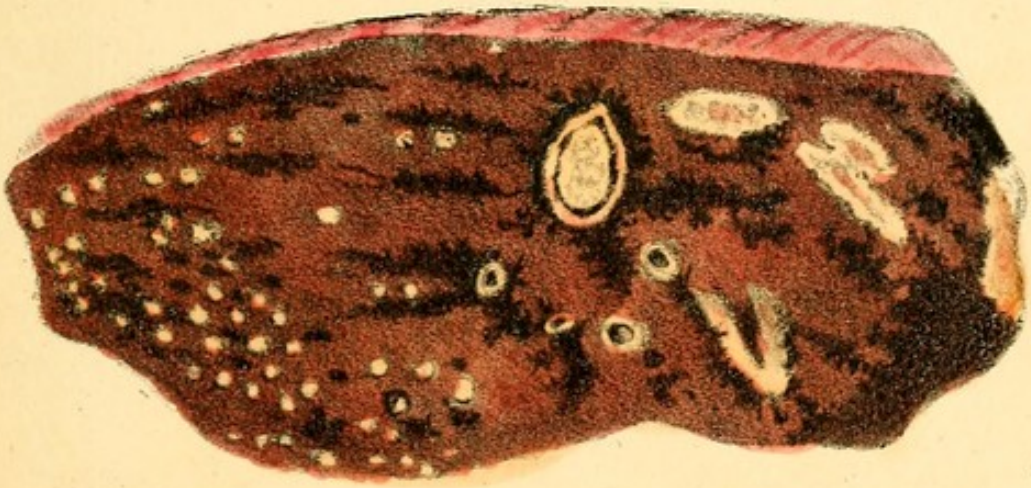


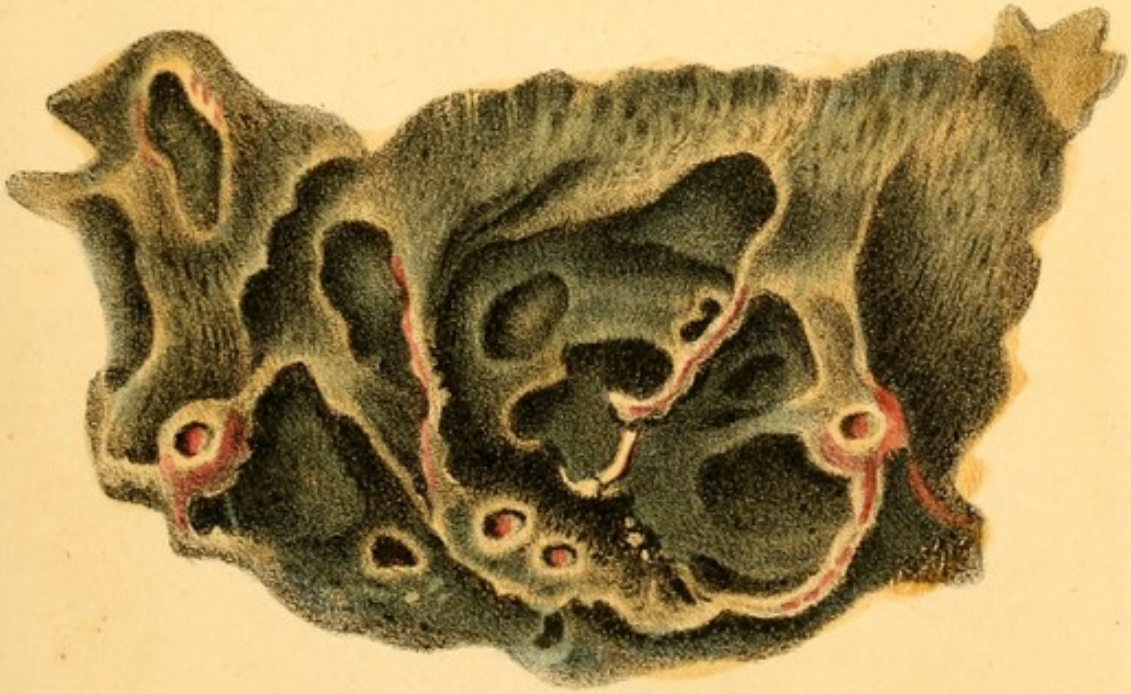
Fig. 3.

Drawn from Nature
& on Stone by J. Rider.

Printed by
Childs & Inman.

Fig. 1.

Fig. 2.



Drawn from Nature
Eon Stone by A. Rider.

Printed by
Childs & Inman.

Fig. 1.

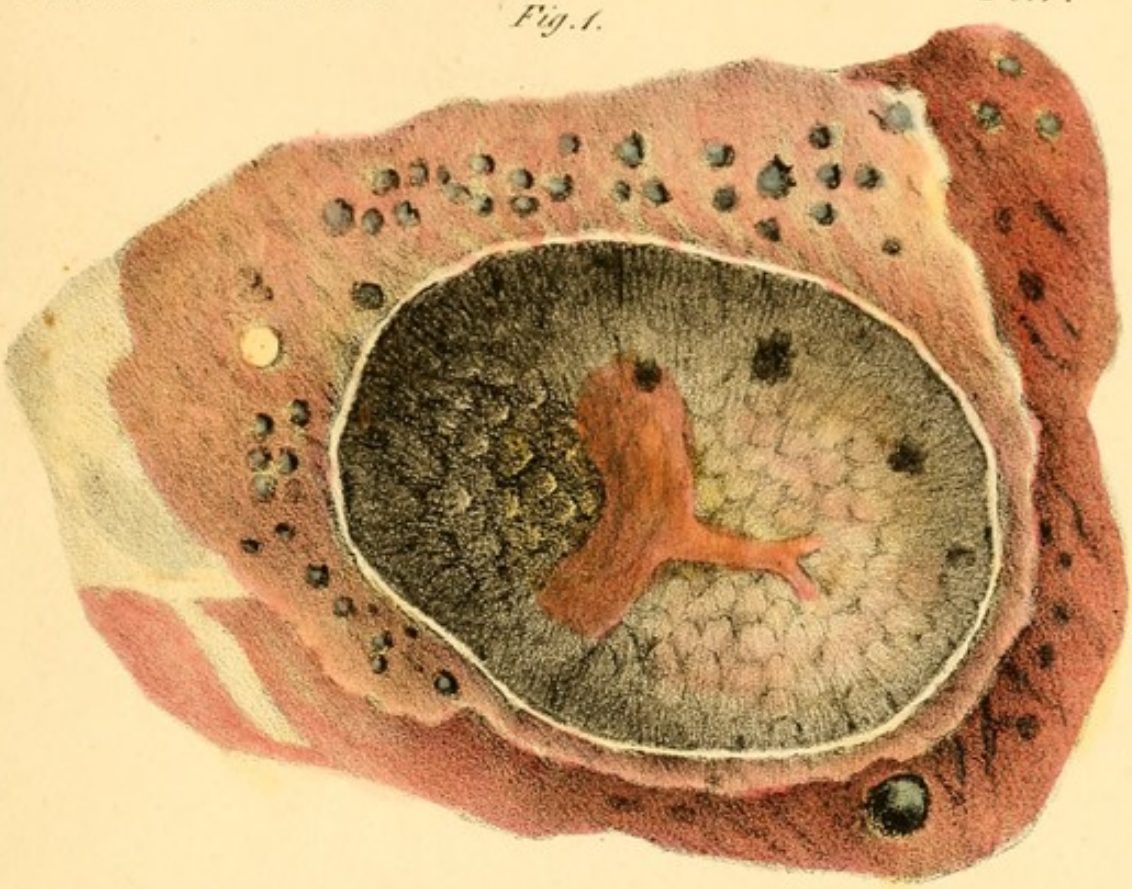
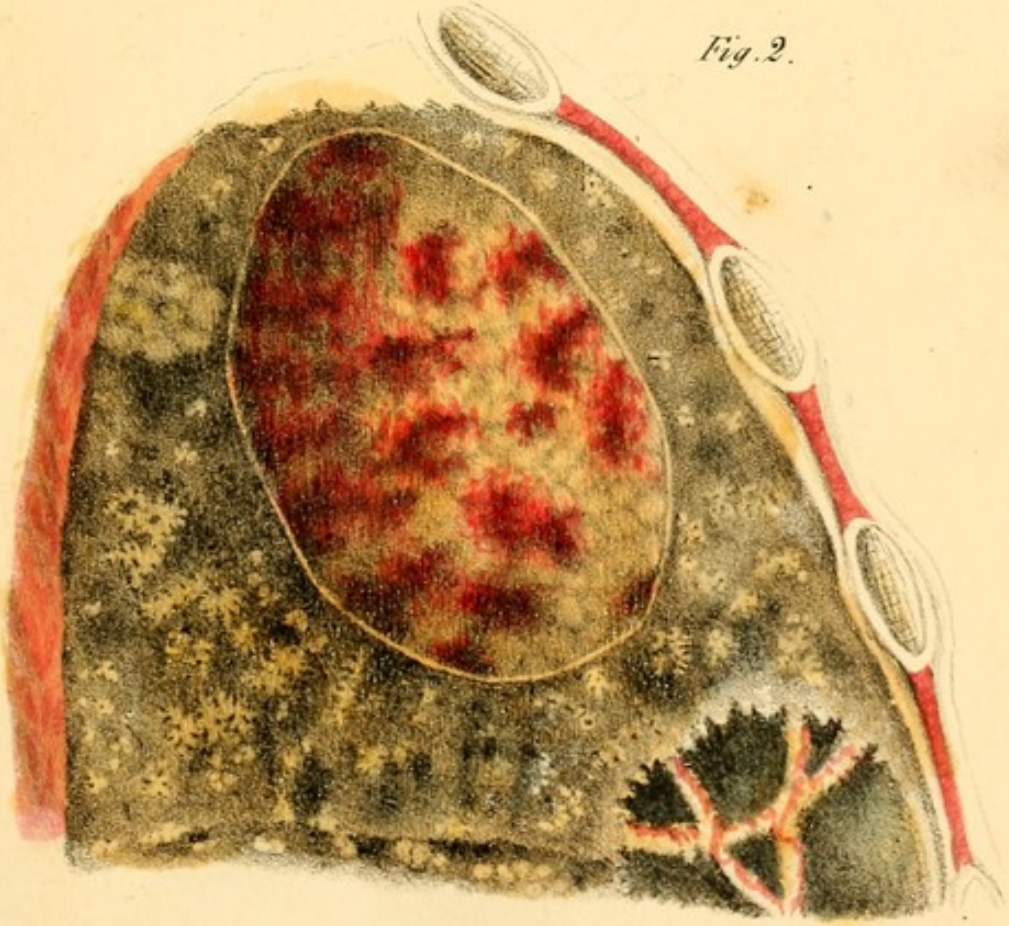
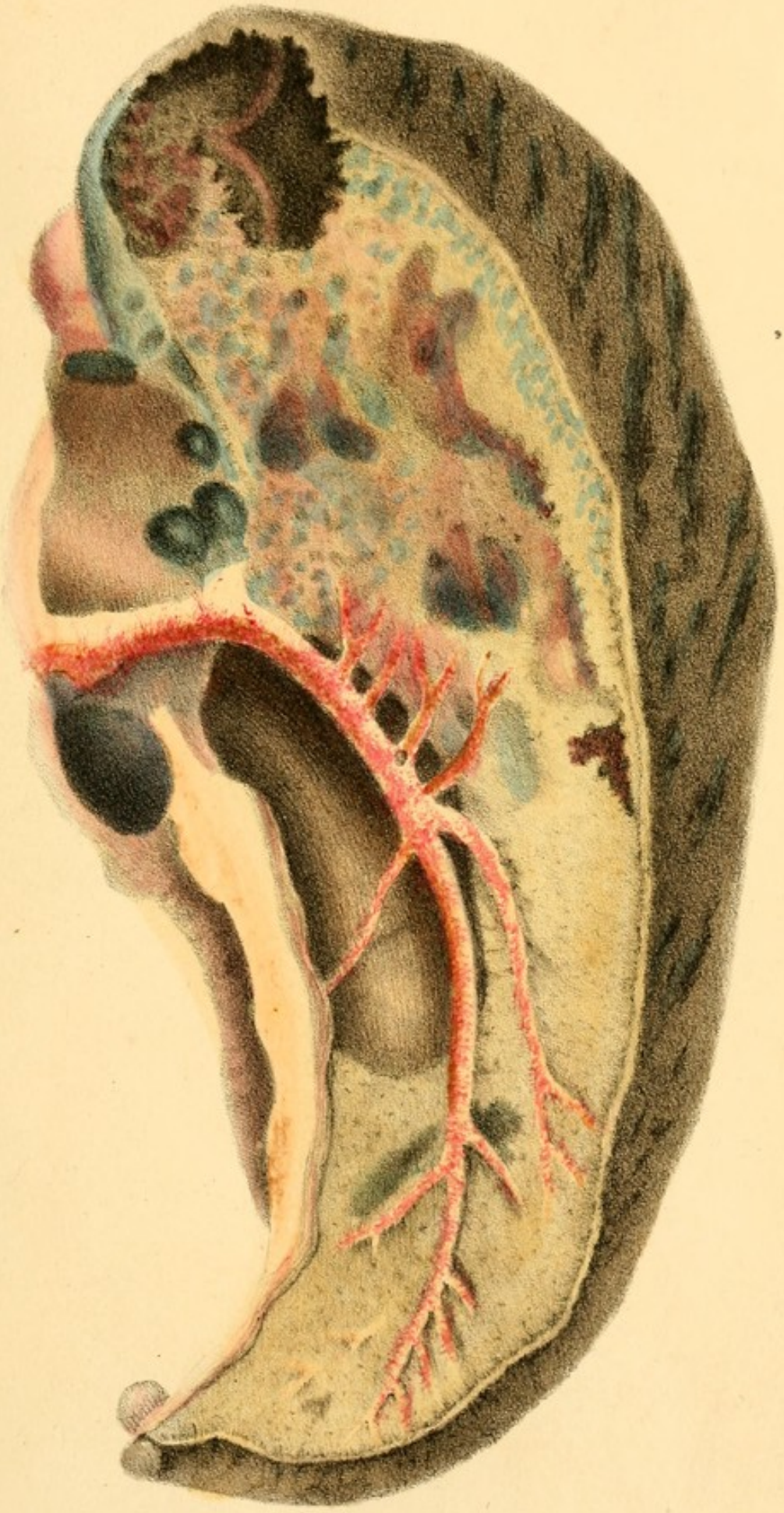


Fig. 2.



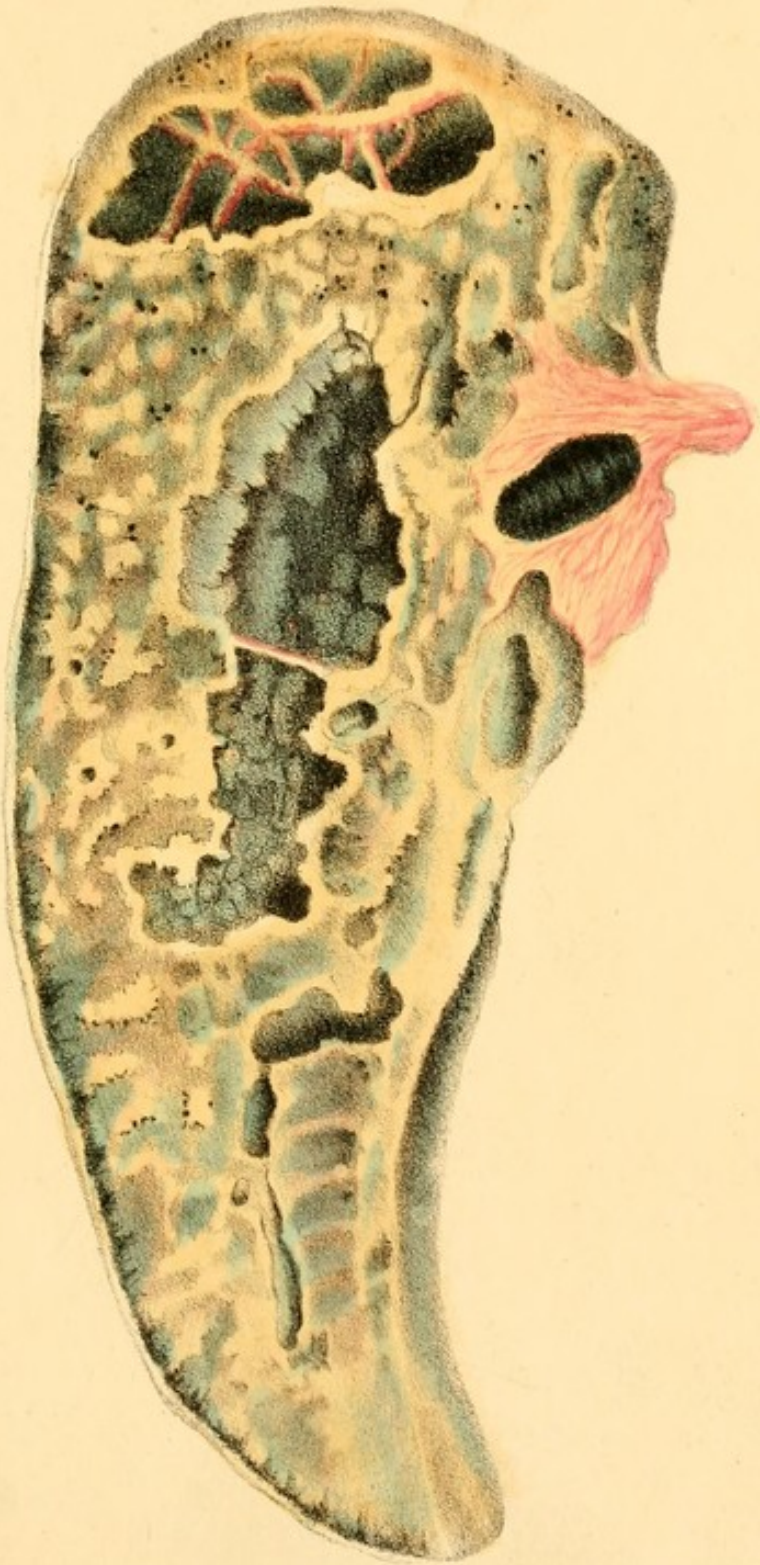
Drawn from Nature & on Stone by A. Rider.

Printed by Childe & Inman.



Drawn From Nature
On Stone by A. Rider.

Printed by
Childs & Inman.

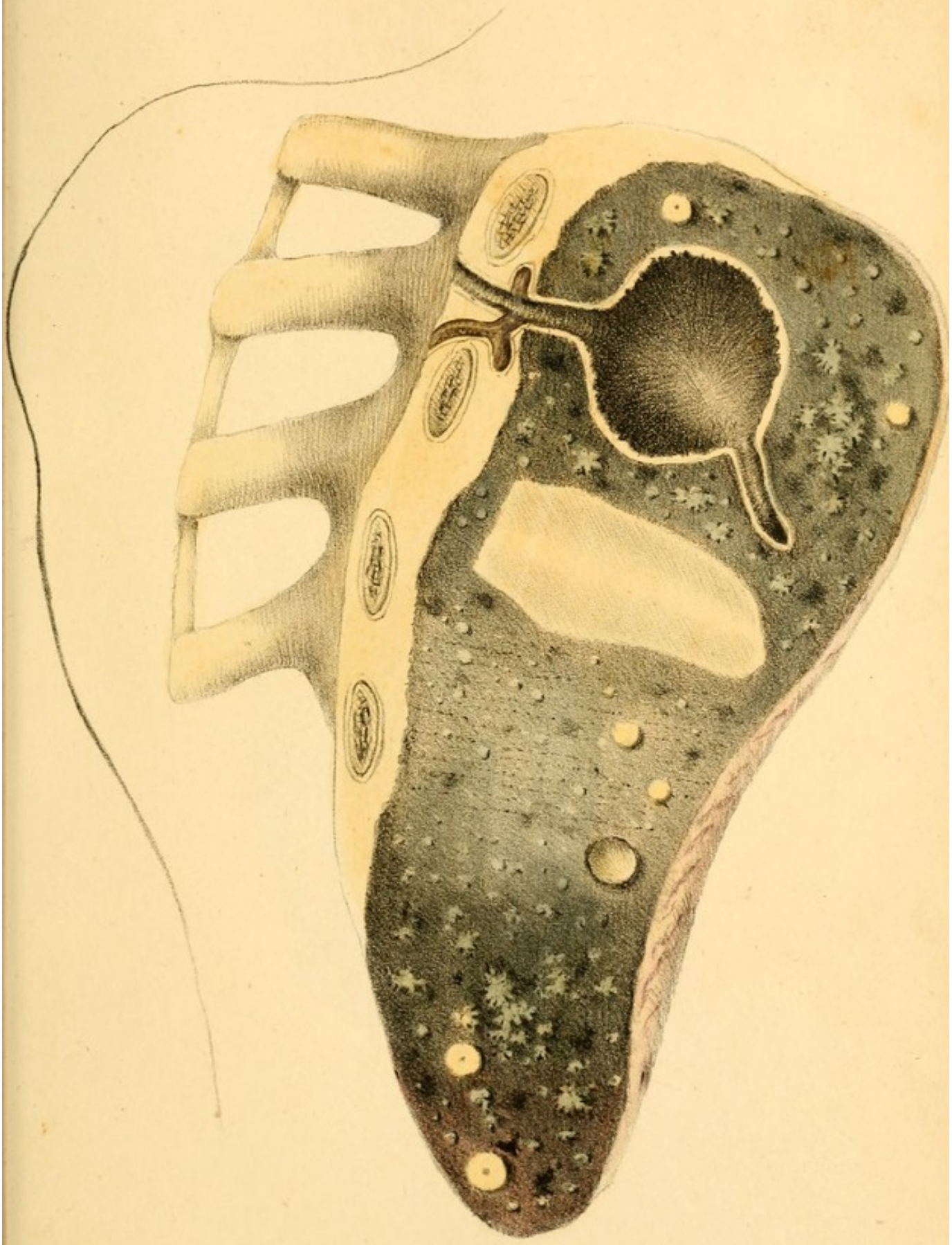


Drawn from Nature
& on Stone by A. Rider.

Printed by
Childs & Inman.

Drawn from Life
by S.D. Mc. Neil M.D.
On Stone by A. Rider

Printed by
Childs & Inman.

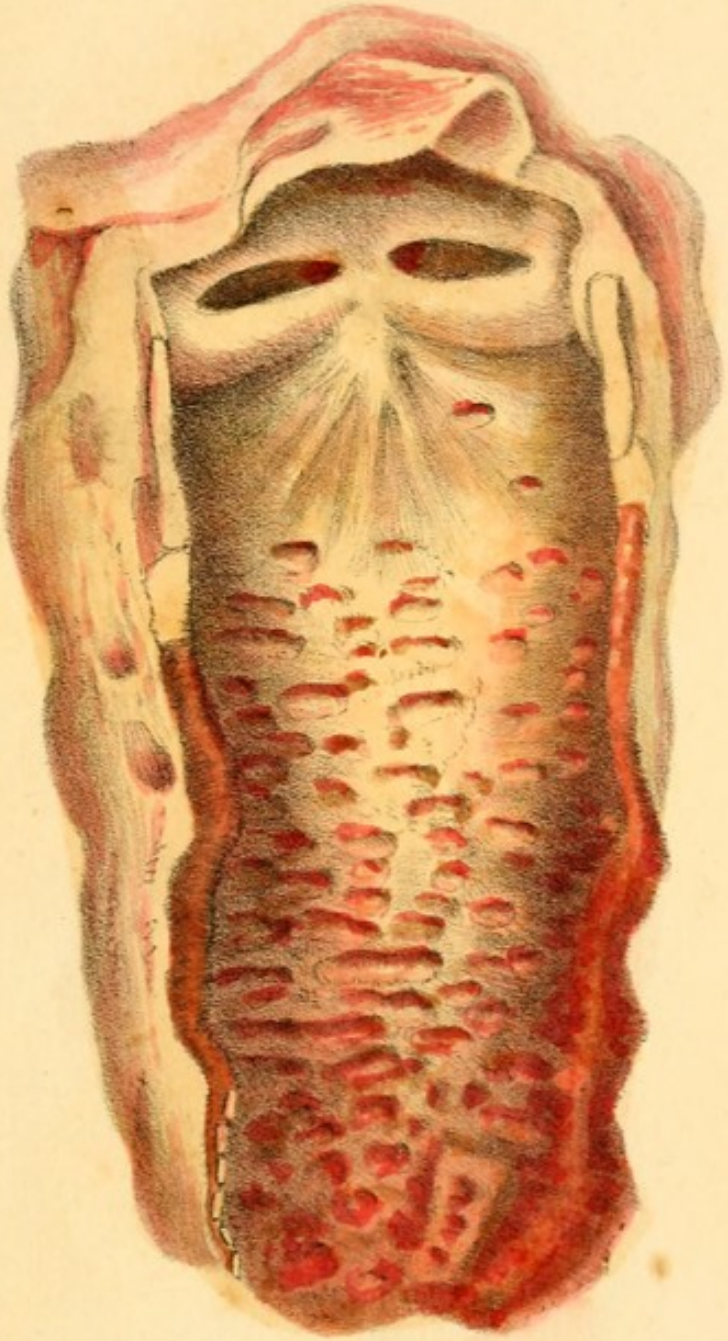


Drawn by S. G. Morton M. D.

On Stone by A. Rider.

Printed by

Childs & Inman.



Drawn from Nature
Printed by
Con Stone by A. Bilden
Childs & Jones

Fig. 1.

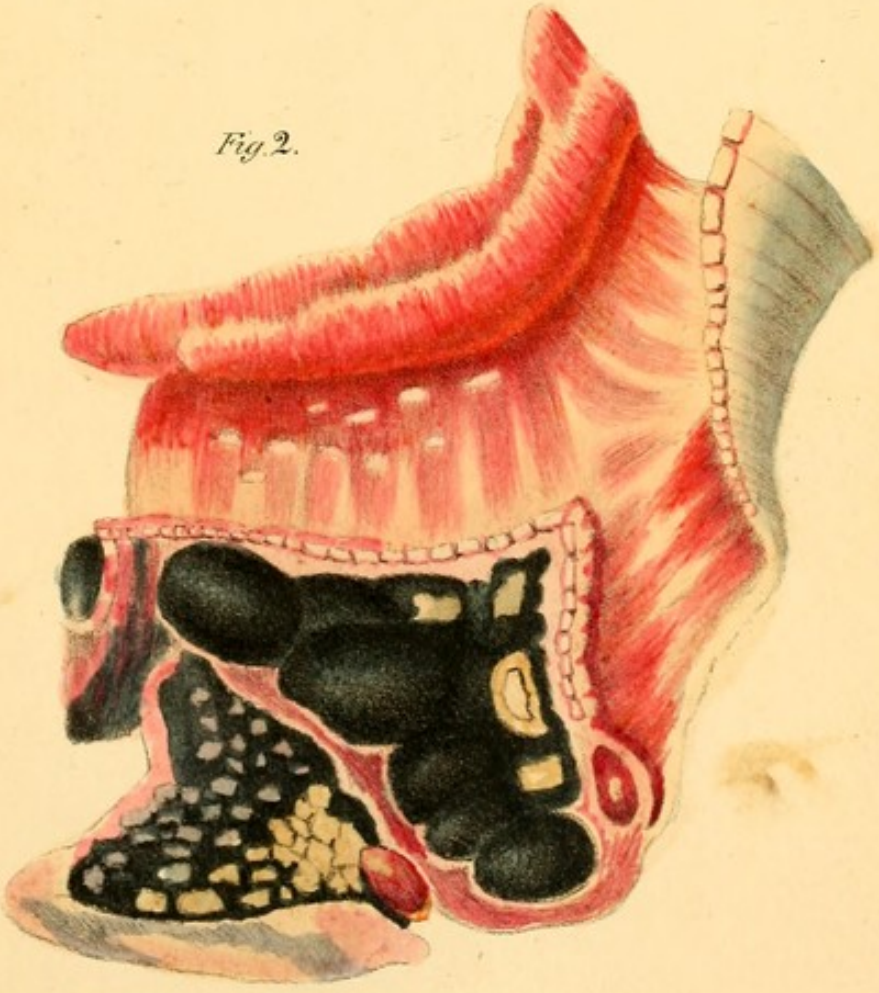
Fig. 2.

Drawn from Nature & on Stone by A. Rider.

Printed by Childs & Inman.

Fig. 1.

Fig. 2.



Drawn from Nature
on Stone by A. Rider.

Printed by
Childs & Inman.

INDEX.