

A demonstration of the curability of pulmonary consumption : in all its stages. Comprising an inquiry into the nature, causes, symptoms, treatment and prevention of tuberculous diseases in general / By Wm. A. M'Dowell, M.D.

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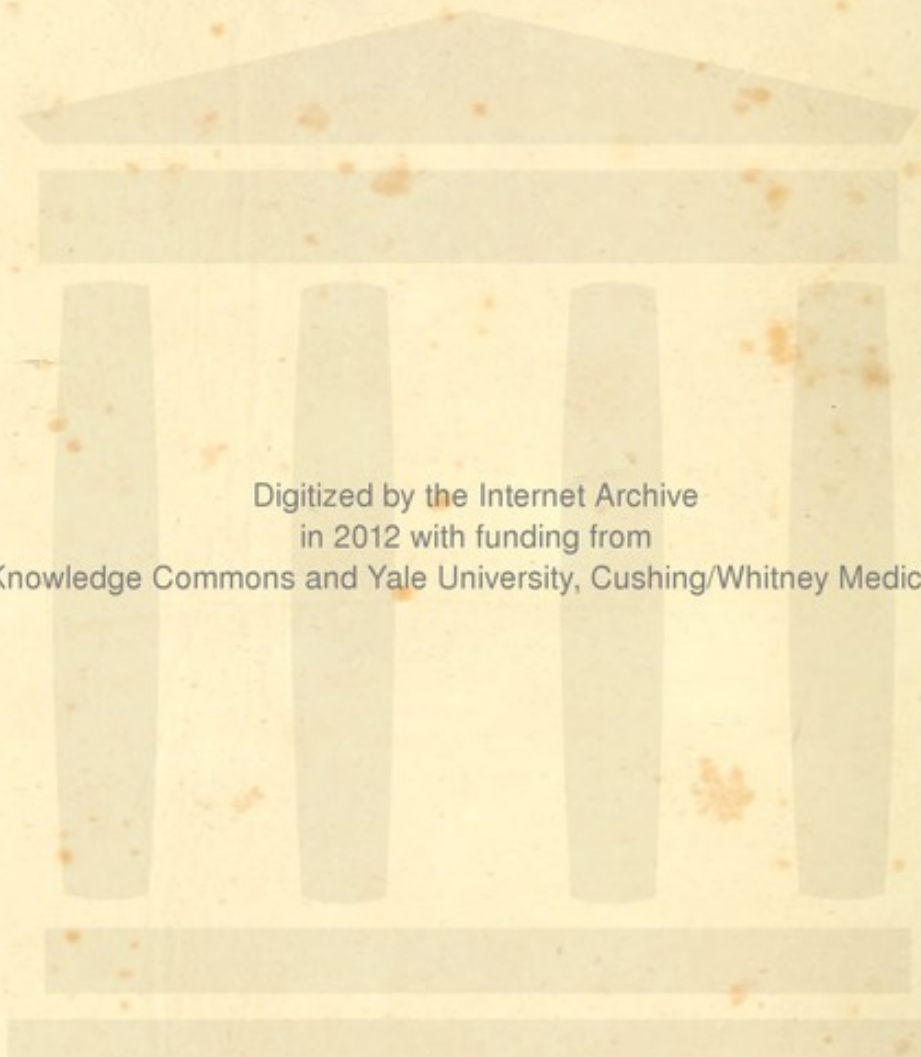
J. G. W. Palmer

Cincinnati

June 1832

FOR ABLE TO BE PRINTED IN THE

AND THE NATURAL HISTORY OF THE STATE OF OHIO



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A

DEMONSTRATION

OF THE

CURABILITY OF PULMONARY CONSUMPTION,

IN ALL ITS STAGES.

COMPRISING

AN INQUIRY

INTO THE NATURE, CAUSES, SYMPTOMS, TREATMENT,
AND PREVENTION OF TUBERCULOUS
DISEASES IN GENERAL.

BY WM. A. M'DOWELL, M. D.

LOUISVILLE, KY.

PRENTICE AND WEISSINGER.

1843.

DEMOCRAT
JOURNAL OF PULMONARY CONSUMPTION

UNITED STATES OF AMERICA, }
District of Kentucky, } *Sct.*

BE IT REMEMBERED, That on this the 14th day of November, 1842, Wm. A. M'Dowell, of said District, deposited in this office the title of a book, the title of which is in the words following, *to wit*:

"A Demonstration of the Curability of Pulmonary Consumption in all its stages, comprising an Inquiry into the nature, causes, symptoms, treatment, and prevention of Tuberculous Diseases in general. By Wm. A. M'Dowell, M. D. of Louisville, Ky." The right whereof he claims as author and proprietor in conformity with the act of Congress, entitled "An act to amend the several acts respecting Copy Rights."

ATTEST, JNO. H. HANNA, c. k. d. c.

INTO THE NATURE, CAUSES, SYMPTOMS, TREATMENT
AND PREVENTION OF TUBERCULOUS
DISEASES IN GENERAL

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BY WM. A. M'DOWELL, M. D.

LOUISVILLE, KY.
JANUARY AND FEBRUARY
1843.

PREFACE.

The author of the following essay, necessarily rests his aspirations for its success, exclusively on the intrinsic merits which it may be found to possess. These merits, whether great or trivial in themselves, could not be magnified into importance beyond their worth, by any specification admissible in the author's own preface. Yet there is a difficulty which he no doubt is not the first to have discovered, in exhibiting some indications to excite the attention of those to whom this subject is most important. There is another difficulty no less embarrassing; it is, that an effort of this nature, on which much labor of investigation, and no inconsiderable pains have been bestowed, may be prejudged without being read, particularly when it undertakes to demonstrate that to be practicable, which in the opinion of the world, is considered impossible.

To *read* is necessarily prerequisite to just appreciation, yet medical publications of the day are so numerous, so voluminous, and, withal, so many of them are written more *for* practice than *from* it, that but few medical men have leisure to winnow such heaps of chaff, in quest of the modicum of grain which they may contain. The author with neither the initials of titles or stations appended to his name, can have no reason to anticipate a preference over the mass, how-

ever magnificent may be the promises of his title page. He trusts nevertheless there may be found those who may be induced to examine at least the portion of his work which more especially touches the momentous demonstration which he claims to have made. To such he would point out the chapter on Curability, and the articles *iron* and *common salt* in the chapter on Treatment. If the demonstration set forth in the title page is not in those references made out, it has not been accomplished at all; but if made out, this unquestionably will entitle the work to a thorough reading, in the prosecution of which, nearly all the remainder will be found mainly a tissue of physiological and pathological facts substantiating the positions and arguments set forth in the chapters and articles referred to.

The chapter on Prevention is more especially designed for the benefit of the public at large; especially of this section of country, where an essay of this kind is much wanted. It has therefore been divested of all technicalities, except in cases wherein due regard to brevity demanded their retention in physiological and pathological exemplifications of prophylactic positions.

LOUISVILLE, KY., January, 1843.

INTRODUCTION.

Considering the number and ability of the works which already abound on Pulmonary Consumption, I doubt not that some justification will be expected for the appearance of an additional treatise on the subject.

With reference to the application of ordinary means of treatment, strictly in accordance with the most recent and valuable anatomical and pathological developments in phthisis, my apology for the essay which I now submit, is based on the expectation that it will contribute some appropriate hints, which, practically tested and duly improved, may lead to curative exactitude and certainty in the medical control of a ruthless and exterminating disease hitherto generally considered unconquerable.

Were further apology for this essay necessary, it might be found no less in the momentous importance of the subject; in the extensive prevalence and general fatality of the disease; in the inefficacy, when reduced to practice, of all modes of treatment hitherto proposed; than in my conviction, that my researches, experience and deductions, may happily stimulate other and abler men of the profession to revived hopes of success, in grappling with a malady which heretofore has proved such a scourge to the human family.

From the best estimates extant, there is reason to believe that not less than a fifth part of the human race

is carried off by consumption.¹ The official statistics of the hospital Des Enfants, at Paris, show that, of the deaths occurring between the ages of four and five years, the terrific proportion of three-fourths is from consumption.² "It has been calculated," says Sir James Clarke, "by the late Dr. Young, Dr. Woolcombe and others, from the best data which the bills of mortality afford, that, in Great Britain and Ireland, consumption causes one fourth part of the deaths that occur from disease. If we add to consumption, tuberculous diseases of the glandular and nervous systems and the large joints, of the spinal column, &c., and deduct the mortality which occurs during the first months of life, I shall probably be within truth in stating, that a third part of the mortality of this country arises from tuberculous diseases."

The mortality from the same causes, on the continent of Europe, is supposed to be but little short of Sir James Clarke's estimate for his own country. In the United States it is statistically known that the proportion of deaths, is, from consumption, one fifth or one sixth, as ascertained in New York, Philadelphia, Boston and Baltimore,³ and estimated throughout the rest of the Union. This, however, must be a low estimate, for, it is manifest to practical physicians, that the disease, in this country, is increasing. It is equally manifest, notwithstanding all that has been done, said, and written to throw light on pulmonary consumption, that thus far, little or no improvement has been made in its treatment, either in the Old World or the New. When this is all duly considered, I think it will not be denied that there is yet much to be done: that more writing on the subject may be excused, that

renewed ardor of investigation may be encouraged, and that persevering labor may in our day be crowned with merited success.

While vast advances in the pathology of phthisis, have been made by men of deserved eminence in this and other countries, it has been my endeavor during a considerable portion of that period, with all the aid of the lights thrown out by such master minds, to adapt a treatment of the disease to the principles they have been developing. The results of my experience, contribute, I confidently believe, an advance step in this department of medical knowledge: and I feel that I render but justice in contributing to the common stock of the profession, my mite in return for the benefits I have myself drawn from it. In the prosecution of my researches in relation to the subject now treated of, if I cannot claim to have proved an intelligent investigator, I trust it will, at least be conceded, that I have been an earnest and a deeply interested one. Deeply interested, because I was, in early life, a subject of phthisis. When attending my last course of lectures at the Pennsylvania University, in 1818, I was in an advanced stage of the disease. A gentleman, of Virginia, who had been one of my collegiate classmates, and who was afterwards one of the most distinguished medical practitioners of his native state, was also a member of the medical class of that session. He was then in a more advanced stage of consumption than myself; and we often conferred on the subject of our malady. We investigated it to the full extent of the then revealed knowledge of the disease, and, as may well be supposed, with no ordinary degree of interest and attention. But we found the most approved plans of treatment

little else than recommendations to strew with flowers the pathway to the tomb. The late Dr. Joseph Parish was, at that time, in the habit of discussing, in the Medical Society and elsewhere, his favorite treatment of phthisis—the tonic and revulsive. We were better pleased with his views than with any others we had met on the subject. We concluded upon combining his theory with an antipodal plan which we had ourselves determined to adopt, consisting of a course of dietetics and regimen calculated to produce acquired gout: for, we regarded gout as the extreme athletic, or tonic morbid condition; consumption as the extreme atonic. Accordingly, we subjected ourselves to this combined course, which proved eminently successful. We recovered rapidly and effectually. In convalescence, he kept more faithfully to our plan than I; mended faster, and consequently was the first perfectly recovered. The condition of both had been that of the tubercular diathesis, bearing the aspect and conformation characteristic of predisposition to phthisis. This disease had been destructive to many members of our respective families. When we commenced this process of treatment we were much emaciated—he extremely so. In the first year we considerably improved, gained flesh, and assumed healthy complexions. At the expiration of four years, I had become comfortably fleshy; he had grown fat. After the prosecution of a most arduous and useful career in the practice of his profession, extending over a period of nine years, he fell a victim to this anti-consumption system, having pushed it to an extreme which induced apoplexy.

At an early period after engaging in the practice of our profession, we acquired reputation for more than

common success in the treatment of consumption. This gave us the charge of more than an ordinary share of thoracic diseases, which, in their treatment, afforded us but the more reason to deplore the obscurity of the nature of the disease, and the utter want of diagnostics by which to distinguish various pulmonary disorders from each other, requiring treatment essentially different if not diametrically opposite, and to some of which our plan was decidedly injurious. Before the dawn of modern pathology had shed its light on our hemisphere, my friend was no more. Deprived of his sympathetic encouragement and cheerful participation, I was left alone in practice; to hail with rapture the pathological and diagnostic developments of the immortal Laennec.

Although admiring and applauding those wonderful pathological disclosures, and giving to them, as often as opportunity offered, autoptical attention, my main study was more especially directed to the adaptation of treatment appropriate to those morbid developments, which, I rested satisfied, had been investigated much better, and on a more extended scale, than was within the limits of either my capacity or sphere of action. There is no disease upon which more light has been thrown by the researches alluded to, than that of phthisis. It may, indeed, be considered that, in this, anatomy has been rendered perfect: and more recent investigations present a cheering prospect of additional light and knowledge, ere long, in the pathology of the disease.

In my humble effort, through this essay, to aid in effecting this most desirable consummation, I have no novelty to offer except that of an arrangement of mate-

rials, and an adaptation of well-known articles in the materia medica to a tubercular pathology more essentially humoral than heretofore presented to the profession. In this, as well as in every other part of my essay, the facts upon which my conclusions are founded, have chiefly been drawn from high sources and established authorities. Even in cases, wherein facts, in point, have occurred within my own knowledge, I have preferred quoting authorities more exalted and better known, introducing my own experience merely as corroborative. My anatomy of phthisis is principally from Laennec and Louis; my own observations coinciding best with theirs. My pathology comprises deductions from facts brought to light by various observers of pathological conditions of the blood, but chiefly through the researches of M. Andral. The blood, as far as I am aware, is the admitted source of tubercular degeneration. This in one form or another seems to be the conclusion of the most distinguished pathologists of the day. Investigators have found that the blood indicates by various changes in its condition, not only general differences in diathesis, but also minor changes in diseased action, with a degree of precision not attainable by any other system of diagnosis heretofore practised. Their researches do not seem to have been as yet directed expressly to the pathology of phthisis. But, from researches, in kindred and antagonistic disorders; from the casual observations of investigators whose works I have consulted; and from my own more especial examination of tuberculous blood; enough, I conceive, has been ascertained, to enable me to demonstrate the correctness of the *antipodal principle*. This it is my object in the present treatise to system-

atize; and to adapt medical treatment to the different stages of the disease with special reference to the conditions of the blood; and, thus, in a great measure, to induce precision and certainty in the results to be anticipated. My mode of treatment may be liable to exceptions because it is somewhat novel and peculiar; but this, I conceive, should be less objectionable when it is considered that the revival of the long dormant humoral system presents us, in fact, a new pathology. My only peculiarity consists in the application of therapeutical agents, more than usually in accordance with pathological indications that have been ascertained from actual autoptical observation of the fluids as well as the solids of the system, regardless alike of all hypotheses or pre-conceptions, whether derived from metaphysical visions or inconclusive experience. Ethical science in its present state may well be deemed an unfit source from whence to derive physical conclusions—hypotheses upon suppositions. Experience is entitled, as a general rule, to high respect and favorable consideration; but, in phthisis, such has been the fatality under all modes of practice which experience has presented, that it may more properly be regarded as a beacon of warning, than as an index pointing to the proper course to be pursued. The claim which I submit to the profession for a favorable consideration of treatment, is based on the fact that the result of my investigations and experience, enables me to define a course of treatment which I feel confident will be found as specific for the control of tubercular diseases, as the use of quinine is in febrile diseases.

I have endeavored as much as practicable to sustain my premises by results, physiological, pathological and

historical, derived from the experience and observation of others. These, together with the well known character and modus operandi of the medicines I recommend,⁵ will, I trust, without attaching undue weight to my own experience, clearly demonstrate that consumption is a disease as curable as any other to be found in the therapeutical catalogue. The citation of cases within the range of my own practice will be found unusually limited for an essay on treatment. Out of a tolerably voluminous case-book, I have quoted but two cases fully in detail. They are selected chiefly on account of their difference of character and general interest. They are given as examples of my method in the combined and actual application of various remedies, previously and separately treated of, and considerably adopted. Those two cases were so different in character, and presented each such a variety of complications, as to bring into view the whole method of treatment on which, as a general principle, I relied. The detail of treatment in other cases would, therefore, obviously be little else than repetitions of portions of the treatment of one or the other of these cases. And, moreover, it is not the relation of successful cases which most enlightens the reader. It is only in the cadaver we can find evidence of the correctness of diagnosis and of skill in the adaptation of treatment to pathology. My notes of the cadavers I have examined, would exhibit nothing new to the profession. Other cases I have quoted or alluded to, are used merely to illustrate or substantiate particular points, either with reference to treatment or pathology. More copious citations or details would not, I conceive, more forcibly present the philosophy and principles of treat-

ment I have endeavored to develope. And an unnecessarily longer catalogue of successful cases would savor too much of professional puff. It is not to be doubted that it might, at least, by many be considered an intentional exhibition, of that character. But, whether correct in this view, or whether more copious details may be necessary in a subsequent edition of this essay, will depend upon the expression of public opinion in the matter, and the appreciation of the evidences now furnished as the groundwork of my demonstration.

NOTES TO INTRODUCTION.

1. Clarke on Pulmonary Consumption.
2. Lombard.
3. Morton furnishes the following statistical report by Dr. Emerson, exhibiting the average mortality from Consumption and acute diseases of the lungs. It includes Boston, New York, Philadelphia and Baltimore.

	BOSTON.	N. YORK.	PHILA.	BALT.
Average proportion of the general mortality to the population, one in - - -	39.36	44.83	47.86	39.17
Average of the mortality from consumption, to the general mortality, one in		5.23	5.24	6.38
Average of consumption and acute diseases of the lung, one in - - - - -	4.07	4.90	5.33	6.21

4. Neither quinine nor any other remedy can be expected to cure all cases; for, man is born to die, and any disorder whatever may accomplish this destiny: but when there is extensive disorganization of important vital or functional parts and constitutional depravity, cures are not to be expected by virtue of remedies in other circumstances justly considered specific.

5. The especial *modus operandi* of the principal articles I use in the cure of consumption, more especially the powerful anti-tubercular efficacy of common salt, has heretofore, as I am aware, been but little, if at all, adverted to.

The first of these is the fact that the
 average life expectancy of the
 population has increased
 from 47 years in 1900 to
 74 years in 1950. This
 increase is due to a number
 of factors, including
 improved medical care,
 better nutrition, and
 a more healthful
 environment. The
 second factor is the
 fact that the incidence
 of many chronic
 diseases has decreased
 over the same period.
 This is due to a number
 of factors, including
 improved medical care,
 better nutrition, and
 a more healthful
 environment. The
 third factor is the
 fact that the incidence
 of many acute
 diseases has decreased
 over the same period.
 This is due to a number
 of factors, including
 improved medical care,
 better nutrition, and
 a more healthful
 environment.

Year	Life Expectancy (Years)
1900	47
1910	50
1920	54
1930	58
1940	62
1950	74

The above table shows the increase in life expectancy over the period 1900-1950. The increase is due to a number of factors, including improved medical care, better nutrition, and a more healthful environment.

CURABILITY OF CONSUMPTION, &c.

CHAPTER I.

PULMONARY CONSUMPTION.

SEC. 1. Until recently, the term Phthisis Pulmonalis, was vaguely applied to several diseases of the lungs, various in their pathological character, and requiring for their control different, and even opposite, modes of treatment. But more accurate investigations have brought modern pathologists to concur in restricting this appellation to an accumulation in the structures of the lungs of a peculiar albuminous matter, which they have denominated tubercle.

2. *Tubercle* is a term of ancient origin; it was applied by Hypocrates, and others, of the more ancient writers, to tumors generally; but, for several centuries, it has been employed only in reference to those albuminous tumors which were looked upon, until recently, as *one* of the causes of phthisis. More accurate modern pathologists deem them the *only* cause.

3. Laennec considers consumption from tuberculous depositions, "the only organic disease of the lungs capable of presenting all the symptoms and stages which belong to phthisis pulmonalis."

Out of 358 postmortem examinations of subjects of consumption reported by M. Louis, tuberculous depos-

its, or tuberculous excavations, were observed in the lungs of all with but one exception; "so that," says M. Louis, "our observations strengthen those of M. Laennec, and with us, as with him, the existence of tubercles in the lungs, is the cause, and constitutes the special character of phthisis."

4. Tubercles are tumors of a dull, yellowish-white colour, of variable sizes and consistency; which, after a certain time soften, becoming transformed into a heterogenous matter, composed of curdy masses, floating in a sero-purulent fluid; which matter, flowing into the bronchial tubes, is expectorated, leaving excavations more or less considerable in the situations which it had occupied.

5. Pathologists have found tubercles almost invariably more numerous, larger, and more matured, in the summit, than in the base of the lungs. In 123 cases, M. Louis met with but two exceptions to this rule.

6. Tuberculous tumours are generally found associated with small, white, shining bodies, of a density approaching that of cartilage; called, by Laennec, "milliary granulations," and considered by him, the first state of tuberculous formation. Those, like tubercles more developed, "are more numerous and larger at the apex, than at the base of the lungs, and limited to the former, if not existing throughout the whole extent." In the progress of their development, they present a yellow, opaque point, at the centre; those yellow portions become progressively larger, in proportion to the proximity of their situation to the summit of the lungs. So that, in examining the lungs from below, upwards, the lesions are generally seen in

the following order; 1st, grey, semi-transparent granulations; 2d, granulations less clear, and yellowish towards the centre; 3d, granulations of a yellowish-white, throughout their whole extent; that is, completely tuberculous. This last description, in a majority of cases, are the only ones observed at the summit of the lungs.*

7. "It was rare," says Louis, "to find either tubercles, or, the grey, semi-transparent granulations, existing singly in the lungs. The first of these cases we have only met with twice. The second, we have observed in five subjects; though even here there were some granulations, more or less milky and yellowish, in the centre. These facts seem to us, incontestably, to establish the transformation of the grey, semi-transparent granulations, into tuberculous matter."

8. M. Louis's observations concur with those of Laennec, that grey, milliary granulations, generally constitute the first stage of tuberculous degeneration in the lungs; yet, he has sometimes found it to be otherwise, and has almost invariably found well defined tuberculous matter to be the primitive formation, when deposited in other parts of the body. Each of those descriptions of tubercle is generally found associated with a yellowish white, jelly-like matter, termed by Laennec, gelatiniform tuberculous infiltration:† he considers this genuine tuberculous matter in the condition in which it is first infiltrated into solid tissues, from which it is subsequently changed by absorption of its more fluid portions.

* Louis.

† Laennec, on Diseases of the Chest.

9. Tubercles are variable in the lungs; they are usually scattered, but, in many cases, they are found aggregated in small groups, and sometimes in irregular masses of variable dimensions. But, in whatever form they may appear, they are constantly, most abundant in the upper lobes, if not restricted to that part of the lungs. In most cases, they occupy the interior of the parenchyma of the lungs; but in some, they are situated in contact with the pleura, where they occasionally soften and burst through, and discharge into the cavity of the chest, producing pneumo thorax.

10. Tubercles are found in both lungs in almost every case of phthisis, though seldom in an equal degree in each. Laennec has more frequently observed the right lung to be most affected. Louis, Andral, Forbes, and Morton, and most other authors, the left; Gerhard has found the two lungs about equally liable.

11. Tubercles have been found encysted; though, but very rarely; by Louis, once, only, in his vastly extensive observations.

12. *Softening of tubercles.* The softening of tubercles which indicates the arrival of the second stage of phthisis, takes place at different periods, varying from twenty days, to many months; or, according to Louis, to several years, from the commencement of the disease: the progression in this period presents the same features with that of the transformation of miliary granulations into crude tubercles; the softening commencing in the tubercles in the summit of the lungs and proceeding consecutively downwards:—we have first excavations, then softened tubercles, crude tubercles, and grey

milliary granulations, successively,—an observation of extreme importance to diagnosis. In acute cases, the softening is rapid and often takes place simultaneously over a considerable surface, sometimes embracing an entire lobe.

13. The softening process according to Laennec and Louis, commences always in the centre of the tubercle. According to Andral, generally at the centre, but not constantly; he has seen it in progress at various points, from surface to centre. Carswell says, "It begins most frequently at the circumference of tuberculous matter, or where its presence as a foreign body, is most felt by the surrounding tissues"

14. *Ulcerous Excavations.* In the process of softening and decomposition, portions of the tissue of the lungs are destroyed, together with the bronchial vessels which traverse the tuberculated part; and the tuberculous matter flows into them, and is expectorated, leaving *excavations* in the situations, whence the tubercles have been discharged.

15. The dimensions of those excavations are variable, from the size of a pea or an almond to the extent of an entire lobe, or even of the whole lung. When small, or shallow, they sometimes contract, and cicatrize. But when of the size of an egg, or larger, they more frequently remain open; and in benign cases become as it were walled round with dense semi-cartilaginous substance, which is lined by a delicate membrane of whitish yellow color, having the appearance of being continuous with the mucous membranes of the bronchial vessels which open into the cavern. In malignant cases the parietes remain soft and raw, exhibiting no indication of effort either at restoration

or limitation,* but go on increasing in size, until the cavernous space far exceeds the dimensions of the original tuberculous mass.

16. Large excavations generally communicate by fistulous openings with smaller ones about them, through which, the latter discharge their contents.

17. *Complications.* Inflammation though a frequent, has not been found a uniform concomitant of phthisis. Louis met with this complication in less than one-sixth of his cases; and when occurring, its site, he remarked, was generally the *lower lobes*. Other pathologists report it to be of more frequent occurrence; and it doubtless may often exist when the manifestation is not apparent on dissection.

18. *Bronchitis* sometimes coexists, but generally bears the appearance of a consequence, more than of a cause; the inflammation is generally restricted to those bronchiæ that enter the tuberculous caverns; when otherwise, it is worthy to be remembered, that, in contradistinction to phthisis, the *lower lobes* are the site of *bronchitis*, unless it pervade the lungs, which is rare.

19. *Pleurisy.* This complication is a common occurrence. In postmortem examinations, the existence of adhesion of tuberculous lungs to the costal pleura, is almost invariably observed. The attachment is generally by interposition of false membranes, or cellular tissue. The adhesions are, in all cases, pretty exactly in proportion to the tuberculous deposits or excavations.

20. Those adhesions, or false membranes frequent-

* Louis.

ly constitute the only barrier to a direct communication between the excavations and the cavity of the pleura.

21. In 3 cases, Louis found those false membranes converted into tuberculous matter; his researches led him to the conclusion that "the invasion of pleurisy frequently coincides with the last days of life; the period of extreme weakness and emaciation."

22. *Ulcerations of the epiglottis, larynx, and trachea,* Louis found in 102 cases, in the proportion of 18-22 and 31, respectively; the site of those ulcerations is almost always in the parts most subject to *contact with the spinta*, and is ascribed to its *erosive character*; hence we presume the extent of this complication may be looked upon as indicating the greater or less acrimony of the matter, and malignity of the case.

Louis's researches eventuate in the conclusion that those ulcerations are, "alterations peculiar to phthisis."

23. Diseased condition of the stomach in some form or other, is a general complication of phthisis. In 96 cases, Louis found the stomach thinned, and softened, 19 times: Red, and occasionally thickened, mammillated, or softened in its anterior surface, 8: Softened, and of a dull, red color, in the great cul-de-sac, 17: Mammillated of a greyish color, sometimes reddish, 2: Softened, but of natural color and consistence, 4: Of an invariably intense red color throughout its whole surface, with normal consistence and thickness, 6: Raised up by a viscus fluid, &c., 1: Apparently cicatrized, 1: Total, 77. These morbid complications are not peculiar to phthisis; but are of more frequent occurrence than in other chronic diseases, in the proportion of nearly two to one.

24. *Small intestines.* The duodenum is generally unaffected. In the jejunum and ileus, lesions are numerous; consisting of softening, thickening, redness of the mucous membrane, small sub-mucous abscesses, semi-cartilaginous or tuberculous granulations, and excavations.

Tuberculous granulations and ulcerations, appear peculiar to phthisis. Out of 95 cases Louis found the former in 36, the latter in 78 instances; while in 85, from other chronic diseases, he never saw a single instance of tuberculous granulation, and but six presented ulcerations; 3 of which had tubercles or excavations in the lungs.

25. *Large intestines.* The lesions in the large intestines have been found very similar and in about the same proportion, as in the smaller intestines, with the exception of semi-cartilaginous granulations.

26. *The liver* is occasionally found enlarged and softened, but its most frequent and most remarkable degeneration, is, "the *fatty transformation*; this lesion constantly occupies the whole liver, and may be looked upon as diagnostic of phthisis; it is almost confined to cases of phthisis; so that it may, to a certain point, be considered as depending on this affection."* M. Louis had but twice observed tubercles in the liver.

27. Those lesions of the abdominal viscera may precede or follow the formation of tubercles in the lungs; and in some cases the pulmonary and abdominal set in together.

TUBERCLES IN OTHER PARTS OF THE BODY.

28. Tubercles, though especially affecting the lungs in adults, and with very few exceptions, believed to be

* Louis.

primarily developed in those organs,* are, nevertheless, essentially the result of a general disease. There is no tissue of the human body in which their presence has not been more or less frequently detected. In some of those tissues, they are found, in early life, even more frequently than in the lungs.

29. *Transmigration.* Tubercles aggregated in one part of the body, are subject to be transferred, in part, or entire, to other parts. M. Andral has found tuberculous matter both in the veins and in the lymphatics, in transitu. (86.)

30. The consideration of this fact of transition, modifies the force of M. Louis's conclusion that the lungs are the primitive seat of tubercles. Reference to Lombard's table (34) shows, that in young subjects, in which class we should be most inclined to look for primitive formations of a transitory matter, there were more cases of tubercle in the bronchial glands, than in the lungs.

31. In 350 subjects, M. Louis found tubercles in the lungs of all with the exception of one:

“In the small intestines in a	-	-	Third.
In the great intestines, in a	-	-	Ninth.
In the mesenteric glands, in a	-	-	Fourth.
In the cervical glands, in a	-	-	Tenth.
In the lumbar glands, in a	-	-	Twelfth.
In the prostate, in a	-	-	Thirteenth.
In the spleen, in a	-	-	Fourteenth.
In the ovaries, in a	-	-	Twentieth.
In the kidneys, in a	-	-	Fortieth.
In the uterus, in	-	-	One.

* Louis.

In the brain, in	-	-	-	-	Two.
In the ureter, in	-	-	-	-	One.

32. Laennec, Andral, Lombard, and various other pathologists, furnish accounts of tubercles in the bones, muscles, spinal chord, pancreas, cartilages, &c.

33. "In children," says Andral, "tubercles, with respect to their situation, differ from those of the adult, in the following circumstances:

1st. Tubercles occur in the other organs without any being in the lungs; more frequently in children than in adults.

2d. They have also a tendency to affect a greater number of organs at once.

3d. The organs which are most frequently affected in adults, are not those which are so in children."

34. In one hundred young subjects M. Lombard found tubercles.

"In the lungs, .	-	-	-	-	in 73
In the bronchial glands,	-	-	-	-	87
In the mesenteric glands,	-	-	-	-	31
In the spleen,	-	-	-	-	25
In the kidneys,	-	-	-	-	11
In the intestines,	-	-	-	-	9
In the nervous centres,	-	-	-	-	9
In the cervical glands,	-	-	-	-	7
In the membranes of the brain,	-	-	-	-	6
In the pancreas,	-	-	-	-	5
In the gastro-hepatic glands,	-	-	-	-	5
In the sub-peritoneal cellular tissue,	-	-	-	-	5
In the spleen,	-	-	-	-	4
In the inguinal glands,	-	-	-	-	3
In the cellular tissue under the pleura,	-	-	-	-	2
In the lumbar glands,	-	-	-	-	1

In the sub-mucous tissue of the bladder,	1
In the omentum, - - - - -	1
In the parietes of the gall bladder, - -	1
In the false membranes of the pleura, -	1

Exhibiting a greater frequency of the occurrence of tubercles in the bronchial glands than in the lungs; and it is remarkable, that none of them had tubercles in the *liver*, according to either report.

35. M. Lombard in his tabular report of tubercles, in 100 adults, differs but slightly from Louis's results in similar subjects.

36. If we take into consideration that the bronchial, the mesenteric, the cervical, the inguinal, and the lumbar, are all lymphatic glands, it discovers so strong a tendency in tubercle to the absorbent apparatus in the young, as forcibly to indicate them, as the site of its *primitive development*.

37. The most impressive disclosure to me in those tables, is the small number, in both classes, in which *cervical* glands have been found tubercular, compared with the lungs and other organs. Can it be, that, of the living, pale, emaciated, puny children, amongst whom we find so many presenting those tuberculous tumors in the neck, there is an equally exceeding proportion, tuberculous in the lungs? If so, either cures, or spontaneous removals, are much more frequent than generally imagined; and "this natural scourge of the human race," when taken in time, must be much less intractable than has been supposed.

38. Tubercles are met with at all periods of existence, from that of the fœtus to that of the octogenarian. M. Lombard, physician to the Hospital des En-

fans Malades at Paris, on postmortem examination of all who died at the institution indiscriminately, discovered tubercles in one-eighth of the children, between the ages of one and two years; in two-sevenths of those who died between two and three years; in four-sevenths of those between three and four; and in three-fourths of those who died between four and five years of age.

From the period of birth up to the fifteenth year, according to the same author, from one to two is the age at which fewest tubercles are found; between four and five, that at which they are most common and affect the greatest number of organs. After puberty tubercles again become more frequent; but are more restricted in locality to the lungs and intestines, in the period of life extending from fifteen to forty-five. From nineteen to thirty-five is reckoned the most dangerous period of life for adult males—from sixteen to twenty-five for females.

39. *Tubercles in inferior animals.* The tuberculous degeneration is not peculiar to man; tubercles have been found in nearly every description of animals, beasts, birds, reptiles and insects, carnivorous, and herbivorous. Cuvier's researches led him to the conclusion, that the carnivorous were least subject to the complaint. Andral informs us that within his knowledge, genuine tubercles have never been discovered in the canine species.

CHAPTER II.

PATHOLOGY OF TUBERCLES.

SEC. 40. *Source of tubercle.* The most striking characteristic in the pathology of tubercles, is, their extraordinary dissemination. Their indiscriminate development in all classes of animals, and in each of the various and very dissimilar tissues and organs, marks the disease to be of the nutritive function, and its cause degeneration of the blood—the only function and source sufficiently general and operative for the production of a uniform morbid result, pervading every part of the body, and common to the whole animal creation.

41. This pathological induction from natural history has been abundantly affirmed by post mortem examination. We find Laennec* ascribing tuberculous formations to “aberration of nutrition”; Stokes,† to “lesion of the blood”; Andral,‡ to “modification of the whole perspiratory secretion”; Louis|| conceives “that exhalation (from the blood) is one of the most frequent means employed by nature for the production of tuberculous matter”; Gross§ deems it the result of “depositions of coagulating lymph, produced by inflammatory action”; Carswell¶ says, it “is separated from the

* Laennec on Diseases of the Chest.

† Stokes on Diseases of the Chest.

‡ Andral's Morbid Anatomy.

|| Louis on Phthisis.

§ Gross' Pathological Anatomy.

¶ Carswell on Tubercle, (Cyclopedia of Practical Medicine.)

blood after the manner of secretion"; he regards "the mucous and serous surfaces, and the blood, as the exclusive seats of the tuberculous matter"; Sir James Clark* concurs with Dr. Carswell; Gerhard,† alluding to the incipency, says, "The disease of the lungs scarcely preponderates over that of the rest of the body, and the seat of the disorder is to be looked for in the fluids, rather than the solid tissues."

42. Thus we have the opinions of the most eminent men who have investigated the subject; derived from the most indefatigable and philosophical researches in pathology; from results and developments brought to light by researches prosecuted in different countries and under various circumstances; all concurrent as to the important question of *source*; and all, in one form or another, referring this to the blood, however they may differ in other particulars.

43. *The blood.* The blood being established as the source, it would seem to me, that the next most important means of elucidating the pathology of the disease, would consist in the analytical examination of the blood of tuberculous persons, and the comparison of it with that of the healthy and of those who labor under other diseases of analogous diathesis.

44. Next; as a measure important to treatment, we should compare tuberculous blood with the blood of persons who labor under diseases of an *extreme opposite diathesis*. For, if in those diseases the bodily symptoms of which deviate in opposite directions from the

* Clark on Pulmonary Consumption.

† Gerhard on the Chest.

healthy condition, the blood is found to deviate in like manner adversely, the inference would seem to follow, that they must arise from adverse causes, and that they demand opposite modes of treatment. It would seem at least worthy of consideration, whether such treatment or regimen as would cause the one, might not tend to remove, or to change the character of the other.

45. Analysis of the blood of the consumptive has been wonderfully neglected, considering that it is the admitted source of so momentous a disease. But, as far as observed, its changes are very strictly in accordance with the personal indications and symptoms of the disease. We find the blood as meagre, pale, serous and deficient in red globules, as is the person emaciated, weak, and deficient in complexion. In blood of the consumptive, I have found the serum unusually viscid, and, sometimes, in the proportion of more than 5 to 1 to the crassamentum. In such blood I have seen the surface of the clot dotted all over with numerous small, white specks of solid matter, that I believed to be tuberculous.

46. My observations, for more than twenty years, have been directed, in a very especial degree, to the manifestations of the blood in different diseases; but more particularly in phthisis and those diseases which I regarded as analogous, as well as those which I considered of antipodal diathesis. But my examinations were principally without chemical agency, and were restricted to observation of animal principles. Similar examinations have, within a few years past, been made in Europe, on a more extensive scale and under more favorable circumstances; but, singularly enough, they, too, are deficient in the same important principles as

my own, having been mostly restricted to animal principles.

47. Many of these examinations have been conducted by the ablest pathologists of Europe: men whose authority will inspire more confidence in the minds of my readers than could the details of any of my own observations. I shall therefore in the investigation of the matter, assume, generally, the attitude of endorser, instead of that of drawer. Most of the analyses which I have quoted that were not previously familiar to me, have been repeated; and I may be considered as vouching for them unless it is otherwise stated.

48. None of the many investigations which I have examined, as before remarked, has especial reference to *phthisis*, a disease the origin of which is, of all others, the best established as dependent on the condition of the blood, and as the most frequent and the most destructive in the catalogue of maladies. All I have met with on this head, has been incidental, and seems to have occurred, in the course of the investigation of other diseases. This certainly constitutes no objection to the results; indeed, it is rather favorable to them, as it carries with it the assurance, that the observer may be considered unbiased by preconceptions: but these investigations have been less thorough than the occasion requires, having been restricted to the notice of the *animal* principles, totally regardless of the *saline* and other *mineral* properties which we have reason to believe are equally important, and a knowledge of the proportions of which, in relation to the healthy standard, is even of greater practical importance, because over them we have more power, and we better understand the manner of controlling them.

49. *Analysis of Blood.* In health, blood, when coagulated, presents the appearance of a little more crassamentum than serum; though this varies somewhat in different individuals who manifest no actual deviation from health: that of the most athletic presenting the greater proportion of crassamentum, and being of deeper color; that of the more delicately constituted most abounding in serum, and being of paler color.

50. The crassamentum is composed of two parts, the red globules and the fibrin. The serum is composed of albumen, water, and saline matters.

51. The relative quantities of those constituents are extremely variable: each variation, doubtless, indicating a relative morbid condition, but often too minute to be perceptible: hence the difficulty of settling upon a standard for the composition of healthy blood. The difficulty consists in finding a perfectly healthy subject. Mr. Abernethy, in reference to this difficulty, we are told, once said to his class, "He is not to be found in the city of London."

52. The relative healthy proportions of fibrin, the excess of which indicates inflammatory action, and which is invariably in abnormal proportion in phthisis, is, for example, thus variously estimated by different eminent physiologists:

By Lecanu at three parts per thousand; by Berzelius at less than one per thousand; by Fourcroy, varying from one to four; by Davy, one and a half; by Nasse, three and a half; by Muller at five; by MM. Andral and Gavarrett at three.

53. As a standard is necessary by which to estimate the value and tendency of morbid changes in the constituent principles of the blood, the following, which

is something like an average of the estimations of the best authorities, may answer the purpose:

In 1000 parts, the dry coagulum is composed of,

Fibrin, -	-	-	-	-	-	-	3
Globules, -	-	-	-	-	-	-	127*

The serum is composed of,

Albumen, -	-	-	-	-	-	-	68
Saline matters, -	-	-	-	-	-	-	12
Water, -	-	-	-	-	-	-	790
							1000

54. M. Lecanu has observed that the proportion of water, in human blood, varies from 853 to 778 in 1000 parts; and the solid particles from 148 to 68; that in men the blood contains a larger proportion of solid matter than in women:

The blood of men averaging,	solid matter,	-	132
“ “ “	water,	-	805
“ women “	solid matter,	-	99
“ “ “	water,	-	821

the quantity of albumen not differing in the two sexes. He found the richness of the blood also varying, according to the temperament of the individuals:

Men—sanguine temperament,	solid particles,	-	136
“ “ “	water,	-	786
“ lymphatic “	solid particles,	-	116
“ “ “	water,	-	800
Women—sanguine temperament,	solid particles,	126	
“ “ “	water,	-	793
“ lymphatic “	solid particles,	117	
“ “ “	water,	-	802

* Two parts of the globules are constituted of hæmatine (red ferruginous matter), forming a vesicle which encloses *solid albumen*, to the amount of the other 125 parts.

55. *Antipodes Diatheses.* Those opposite conditions—the extreme deviations on either side of the healthy medium—for the sake of perspicuity in illustration, we will distinguish as the *globulous*, and the *serous, diatheses*.

56. *The Globulous.* The globules constitute the richest principle of the blood, and persons who abound in them, are distinguishable by ample and well proportioned chests; thick, rough skin; firm muscles, (commonly large;) superior strength, and intrepid dispositions; and, generally, by dark complexion and hair. In morbid action, their diseases incline to be acute.

57. *Serous.* The serous blooded have slender and badly proportioned chests; thin, smooth skin; slender and relaxed muscles; inferior strength; mild and amiable dispositions; and, generally, fair complexions and light hair. In morbid action, their diseases incline to be chronic.

Let us now compare the chief morbid changes incident to those opposite diatheses, and reflect on the effect which might result from inducing a change from the one to, or, towards the other.

58. *Morbid Conditions.* The globulous diathesis is most subject to arthritic and acute disorders. Diseases in persons of this diathesis, are violent and rapid; requiring free depletion and decidedly anti-phlogistic and diluent treatment. Their most prominent disorders are gout and apoplexy; and when extending to atrophy are most liable to eventuate in *scurvy*.

59. *Gout.* I am not in possession of an analysis of gouty blood, except with regard to its proportion of fibrin—the indicator of local inflammation. This, in

acute gout, has been found moderately in excess, as from 4 to 6. The blood, in this disease, is of deep crimson color, seldom buffed; and, on coagulation, presents an excess of crassamentum and deficiency of serum.

60. *Apoplexy*. In the kindred disease, *apoplexy*, which belongs both to the same temperament and diathesis, M. Andral furnishes more precise and more satisfactory analysis. In seven cases of cerebral hæmorrhage there was diminution of fibrine and augmentation of globules. "In one of them, the proportion of fibrine had fallen to 1.9, while that of the globules had risen as high as 175. A few days afterwards, the symptoms were more favorable, and a second venesection was practised;" fibrine was now 3, globules 137.*

61. *Scurvy*. This disease may be considered the atrophy, the extreme of the globulous diathesis; and the direct morbid antipode to phthisis. Residing remote from the sea-coast, I have had but little opportunity of examining the blood of scorbutics. Several authorities, however, concur in representing the arthritic, the plethoric, and the melancholic, to be most prone to it. Free livers, of plethoric habit, and ruby countenance, I have frequently found to be subject to hæmorrhage from the gums, fauces and nares; and sometimes to ecchymosis of the surface. Their blood, on coagulation, presented a large, dark and soft clot, with great deficiency of serum. Eberle describes scorbutic blood as "Thick, dissolved and very dark."† "From experiments made on the blood and urine of scorbutic patients," says Thomas, "it appears that

* Andral on the changes of the blood in hæmorrhage.

† Eberle's Practice of Medicine.

three ounces of blood on cooling, consisted of two ounces of coagulum, and one of serum."* Messrs. Ettick and Allen, the surgeons of Lord Anson's expedition, inform us that such blood, after standing, becomes thick, dark and muddy, with greenish shades on the surface, and presents no regular separation of its parts, or appearance of coagulation.† Boerhaave ascribes the disease to the crassamentum of the blood becoming inordinately thick and viscid, and the serous portion too thin, salt, and acrid.‡ "In cases" (of scurvy,) says Monde, "where the coagulum is unusually soft, experimenters have discovered an abnormal proportion of the globules."|| "M. Magendi," says Andral, "by withdrawing a portion of the fibrine from the blood of animals, induced in them various congestions and hæmorrhages. M. Gavarret and I, have ascertained, that the blood of scorbutic patients, whose skin was covered with large ecchymoses, had not more than a third part of the normal quantity of fibrine; and we have proved that the tendency to hæmorrhages is just in proportion to the amount of the deficiency of this element in the blood."§

62. *Serous Diathesis.* Diseases in persons of serous diathesis, incline to the chronic, are insidious in their progress, and generally demand tonic and stimulant treatment. The most prominent diseases in this class, are dropsy, chlorosis, and tubercular consumption.

63. *Analysis of Blood in Consumption.* The blood of the tuberculous—the extreme morbid condition

* Thomas' Practice.

† Cyclopedia of Anat. and Physiol. By R. B. Todd.

‡ Do.

|| Monde on the Pathology of the Blood.

§ Andral's Epistle to Professor Forget.

of the serous diathesis—is found to differ in every characteristic, as widely from that of the apoplectic and the scorbutic, as do the subjects of each class in aspect, complexion, and in personal conformation. The blood of the tuberculous, on coagulation, presents a small, pale, firm clot, floating in an excessive proportion of serum. The researches of M. M. Andral and Gavarret,* show, that, in phthisis, the fibrine is always abnormally increased, while the globules are as constantly diminished; and those disproportions keep pace with the progress and intensity of the disease. “In phthisis,” says M. Monuret,† “when tubercles are still crude, the *increase* of *fibrine* is scarcely appreciable; when they begin to soften, it is more marked; and at length when vomica are formed, the proportion of this element sometimes rises to 6 parts in the 1000. The *red globules*, on the other hand, follow the very opposite direction: their *decrease* is progressive from the commencement to the close of the disease; the difference often exceeds twenty parts.” In addition to all this, we have abundant evidence that persons predisposed, or of tuberculous diathesis, are deficient in globules, not only in the progress of phthisis, but prior to its onset, as indicated by their waxy aspect, and the pale color of their blood.

64. *Chlorosis*. In this disease, which, if not cured, pretty uniformly eventuates in phthisis, the greatest deficiency in globules occurs, which has been remarked as incident to the blood, and sometimes without alteration, or, even with diminution in the proportion of fibrine, although these principles generally change in-

* M. M. Andral and Gavarret on Humorism.

† Monuret on Alterations of the Blood in different diseases.

versely. M. Andral has seen a perfect buff, with the fibrine a little less than natural, on the blood of a chlorotic girl, in which the globules had fallen to 28.* Here was blood almost exclusively serous.

65. *Dropsy*, like consumption, is of serous origin; but this is the result of a degeneration on error loci, of one constituent of the serum; whilst tubercular phthisis, is of the other: the one the result of an *aqueous*, the other of an *albuminous* "exhalation:" the one producing an aqueous swelling, the other eventuating in the formation of albuminous tumors, (tubercles.) My reference to dropsical effusion, will be restricted here to the illustration of the tubercular deposits and the albuminous degeneration.

66. In several pathological respects, we find those degenerations, if not analagous, at least, remarkably coincident.

1st. They coincide in source.

2d. In locality; being liable to be deposited in all the tissues of the body, and common to all animals; and in being deposited, almost always, in the interstitial cellular tissues.

3d. The morbid products of both are of questionable organization.

67. *Analysis of Tubercle*. Tubercle, according to analysis by M. Thenard, in its unsoftened state, in 100 parts, contains,

Animal matter, (albuminous chiefly,)	98.15
Muriate of soda, }	1.85
Phosphate of lime, }	
Carbonate of lime, }	
Iron, - - - - -	a trace.

* Clinical Lecture on Fever and Inflammation.

68. *Analysis of Serum.* The component parts of serum, according to Dr. Marcet, are, in 1000 parts,

Water,	-	-	-	-	900.00
Albumen,	-	-	-	-	86.00
Muriates of potash and soda,	-				6.60
Mucous extractive matter,	-	-			4.00
Sub carbonate of soda,	-		-		1.65
Sulphate of potash,	-	-	-		0.35
Earthy phosphates,			-	-	0.60

69. If deprived of its 900 parts water of solution, there remains 86.80 per cent. albumen; 9.20 of saline matter, differing from the composition of tubercle not more essentially than different specimens of blood or of serum often do from each other.

70. *Serous origin of Tubercle.* Without resort to creative agency, we have no other source in nature for those albuminous tubercles but the *serum*, the *lymph excepted*, which will be hereafter noticed as being of the same general character.

71. Variations in the proportions of serum are of as common occurrence as in the other constituents of the blood. The following are the greatest extremes that have been recorded:

Fibrine varies from	-	1 to 10,	in 1000
Globules,	-	185 to 27,	“
Albumen, of the serum,		104 to 57,	“
Water,	-	915 to 725,	“

72. But the fibrine is recognised as chemically identical with albumen of the serum;* and 125 parts of the 127 of the globules, are of solid albumen, which is merely invested by capsules of haematine (53;) ma-

* Monde and Andral.

king the actual, much greater than the apparent, proportion of albumen, and reducing the constituents of the blood almost exclusively to *albumen, water, and mineral ingredients.*

73. Either of those principles may be in excess; and the disproportion of one, may produce an unnatural condition, or *separation*, of another; somewhat as in the ordinary action of chemical affinity, the abstraction or the excess of one element may cause the separation of another, or otherwise greatly modify the properties of the compound.

74. It is, for example, so well established as to be generally admitted as a pathological fact, that excess of saline matter in the blood, sometimes so changes its character as to cause excessive absorption and ulceration of the tissues of the body, (scurvy;) and on account of observations hereafter stated, I consider it highly probable that *deficiency of saline and ferruginous matter, may be no unfrequent proximate cause of albuminous deposits in the tissues.*

75. *Dropsical* effusion rarely, if ever, consists of water alone; but is generally in combination with a fluid, susceptible of coagulation, which is often found to be manifestly albumen.

76. Either of these deposits, the aqueous or the albuminous, jointly or separately, and either in form of dropsy or tubercle; may occur without appreciable disorder of any of the tissues or organs of the body. Dropsy especially, experimentalists have found, may be produced in healthy animals simply by gradually and perseveringly injecting water into their veins. The surcharge presently comes to be deposited in the tissues of the body, until a general dropsy results.

Local dropsies occasionally occur, the absorption of which is accomplished without the concomitant establishment of proportionate excretion to eliminate the fluid. In consequence of this, the retained fluid comes to be deposited again, in another part of the body. "It sometimes happens," says Andral,* "that the fluid which disappears from one cavity, almost immediately accumulates in another, where its presence is accompanied by a new train of morbid symptoms."

77. As with water, so also with albumen. When the blood is surcharged with the latter, we have an albuminous, instead of an aqueous, exhalation, infiltration, or secretion, (for it matters not which to the parallel in question,) into the interstitial cellular tissues; which is subject to the same laws, and liable, like the aqueous, to be absorbed and eliminated; or, if absorbed and retained, liable to be transported to, and deposited again, in some other part of the body. Examples of which are given. (86-189.) Or if either deposition be retained until putrefaction and decomposition commences, it becomes alike productive of hectic fever, with all the concomitant symptoms.

78. "The serum, in respect to its composition," says Andral, "presents several varieties that we must not confound: 1st, it may contain at the same time much water and much albumen; 2d, the latter principle may predominate, the quantity of water remaining the same, or even being diminished; 3d, the reverse may take place, and the serum be composed of much water and little albumen. Whatever be the composition of the serum, it is sometimes found in small quantity in proportion to the coagulum, and sometimes

* Andral's Morbid Anatomy.

the reverse is the case. All these differences should be noted, as corresponding to so many particular morbid states. It is worth while remarking, in many of these cases, how very just are the common expressions of *impoverished blood, watery blood, blood turned into water,*" &c.

79. And again: "In times of scarcity, the whole population of a country has been known to be reduced to have recourse to the herbs of the field for support, and to live more or less exclusively upon that sustenance. Now, in such cases, there has been always observed to appear, in consequence of such diet, the same morbid state, namely, dropsy: as if in proportion as the blood became poorer and more deficient in fibrine, and approached nearer to pure serum, it *escaped* the more easily from the *vessels*, and *accumulated* either in the *cellular tissue*, or in the different serous cavities."*

80. When it is taken into consideration that the albumen as it exists in the blood, is equally fluid with the water, and that when those constituents are in the compound state and condition of serum, they constitute a homogeneous fluid, separable only by chemical agency or organic action; why should not this reasoning of Andral on the developement of dropsy, apply equally to that of tubercle? If, instead of water, the quality of food had been adapted to the degeneration and augmentation of albumen, why should not albumen "escape from the vessels and accumulate in the cellular tissue?" To me, there seems no difference, but in the result—albumen instead of water—tubercle instead of

* Andral's Morbid Anatomy.

dropsy. Without change of source, change of process, violation of function, or creation of material.

81. If both escape together, the water being most easily absorbed, might leave the albuminous portion of the deposit solid, and in the very condition in which we actually find mature tubercle—the state of solid albuminous matter. The appearance frequently observed of tubercle on its recent deposition, indicates this very process. Gerhard, speaking of tuberculous infiltration, says: “In other cases the tissue affected is infiltrated with a grayish semi-transparent liquid, which does not at first reveal its peculiar structure; little by little this disappears, and is gradually absorbed as the quantity of the new substance increases.”* This is the “gelatiniform tuberculous infiltration” of Laennec,† &c., who recognise it in many cases, as the primitive state of tuberculous formations. (8.) Tuberculous nuclei being thus formed, the manner of their growth or aggregation is referable to ordinary laws of affinity; by which particles attract and approximate others that are similar and related to themselves. “Eleven days after tapping a young woman,” says Dr. Babington, “in whom ascites had supervened upon rheumatic affection of the heart, she was found to be filling again very fast. A few ounces of blood were taken from the arm, and this blood was found to contain 0.319 per cent. of fibrine, and only 3.57 per cent. of albumen.” This, then, must have been essentially an albuminous effusion—the albumen being exhausted from 68, the healthy standard, to 3.57. In albuminaria, the albumen is found constantly more

* Gerhard on the Chest.

† Laennec on Diseases of the Chest.

or less reduced in consequence of its renal excretion; but never perhaps in any case to such a degree as this. In ascites many cases are on medical record in which, instead of an aqueous, there was an albuminous accumulation; sometimes even too thick to be discharged by the ordinary trocar canula. I have myself encountered two such cases, and in several others have found the fluid of a consistency nearly as viscid as the albumen of the egg.* In some cases I have found it thinner than this, and in a fœtid, putrefactive condition, but albuminous and containing curdy or flocculent matter, very much resembling the tuberculous expectoration. In all these cases the patient had hectic fever.

82. *Lymphatic Origin of Tubercle.* Although serous infiltration, I doubt not, is a very frequent cause of tuberculous formations, yet there are manifestations which indicate that this is not the only source or manner of their production. Tubercles in their location incline to the lungs—the centre of the circulating system. The exhalents, the organs of the serous exudation, are more essentially the apparatus of its periphery, pertaining to the cuticular and free serous and mucous surfaces. The course of the lymph which flows from every part of the body to the lungs, furnishes us from hence a ready solution of the phenomenon of *tubercular phthisis: and the serum and the lymph* are the only sources from which matter of the nature and character of tubercle can be derived, without resort to *ultimate elements* for its formation:

* This may have been in a greater or less degree gelatinous; it was not tested.

certainly a most unnecessary extension of research, when we have at hand *identical proximate principles*.

83. *Analysis of Lymph.* According to Mr. Chevreuil the composition of lymph, in 1000 parts, is as follows:

Water,	-	-	-	-	926.4
Fibrine,	-	-	-	-	4.2
Albumen,	-	-	-	-	61.0
Muriate of soda,	-	-	-	-	6.1
Carbonate of soda,	-	-	-	-	1.8
Phosphate of lime,	}	-	-	-	0.5
Phosphate of magnesia,					
Carbonate of lime,					

84. This analysis, deducting the water and fibrine,* leaves, of albumen, about 87.6 per cent. Compare this, as below, with the analysis of tubercle and of serum heretofore given:

<i>Lymph.</i>					
Albumen,	-	-	-	-	87.6
Saline matter,	-	-	-	-	12.4
<i>Tubercle.</i>					
Albumen,	-	-	-	-	98.15
Saline matter,	-	-	-	-	1.85
<i>Serum.</i>					
Albumen,	-	-	-	-	86.80
Saline matter,	-	-	-	-	13.20

85. Hence we may have tubercle *ready made*, simply by extravasation and coagulation. And *lymph* is capable of *spontaneous coagulation*; which process *may* be liable to occur within its vessels, as we know sometimes happens with the blood.

* Dr. Hecht, of Strasburg, gives fibrine as a constituent of tubercle. (See Gross' Pathological Anatomy.)

86. "It is not very uncommon," says M. Andral, "to find the mucous follicles filled with a substance which has exactly the aspect of tuberculous matter; and I have more than once found the same substance in the lymphatic vessels, which then appeared under the form of whitish knotted cords; some of them proceeding from organs containing tubercles; others from parts which were free from that affection, but were in a state of acute or chronic irritation, or else presented no appearance whatever of disease. For instance, I have often seen lymphatics full of a whitish matter, like that of tubercle proceeding from intestinal ulcerations, and losing themselves in the mesentery, while no where else in the intestine were traces of this matter to be found. A woman died at *La Charete* of a cancer of the uterus, in August, 1824. On opening the body, it was found that the mesenteric ganglions, and those of the hollow of the pelvis, formed hard white masses, of great size in front of the vertebral column. The inguinal and bronchial ganglions presented the same alteration; and from several of the former proceeded vessels distended with a limpid colorless, serosity, which presented at intervals, white points, capable of being displaced by a slight pressure. It appears then, that the matter, which formed these white points, was contained in the calibre, not in the parietes of the vessels; and in fact on making a slight incision, it escaped freely, by the sole action of their elasticity. It was of a dull, white color, and of a moderate consistency, readily breaking down under the finger; it was in short genuine tuberculous matter. Some of the lymphatics thus distended by it at intervals, could be easily followed under the crural arch,

and into the pelvis, to the middle of the mass of diseased ganglions, in front of the spine. The thoracic duct disengaged itself from this mass opposite the last dorsal vertebra; and was, in three or four places, greatly distended, and in a manner obstructed by the same whitish substance already described, which here formed masses, one of which was as large as a nut; and which were also evidently contained in the calibre of the tube, without having any connexion with its tissue. The external surface of both lungs, was traversed by a great number of white striæ, exactly similar in their disposition to lymphatic vessels injected with mercury. These striæ were really lymphatics distended with a matter analogous to that contained in the other, and in the duct. It was easy to follow some of them into the bronchial ganglions, which were themselves transformed into hard, white masses. The interior of the lungs, especially the left, likewise contained several of these vessels, appearing like white thread and distended at intervals. In some spots they were isolated; in others more or less crowded, forming a kind of plexus. Nothing resembling tubercle was to be found in any part of the lungs. Neither the parietes of the different vessels in which the whitish substance occurred, nor those of the thoracic duct, presented any appreciable alteration. I shall not attempt to decide whether this tuberculous looking matter was formed in the vessels in which it was found, or was introduced by absorption. I shall only remark that if the blood has the power of coagulating in its vessels, and of assuming therein different appearances, even to the extent of becoming transformed into the substance called *encephaloid*, or into

pus, it is not surprising that the serous fluid of the lymphatics should also possess the power of spontaneously becoming solid within them; and having once passed into this state of undergoing those same alterations, of which observation has ascertained the possibility in the case of the blood.”*

87. Those observations are as strong as if Andral had been looking here for the primitive formation and seat of tubercle. Yet both before and after this, in the same chapter, he expressly refers to lesion of the perspiratory secretion as the origin of tuberculous matter. For this very reason the relation becomes the more valuable, as being made thereby clear of all suspicion of bias by preconceptions, either in examination or in detail.

88. Lymph, too, is constituted of the solution of the disorganized tissues of the body, which is on its way to the lungs to undergo the process of reassimilation. This may, in some measure, account for the heterogeneous character, and for the doubtful organization of tubercles; for, if coagulated, or converted into tubercle, prior to admixture with the blood—without reassimilation—it probably would not be susceptible of any other than a very imperfect degree of organization, if organizable at all. In various cases of phthisis, there appears to be a wide difference in this particular. In some, tubercles are rapidly formed, and become softened and decomposed as rapidly as produced. In others, they seem to be indued with almost as much anti-septic capacity as natural tissues; maintaining their integrity for years.

*Andral's Morbid Anatomy.

89. Physiologically considered, tuberculous degeneration would seem more liable to originate in modification of the lymph than of the serum; especially when the disease happens in consequence of disturbances, in the nutritive, or in the excretory functions. In healthy action, an exact equivalent of nutriment is absorbed from food, to that which is deposited to supply waste in the tissues of the body, and the worn out and decomposed parts are all eliminated from the system, by the excretory organs; but in case of disease or of deficiency of food, there is liability to retain matter, that in healthy equilibrium, would have been ejected: and if the privation is great, inasmuch as a certain quantity of blood is necessary to prevent collapse of the vessels, the solids of the body become, in such cases, rapidly absorbed, and converted into circulating fluid.

90. "There seems to be," says Mr. Hunter, "a sympathetic influence, between the solid and the fluid parts of an animal, designed by nature for their mutual support. In disease, when the machine cannot be furnished in the usual way, the solids of the body supply the defects; and the person becomes lean; and the fluids would appear from this to be more an object of attention in the machine than even the solids."*

91. The supply thus derived, we see, (83) must be essentially serous; totally deficient in red globules—the principle, the deficiency in which especially characterizes the tuberculous blood. It is also liable to be charged with debris, acid carbon, &c.

Such degeneration may also occur from interrup-

*Hunter on the blood.

tions of excretion; where health is not obviously impaired, and independently of abstinence. Portions of those disorganized tissues, the solution of which constitutes the lymph, we find, are in health, destined for *excretion*. Suspension of the excretory process, especially of the perspiratory, may cause their retention, until the vessels become so filled that the chyle comes to be excluded by this lymphatic preoccupation. Observations lead me to believe, that cases which are termed, acute, phthisis, or galloping consumption, commonly originate in this way.*

92. On comparison of the analyses of serum and tubercle, the deficiency of saline matter in tubercle is striking (84.) The analysis we presume was of the serum of a healthy individual. Does such deficiency in saline matter, as occurs in tubercle, exist in the blood of the consumptive? If so—this in connexion with the fact that salt sea-diet produces scurvy, a disease of morbid absorption, under the influence of which *phthisis*, a disease of morbid deposition and of an opposite diathesis, yields;—would afford a new, and an exceedingly important pathological fact.

93. It has heretofore been demonstrated that the gouty, the apoplectic, and the scorbutic, have blood that has more red globules and is of deeper crimson than that of the healthy. And that the blood of the tuberculous, on the other hand, is thinner, more serous,

*From effects of this description arising from great exposure to inclement weather, I have met with cases of general anasarca, occurring suddenly in athletic individuals, swelling them enormously all over the body, in the course of a few days, from the onset: The disease has in some of these cases subsided again quite as rapidly, under resort to blood-letting and digitalis.

and paler. If, in addition to this, we could come to the certain knowledge, that those other differences do exist, which pathological observations seem to indicate; that, in the globulous diathesis, the blood is excessively saline and ferruginous, while in the serous diathesis, the blood is as constantly deficient in those mineral constituents, as in globules and in hæmatine; if we could only know this or the reverse; if we only had the truth and light which I presume chemistry is capable of shedding on the subject; we should then be able to adapt treatment to phthisis with greater precision, by directing our efforts to a more comprehensible object.

94. Some chemists to whom I have proposed this investigation, represent it as requiring a difficult and nice process; and they appeared not emulous of the honor. My sense of taste indicates the globulous and high colored blood, to be decidedly the most saline of the two. And my own unskilful essays at analysis, have exhibited in tuberculous blood, decided deficiency in mineral matters; but the manipulations were not nice enough accurately to separate and distinguish them.

95. I have no where met with a thorough analysis of tuberculous blood; and only two, of the blood of persons affected with chlorosis, a diseased condition, which I consider to be decidedly of a kindred diathesis; and which we find constantly eventuating in phthisis, if not cured. Dr. Jenkins, in two cases of chlorosis, one in a girl of 15, the other 21, found that the blood contained, of water, 871, and 852, respectively, to the 1000, instead of 780, the healthy standard; and of coloring matter, 48.7, and 52, instead of 133; albumen and salts about in the usual proportions.

96. Dr. Babington gives Dr. Stephens the credit of having directed attention to the fact that the saline matter in the blood gradually disappears in the progress of fever; which has been confirmed by Dr. Jennings, who found the alkaline salts diminished in the following proportions:

In healthy serum, according to Lecanu, salts, 8.10.

In the serum of a male, aged 31, first* day after fever, salts, 4.

In the serum of a male, aged 34, first day after fever, salts, 5.

In the serum of a female, aged 14, fourth day after fever, salts, 4.2.

Average of three other cases, 4.4.

97. This would have been more to the purpose in furtherance of *my* researches, if the character of the fever had been stated. The accompanying fact stated, that Dr. Stephens found saline matter "almost entirely lost in the last stage" of fever, would seem to rank the deficiency as an *atonic* indication. In connexion with this, it is worthy of remark, that protracted fevers are frequently succeeded by tubercles in the neck, especially in children that we should recognize to be of the serous or scrofulous diathesis; and, as they convalesce, these tubercles gradually diminish, and, on the return of the ruby complexion of health and of restored hæmatine, they entirely disappear. What lesion of the blood caused this deposition? What changes in convalescence caused their removal? Admixture of salt with the blood is known to prevent its

* This early period would indicate the saline deficiency, in character of a cause, rather than an effect.

coagulation.* Why should not, on the other hand, deficiency of this ingredient conduce to coagulation?

98. With the return of health the blood may be presumed to reacquire its mineral constituents, saline as well as ferruginous. The latter acquisition is exhibited in the ruby complexion. And tuberculous persons, in long sea voyages, such as are conducive to scurvy, a condition in which the blood is, notoriously, excessively saline—have their tubercles absorbed and their consumptions cured. (Chap. vi—Art. Salt.)

99. In a series of experiments on albumen, tubercles, &c., with alkalis and neutral salts, I ascertained that admixture of those retard or prevent the coagulation of albumen, and promote the solution of tubercle. (260.)

100. *Organization of Tubercle.*—The organization of tubercle, remains one of the vexed questions in the pathology of phthisis. Some of the best authorities, forming a majority of the most eminent and minute pathological anatomists of the age having been unable to detect any organic apparatus, have in consequence, come to the conclusion that none exists.

101. On the other hand some of the opposite few,† have been able to rebut this negative, with positive evidence of organization; “within the last two years,” says Professor Gross,‡ “I have examined not less than six specimens of organized tubercles, one occurring in the kidneys, two in the spleen, one in the peritorænum and two in the lungs; they were taken mostly from children, under twelve months of age. The tubercles

* Cyclopedia of Anatomy and Physiology.

†Laennec. Barron. Gross.

‡Gross' Pathological Anatomy.

were of the milliary kind, and numerous vessels, loaded with florid blood, could be seen shooting into them, in every possible direction, many of them penetrating a considerable distance into their substance."

102. Reviewers of the work above alluded to, I am aware, controvert this discovery, on the ground that the Professor has misconceived the vessels of cellular, or other tissue included in tuberculous aggregations, to be vessels of the tubercle.

Those acquainted with that gentleman's diligence in the prosecution of autopsical and experimental researches, would be slow to adopt such conclusions, even if other physiological and pathological evidences in confirmation were wanting. But these, independantly of ocular observation, would seem to me, as amply affirmative of the organization of tubercles in most cases, as they are of that of the albumen of the egg; of that of hydatids, of entozoa—or even of some of the natural tissues of the body, in several of which no visible arrangement of the kind has been observed.

103. If "unorganized and unorganizable." It is difficult to conceive what antiseptic property it is that preserves them during those extremely chronic cases of consumption, that extend from 4 to 5 up, according to some authorities, to as high as 40 or 50 years: During which time, they are seen, when situated visibly, often alternately to diminish and increase, or even entirely to disappear, and to appear again, or, sometimes, they never return.

"Marked," says Laennec, "by periods of increase, during which the hectic fever is manifest and emaciation makes rapid progress; and by remissions of longer or shorter duration, and sometimes so complete

that the fever, cough, and expectoration cease, and the patient recovers his flesh." In such cases what is the rationale of the process? When tubercles, if unorganized, are thus long subjected to the degree of heat and moisture incident to the animal tissues, what prevents their putrefaction? From whence is the occasional increase, and how are they diminished? and when entirely disappearing, and returning again; how, and where do they go? and what reproduces them? Can they soften and be totally absorbed and removed, so speedily as not to permit the occurrence of putrefaction? and then be as rapidly reproduced again, in consequence of a continuance of the primary diathesis? Or are they simply subject, in a modified degree to a process of more or less gradual absorption and reproduction such as occurs to fatty and other adventitious animal productions?

104. The following experiments and observations which I have made, I think clearly establish one or other of two principles in the premises: 1st. That, in some cases, tubercles have a tolerably enduring degree of vitality or organization; or, 2d, that they may be absorbed with great facility, and that their development and removal, deposition and absorption, are common occurrences. *Experiment.* Tubercles, in their various stages of development, from incipiency to maturity, some that were dissected out of the lung, and others, in, and along with the portion of lung that contained them, were, on the 26th of June last, put into vials well corked; some, alone; others with water; others with salt and water; in another vial was put the albumen of an egg: salt was added at the rate of about 8 per cent. to the water; an approximation to

the saline combination in healthy serum. A tolerably well defined degree of decomposition occurred in all of those preparations in the course of a single month, in a temperature about 1-5 lower than that in the human tissues. Now if there is no vital connexion between those tissues and the contained tubercles, there should be no antiseptic difference between them and those in vials, but that which would arise from the relative heat and moisture of the two situations; and both of those are adverse to the locality in the tissues.

Other experiments varied in the details made upon tubercles from other subjects, and upon albumen coagulated; all eventuated to nearly the same import.

The results are exhibited in the subjoined table.

1842. Dates. Put in vials June 26.	Clean tubercles.	Tubercles with water.	Tubercles with salt and water.	Tubercles in the lung.	Tubercles in the lung, with water.	Tubercles in the lung, with salt and water.	Albumen of the egg.
July 1	Moulded.	Moulded.	Have become clean, and look more solid.	Moulded.	Moulded.	Cleaner and more compact.	-
" 3	-	-	-	-	-	-	-
" 9	-	-	Turbid.	-	-	-	Putrid.
" 10	Dissolved.	-	Reduced to curdy fragments, white, odor of sulphuretted hydrogen.	Soft tubercles not perceptible to sight or touch, odor putrid.	Dissolved, Nothing left but turbid fluid, con- taining hairy looking par- ticles, odor putrid.	Lung sound, tubercles white and sound, about the consistency of curds odor of sulphuretted hydrogen.	-
" 11	Brown.	Putrid fragments brown and flocculent.	-	-	-	-	-
" 13	Slime quite putrid.	-	-	-	-	-	-
" 16	Soft. Homogen- eous brown mass.	Muddy, gray fluid, containing brown flocculent matter.	Milky fluid, containing minute white particles.	Homogene- ous putrid mass.	Dirty fluid.	No tuberculous mat- ter perceptible, lung sound.	-
" 20	-	-	Milky fluid, white par- ticles still smaller, when washed they resemble pus.	-	-	Lung still sound, on dissection 2 sound tu- bercles found in the in- terior the size of millet seed.	-

CHAPTER III.

CURABILITY OF CONSUMPTION.

105. Modern pathologists generally concur in dividing phthisis into two stages, with reference to the most marked changes that occur in the progress of the disease; the first extending from the incipient formation of tubercles to their maturity; the second from thence to the termination of the disease, embracing the periods of softening and expectoration of tubercles and ulcerations of the lungs.

106. Until within little more than a quarter of a century, the idea of curing consumption, after the lungs had become extensively ulcerated and excavated, would have been considered utterly chimerical and preposterous, not only by the community, but even by the most enlightened members of the medical profession. Previously all hope of cure referred solely to the earliest periods of the disease; and depended upon "taking it in time."

107. On the other hand, the most eminent pathologists of the present day, have come to concur in the opinion, and their observations conclusively demonstrate the fact, that pulmonary consumption most certainly is curable, even in the last—commonly considered the worst stage of the disease, after extensive ulcerations and excavations have occurred in the lungs. But, singularly enough, they are equally concurrent in the opinion, that it is curable in that stage *only*, and by no other process but that of the softening and expectoration of the tubercles.

“Whilst I admit,” says Laennec, “the incurability of consumption in the early stages, I am convinced from a great number of facts, that in some cases, the disease is curable in the latter stages; that is, after the softening of the tubercles and the formation of an ulcerous excavation.”*

108. After numerous details, and cases in point, and the full relation of ten of them, he remarks: “The foregoing observations prove, I think, that tubercles in the lungs, are not in every case a necessary and inevitable cause of death; and that a cure may take place in two different ways, after the formation of an ulcerous excavation; first by the cavity becoming invested by a new membrane—analogous to some of the textures of the healthy body; secondly by the obliteration of the excavation by means of a cicatrix.” Among the cases detailed as examples of this process of cure, we extract the following:

109. *Case.* “An English gentleman, aged 36, detained in Paris as prisoner of war, in September, 1813, had an attack of hæmoptysis, followed by a cough, at first dry, but in the course of a few weeks accompanied by purulent sputa. To these symptoms were added a well marked hectic, considerable dyspnœa, copious night sweats, emaciation and great debility. The chest sounded well every where, except under the right clavicle, and in the axilla of the same side. The hæmoptysis returned in a slight degree, now and then, and in December he had diarrhœa, which was with difficulty checked by astringents. In the beginning of January, he was so much reduced that both M. Halle

* Laennec on Diseases of the Chest.

and Bayle agreed with me in opinion, that his death might be daily looked for. On the 15th of January, during a severe fit of coughing, and after bringing up some blood, he expectorated a solid mass, of the size of a filbert, which, on examination, I found to be evidently a tubercle in the second stage, surrounded, apparently, by a portion of the pulmonary tissue, such as has been already described as impregnated with gray tubercular matter in the first stage, often met with around those bodies when large. This patient remained in the same degree of extreme emaciation and debility all January, being expected to die daily; but in the beginning of February the perspiration and diarrhœa ceased spontaneously, the expectoration sensibly diminished, and the pulse, which had been constantly as high as 120, fell to 90. In a few days the appetite returned, the patient began to move about the room, his emaciation became less, and, against the end of the month, his convalescence was evident. In the beginning of April he was perfectly recovered; and his health has continued good ever since; without even the least cough, and without his being at all particularly guarded in his climate or regimen. In 1818, this patient again consulted me for a different complaint, and I took the opportunity of examining his chest, by means of the stethoscope. The only thing I could detect, was the comparative indistinctness of respiration in the superior portion of the right lung, as low as the third rib. This part, however, sounded as well on percussion as the opposite side, and there was no pectoriloquism. From these circumstances, I am of opinion that the excavation which contained the expectorated tubercle, must have been replaced by a

cellular or fibro-cartilaginous cicatrix, and as the total absence of cough, dyspnœa, and expectoration, for so long a period, forbids the supposition of the existence of others in the lungs, I think we have a right to consider this patient perfectly cured. In 1824, this gentleman was examined at Rome, by Dr. Clark, an English physician, who practises there with great distinction, and who recognised him as the subject of the case just detailed. I saw him also the same year, and found him precisely in the same state as in 1818.*

110. The extensive experience of Laennec led him to deem such cases extremely common, and brought him to the conclusion, "that the cure of consumption where the lungs are not completely disorganised ought not to be looked upon as at all impossible, in reference either to the nature of the disease or of the organ affected. "The pulmonary tubercles," says he, "differ in no respect from those in scrofulous glands; and we know that the softening of these latter is frequently followed by a complete cure." Andral also records ten strongly marked cases in illustration of this process of cure; and since those publications, many other physicians have noticed them; until such records have come to be frequent in the medical journals. Indeed, there are now but few experienced physicians, I presume, who could not make, from their own practice, additions to the catalogue.

111. *Curability in the Earlier Stages.* When we reflect on the fit and wonderful resources of nature, we must be struck with the inconsistency of supposing that, for the removal of so very common a degenera-

* Laennec on Diseases of the Chest.

tion as tubercle, a degeneration to which at one time of life or other, we have reason to believe more than three-fourths of the human race are subject, (38,) she has no process but one that leaves the affected structures thus disorganized and mutilated!

112. Tubercle is, on all hands, admitted by the great investigators of the day, and, to my mind, demonstrated to be, in some manner or other, a deposit or secretion from the blood. But upon what grounds the antipodal function of absorption should be held inadequate to its removal, is unexplained. That the power of a function, by which the entire system with all its parts, blood, flesh, humors and tissues, morbid and natural, are made and unmade, perpetually changed, modeled and remodeled, is inadequate to remove tubercle, an animal substance deposited by a co-ordinate process, seems to me more to need affirmative than negative proof.

113. *Absorption* and *nutrition* are the antipodal and co-ordinate functions, by which the healthy condition and symmetrical proportions of the body are preserved: and, in healthy action, they are precisely balanced, so that the body neither gains nor loses. As worn out parts are taken up by the *absorbents*, a precise equivalent of the same matter is deposited from the blood in place of them, and the loss is supplied to the blood by nutriment *absorbed* from food. Thus we see that *absorption* is the beginning and the end of the whole formative process. "In considering the origin and course of the blood," says Mr. J. Hunter, "it would have been most natural to have considered absorption or the absorbing vessels; for in one point of view, they may be considered as the animal consisting of so many

mouths, every thing else depending upon them, or belonging to them.”*

114. When the absorbents are excited to excessive action, they waste the fat, attenuate the flesh, and lighten the bones. In irritative action, they take up extravasated blood, remove wens, scirrhous tumors, carious bones and particles of wood and of metals from within the tissues of the body;—the natural, the malignant, the dead, and the foreign. What sort of matter, then, can tubercle be deemed that it must be made an exception?

115. The physical properties of tubercle are very analogous to several ordinary animal matters. Chemical analysis exhibits it as almost exclusively animal matter; and very similar in composition to lymph and to serum; in fact, nearly identical, if they are deprived of their water of solution, when they become exclusively albumen, the most common constituent of the tissues of the body, matter the most bland, and the least irritating of the whole compound of fluids and solids.

116. Why then is it supposed that the absorbents are incompetent to the removal of this kindred structure? Most certainly no such conclusion can be inferred from experience and observation. We venture nothing in hazarding the assertion, than no physician can have had the experience of ten years full practice, without repeatedly having seen those tubercles which are so often observable in the neck, or other exposed parts of the body, removed without the occurrence of *ulceration*. What other process has nature for effecting this, but absorption?

* Hunter on the Blood.

117. If four-fifths of the children who die between their fourth and fifth years, have tubercles; *and the comparative proportion, of tubercles in the lungs, to those in the neck, is in living children as in the dead, viz: as 73 to 7—(34—38;)* but few can arrive at maturity without having undergone some degree of phthisis. Consequently, cures, either spontaneous or from treatment, must be in early life no very unfrequent occurrence. The following from M. Lugal is much to this purport:

118. "You know," says he, "that all, or almost all, patients who have pulmonary tubercles, are, or have been, at some time, affected with tubercles in the neck; the majority have had during infancy this external sign of scrofula, while others have had it at later periods of life. I believe that pulmonary tubercles frequently exist in early youth; but it is chiefly about the age of puberty that they are apt to be developed." "Sometimes, however," says he again, "tuberculization seems to disappear about the period of puberty, and ceasing for a number of years, it does not again develope itself perhaps until the 40th or 50th year of life."

119. We have an abundance of the highest authorities in the science of medicine, which furnish facts and cases to the same purport; some of them even going farther. Here we have distinctly presented the idea of tubercles "in early youth" that become latent, and, as it were, hibernate in the system, until "the age of puberty," an interval of from 7 to 10 years: at least the full average period of the time that those curious in the matter have fixed upon as that, within which, the whole natural body is worn out,

decomposed, removed, and renewed again, by the operation of the antagonistic functions of absorption and nutrition; and we well know that adipose and adventitious and foreign matters, are disposed of in this way more summarily than the natural tissues. How, then, are we to account for the integrity all this time of this adventitious albuminous production; constituted, as it is, of the most common animal matter in nature; matter which forms a large proportion of the natural tissues of the body, and which is more easily absorbed than any other of its constituents, the aqueous excepted; which we often see exemplified in ecchymoses? It seems to me that the tubercles in such cases unquestionably must have been removed and then reproduced; and if removed, they were for the time being *cured*; Nevertheless, the same diathesis that had originally produced them, continuing, it would be absurd to argue that it could not reproduce like results.

120. If this be true, the *permanent curability* of consumption resolves itself into the question: CAN THE TUBERCULAR DIATHESIS BE CHANGED OR REMOVED?* That, in such cases, tubercles are absorbed and removed, we have strong assurance in the consideration of their easy destructibility. For if not subject to the organic process, they must be in the nature and character of foreign matter, and subject to identically such natural processes as so much solid albumen would be in any other situation. Now, tubercles, if subjected to an equal or even to a less degree of heat and moisture, than that which is incident to the tissues

* For a full consideration of this, see chapter on prevention.

of the body, become putrid, and are perfectly decomposed, in considerably less time than a month. This I have ascertained by various experiments. (104.) Yet if not endued with vital, or, in other words, with organic resistance, the antiseptic quality manifested in the above extract, giving a durability of 8 or 10 years, surpasses that of any matter in nature, minerals excepted. But this is not all; the above extract embraces another and a much longer period, extending from puberty to the 40th or 50th year; time enough for three or four revolutions of the system.

121. Notwithstanding that every practitioner of experience has repeatedly remarked this process of the removal of scrofulous tumors of the neck, yet all who have treated of the subject are almost unanimously concurrent in opinion of the impossibility of the occurrence, preferring the high authority of Laennec, &c., to the evidence of their own senses. No one more honors the memory of this justly celebrated man than I; but I am unable, as unwilling, to enrol infallibility among his attributes. In the present instance he, in the self-same article in which he asserts "the incurability of consumption in its early stages," furnishes us important data in refutation of the position, such, for instance, as the following: "The pulmonary tubercles," says he, "differ in no respect from those found in scrofulous glands." Now these, we assuredly have repeatedly seen removed by absorption.

122. Also, among his exciting causes of consumption he adduces the transposition of tubercle among the most frequent and most powerful causes of the development of tubercles, in other parts of the body. (189.) Here, although he will not permit tubercles to

be cured by absorption, he allows the absorbents thus to take them up, and bandy them about. Why, when afloat, they might not as readily be eliminated as re-deposited, *I* know not; nor can I conceive any particular reason why tubercle, when absorbed, if unputrefied and still in the condition of sound albuminous matter, may not be returned to the circulation, re-assimilated, and again become a constituent of the blood.

123. It may be objected to the above inference, that such tumors have arisen from inflammation; but morbid anatomy instructs us, that the lymphatic glands are seldom enlarged from any other cause than tuberculous degeneration. This is so well established as to have led M. Louis, from observations through his extensive researches, to consider them pathognomonic of phthisis. If the tumor be the result of inflammation, the diagnosis is easy. The tuberculous tumor is but seldom painful; the inflammatory is always so.

124. No light of a positive and direct character can be expected on this matter from pathological anatomy, for the consolatory reasons, first, that such subjects escape the liability to post mortem examination; and second, if tuberculous tumors are removed by absorption, as no lesion of continuity occurs, no mark is left. The tubercle is absorbed; and the natural structure and condition is reinstated simultaneously; so that the pathological anatomist would find neither cicatrix nor excavation. No mutilation gives evidence that disease had ever existed in the part. But though wanting in positive, pathological anatomy is not altogether deficient in circumstantial, evidence of the absorbability of tubercle.

125. "The cure of tuberculous disease in other organs" [than the lungs,] says Dr. Carswell, "has not been so satisfactorily demonstrated. We have, however, as was before done by Dr. Jenner, and since by Dr. Barron, frequently produced tubercles in the liver of a rabbit, and afterwards ascertained that their complete removal was effected by absorption and excretion. When accomplished by the latter process, which is most commonly the case, no trace of disease remained; and when effected by absorption, the surface of the liver was found marked with irregular furrows, or depressions apparently produced by atrophy of the organ in the site of the tuberculous matter."

126. "An interesting point in the history of tubercle," says Andral, "is whether they may be absorbed while still in a state of crudity, or whether they must first be softened and transformed into abscesses before they can be removed from the lungs. This question still remains to be decided; however, the following observations may throw some light on the subject: I have been sometimes struck, when examining tuberculous lungs, with the irregular form some of the tubercles presented; at one side they retained the usual rounded form, but at the other they seemed to terminate in a sort of caudal prolongation, traversed by a deep groove. These tubercles were in the neighborhood of several large bronchia. When examining them, it struck me that they might originally have been like other tubercles of a rounded form; and that, subsequently, their central portion might have disappeared either by absorption, or by passing, molecule by molecule, into the neighboring bronchia, the consequence of which would be the approximation of the

parts not yet absorbed; and in this way might be explained the transformation of the rounded into an elongated body, and the formation of a groove in its centre. These hints are only offered to induce others to pursue the investigation.”* M. Andral also saw in some cases, crude tubercles in veins and in lymphatics, in their solid and mature tuberculous state, (86,) seemingly as if in transition from tuberculous organs to other organs.

127. Dr. Stokes† relates an impressive case of phthisis relieved and apparently cured, by the occurrence of scrofulous tumors of the neck. After relieving the lung, he effected the removal of the cervical tumors, by the local application of iodine; whereupon there was a return of phthisis; on this he discontinued the iodine, and treated the phthisis again; the tumors in the neck presently recurred, and the phthisis was again relieved.

128. In 1841, I had under treatment a case that manifested transportations very similar to the above; an outline of which is given. (Sec. 257.)

129. *Absorption of Solid Tuberculous Matter.* In all the cases above alluded to, whether of cure or transmigration of the tubercles, I presume it may be conceded that absorption must necessarily have been prior to either the elimination or transmission; but even this conceded, there is yet another question of vast practical importance, which, in the minds of many, involves even greater difficulties; it is this:—Can tubercle be absorbed prior to softening or solution?

* Andral's Morbid Anatomy.

† Stokes on Diseases of the Chest.

130. We see, as heretofore related, (86,) that solid tuberculous matter has been found both in the absorbent vessels and in the veins; but I am aware of no means by which it can be positively determined whether it was *conveyed*, or *formed*, there. But, if it is susceptible of being absorbed at all, we must suppose it amenable to the same laws which govern the process in the absorption of other matters.

131. "As we know nothing," says Mr. Hunter, "of the mode of action of the mouths of these vessels, it is impossible to form any opinion that can be relied upon; but as they are capable of absorbing substances in two different states, those of solidity and of fluidity, it is reasonable to suppose that they have different modes of action; for, although any construction of parts that is capable of absorbing a solid, may also be such as is capable of absorbing a fluid; yet, I can suppose a construction only capable of absorbing a fluid, and not at all fitted for absorbing a solid, though this is not likely; and to see the propriety of this remark more forcibly, let us only consider the mouths of different animals, and I will venture to say, that the mouths of all the different animals have not a greater variety of substances to work upon, than the absorbents have; and we may observe that with all the variety of mouths in different animals, this variety is only for the purpose of adapting them to absorb solids which admit of greater variety of form, texture, &c.; every one being capable of absorbing fluid matter which admits of no variety. The process of removal of parts of the body, either by interstitial or progressive absorption, answers very material purposes in the machine, without which

many local diseases could not be removed, and which, if allowed to remain, would destroy the person. It may be called in such cases, the natural surgeon. It is by the progressive absorption that matter, or pus, and extraneous bodies of all kinds, whether in consequence of, or producing, inflammation and suppuration, are brought to the external surface; it is by means of this that bones exfoliate, it is this operation which separates sloughs; it is the absorbents which are removing whole bones, while the arteries are supplying new ones; and although in these last cases of bones, it arises from disease; yet, it is somewhat similar to the modeling process of this system in the natural formation of bone; it is this operation that removes useless parts, as the alveolar processes, when the teeth drop out, or when they are removed by art; as also the fangs of the shedding teeth, which allows them to drop off; and it is by these means ulcers are formed.”*

132. With especial regard to absorption of tuberculous tumors, I can only allege that when situated in external visible parts, they are often removed without the exhibition of the least appearance either of ulceration or of softening. (125.) We see in the above quotation from Mr. Hunter—the highest authority on this subject, by-the-by, that ever graced the profession—that the absorbents are not only capable of taking up solids proper, but all kinds of solids, animal, vegetable and mineral.

133. And again, upon the same subject, he says, “new formed parts, or such as cannot be said to con-

* Hunter on the Blood.

stitute part of the original animal, as healed sores, calluses of bones, especially those in consequence of compound fractures, admit more readily of absorption, especially the progressive, than those parts which were originally formed; this arises, probably, from the principle of weakness, and it is from this, too, that all adventitious new matter, as tumors, are more readily absorbed than even that which is a substitute for the old. Thus we have tumors more readily absorbed than a callus of a bone, union of a tendon, &c.; because they have still less power than those which are substitutes for parts originally formed."

134. In diseased conditions of the body, in which the absorbent function becomes morbidly active, such election as above alluded to, becomes most instructively remarkable. In scurvy, for example, in the extremity of the disease, the natural tissues come to be taken up until vessels are opened and blood is poured out from various parts of the body, and ghastly ulcers are formed in its solids. But, before arriving at this period, it has been constantly remarked on long voyages which have been productive of a general scorbutic tendency, that all consumptive symptoms, tubercles, wens, and other morbid parts, first disappeared; and that, after this, as was particularly remarkable in Lord Anson's celebrated voyage, the new formed natural tissues next gave way, and ulcers and wounds, which had been healed, were again opened, and bones long since fractured and knit, were disunited by absorption of the connecting callus; and then followed the absorption and destruction of the primitive natural tissues. This scale of elective gradation, which is the result of considerable research into the subject, and which

accords with Mr. Hunter's observations, places tubercle in the list of the most *easily absorbable substances*—the *adventitious!*

135. Why, then, it may be asked, are tubercles sometimes found so difficult of removal? Probably because albumen is in excess in the blood, and its deposition in the tissues continues to be equal to, or in excess of, the absorption. And to correct this degeneration in the blood, is the leading indication, and consequently should be the first and the leading object of treatment.

136. *Removal of Tubercles from the Lungs.* But yet another question arises which is of consequence in the investigation. It is tubercle in the LUNGS, which constitutes phthisis—can it be removed thence by absorption?

137. We know that it is thus removable from the tissues of the neck, and what reason can be assigned why it should not be in like manner removable from the lungs? The lungs are more abundantly provided with absorbent apparatus; and the vicissitudes and diseases to which they are subject, produce more frequent necessity for energetic absorbent action there, than is requisite for the tissues of the neck. Vast pneumonic effusion and hepatization we see removed in a period astonishingly limited. The external and internal surfaces of the lungs are constantly lubricated by serous and mucous secretions requiring perpetual active exercise of the antagonizing absorption; without which we should have the occurrence of dropsy in the chest. In catarrhal affections, we may remark mucous rattle pervading the lungs, producing a difficulty of respiration bordering on suffocation, and yet when

successful in producing absorbent action, all is relieved in a few minutes, and respiration becomes easy, noiseless, and natural.

138. Such are some of the common exigencies to which the lungs are exposed, and which demand frequent and sometimes unusually energetic absorbent power. They are, at least, greater, and of more frequent occurrence, and are more urgent than those to which the structures of the neck are liable; and if it is here as we discover it to be in other parts of the body, that the functional powers are adapted to the exigencies to which they are respectively subjected, absorption must be of at least equal vigor in the lungs, as in the neck, or in any other part of the body.

139. "It often happens that children," says Andral, "while still very young, towards the period of weaning for instance, are attacked by an intestinal or pulmonary irritation, which disappears after having lasted for an uncertain period. They then recover their health, but many of them continue habitually pallid; their muscular system remains imperfectly developed, and their limbs are slight; they are, in fact, what is called delicate; some are affected occasionally with either cough or diarrhœa; others do not even present these symptoms. At last, towards the age of 4 or 5, the cough returns, but in a much severer and more obstinate form; the digestive functions become deranged; emaciation succeeds; a fatal termination ensues; and, on opening the body, tubercles are found in every part of it."

140. In cases of the above description, I have had patients so attenuated that tumors in the mesentery could be felt through the parietes of the abdomen,

when, at the same time, there were symptoms and signs of tubercles in the lungs. And when successful in their treatment, in every case in which I have particularly attended to this matter, the indications of disease have disappeared from the lungs before they have subsided in the abdomen; and, occasionally, a considerable time before the mesenteric tumors had ceased to be perceptible to touch. In similar cases, not constantly confined to children, in addition to the abdominal and pulmonary indications, the cervical glands have been involved. In these cases, I have witnessed the entire removal of pulmonary indications, before any perceptible diminution occurred in the cervical tumors. And when, afterwards, the tumors began to lessen, they were commonly absorbed with surprising despatch, sometimes entirely disappearing in a few days.

141. The above detail comprises a brief survey of observations and reflections, which have satisfied me that pulmonary consumption is curable in all its stages. Laennec has clearly demonstrated that it is sometimes curable, even in the extreme, the putrefactive and ulcerative stage; my own experience satisfies me, independent of the authorities I have referred to, that it is generally curable in the first stage. And I am satisfied that in the premonitory stages, if the diathesis is properly treated, the disease may almost invariably be *prevented*. (See chap. vii.)

142. But, unfortunately, application for medical advice is generally deferred until the last stage of the disease. This apparent supineness seems to arise from an apprehension in the public mind, that medical treatment of the consumptive is hopeless or hurtful,

and tends to curtail the brief natural period of their existence. This prejudice, with reference to the antiphlogistic plan of treatment, I believe to be well founded; and as this is the method practised by a considerable number of physicians, it is not to be wondered at, that observation should have produced a conviction, that nostrums and quack medicines, which are generally merely palliative, are to be preferred to treatment so palpably detrimental.

CHAPTER IV.

CAUSES OF CONSUMPTION.

143. From the preceding observations, it seems that, so far as at present advised, we are to look upon albuminous degeneration of the blood, as the proximate cause of tubercular disease. And it follows, as a necessary consequence, that all such things as tend to produce this degeneration, must be deemed predisposing or exciting causes. Hence, as the condition of the blood is constantly varying on account of casualties to which the body is subjected, and in consequence of its various offices in the system, we necessarily have various causes of consumption.

144. In its constitution, the quality of the blood, is dependent upon, or is materially modified by, the quality and quantity of food, and the healthfulness of the digestive organs.

145. But even with suitable food and perfect digestion, the blood may be subject to degeneration. For, the decomposed, disorganized, and worn out portions of the solids of the body, are absorbed and passed into the blood to be conveyed to the excretory organs—the lungs, the skin and the kidneys: to be thence eliminated from the system. Hence the interruption of function in those organs, or in any of them, may both impair the purity and materially change the quality of the blood.

146. *The decomposed elements*, which are conveyed to those organs in form of carbon, oxygen, hydrogen and nitrogen, if not immediately eliminated, are pro-

ductive of violent effects, and speedily destroy life. *The disorganized principles*, which, as heretofore shown, (83,) are constituted chiefly of albumen and water, may be retained without immediate deleterious consequences. But when retained and filling the vessels to the exclusion of chyle, (89-90-91,) they presently become productive of the serous degeneration, which, when excessive, eventuates in dropsical effusion on the one hand, or tubercular deposits on the other. (79-80.)

147. All such matters and things, then, as tend to interrupt nutrition, or to obstruct excretion, are exciting causes to a degenerate condition of the blood—which is the proximate cause of tuberculous disorders.

148. *Occasional Causes.* It constitutes no inconsiderable evidence of the truth of our pathology, that an enumeration of the conditions and casualties adequate to the production of serous degeneration of the blood, will be found to comprehend a catalogue of all the prominent causes to which consumption has ever been ascribed in the annals of medicine, from the remotest antiquity to the present day. The results of the experience and observation of ages:

149. 1st, *As affecting the function of chylification;* with reference to insufficient or improper food, fasting, debaucheries, excessive fatigue, night-watching, excessive discharges, lingering diseases, especially dyspepsia, and insufficient food in convalescence from chronic diseases.

150. 2d, *As affecting respiration;* with reference to contracted, flat and badly proportioned chest, fractured or depressed ribs, impure air, or diseases or

substances obstructing the air passages: as catarrh, pneumonia, pleurisy, asthma, measles, hooping-cough, inhalation of dust, iron-filings, or mephitic gases, &c.

151. 3d, *As affecting perspiration*; with reference to sudden alternations of temperature, insufficient clothing, long continued exposure to inclement weather, sleeping in damp sheets, or in humid or exposed situations.

152. 4th, *As affecting all of those functions*; with reference to sedentary habits, or insufficient or inappropriate exercise: the depressing passions, as grief, anxiety, terror, &c.

153. Those may be divided into predisposing and exciting causes:

154. *Predisposing causes.* *Hereditary tendency* is generally reckoned the principal predisposing cause of consumption. But in a disease which is independent of any specific virus, and which arises simply from weak or badly constituted blood—a constituent of the system, which is directly derived from the food—there is reason to believe that too much stress is laid upon this right of inheritance. That the blood of the infant at, and prior to, birth, is part and parcel of that of the mother, is, according to received physiology, unquestionable. But this would afford no ground for derivation from the father; which the hereditary hypothesis assumes as the more frequent of the two. The great appetite, vigorous digestion, and rapid changes of the entire system in early life, afford but little reason to surmise, that the foetal blood can have much to do with diseases of puberty, or of manhood. That members of the same family very generally bear a resemblance to each other, in *personal configuration*,

is a matter of common observation. And so far as regards *phthisis*, my observations and investigations, induce me to believe, *that this is all of hereditary descent, which at all tends to the production of this disease, with the exception, perhaps, of the estate and the hereditary or family mode of living.* The same is also most probably the fact with regard to hereditary gout, inasmuch as each of those diseases seems mainly to depend on the constitution of the blood, which is elaborated from food, and is known to vary according to the quality and quantity of food, and the power of the digestive organs.

155. M. Laennec yields to the hereditary hypothesis; but does so, it would appear, chiefly in deference to popular opinion; for, his instances, in affirmation, amount to nothing: while his exceptions are very strong. "One family," says he, "in particular, I myself knew, in which the father and mother died upwards of eighty years of age, and of acute disease, after having seen fourteen children, born healthy and without any seeming predisposition to disease, successively carried off by consumption, between the ages of 15 and 35." M. Louis offers no opinion in the case; but the result of his inquiries is decidedly adverse. "One-tenth of our patients," says he, "were children of parents, one or both of whom appeared, as far as we could judge, to have died of *phthisis*." "One-tenth" of the descendants of a population more than a fifth of which died of *phthisis*! would exhibit the descendants of the non-tuberculous to be in a large proportion more liable than those of the tuberculous; which, certainly, is not the fact. Louis supposes the result to have been affected by the difficulty of getting correct information from hospital patients.

156. Hereditary personal resemblance is, at all events, strikingly evident from generation to generation. And this, at least so far as it affects the capacity of the excretory organs, must necessarily have its effect on the constitution of the blood. Such family resemblance, too, we very frequently see bearing those lineaments and proportions, which, from the days of Hippocrates to the present time, have been recognised as evincing the tuberculous diathesis.

157. The slender form, the long neck, the brilliant whiteness of the skin, the bright red of the cheeks, the narrow or flat chest, the projecting or winged configuration of the shoulder blades, and the delicacy of the limbs, with unusual flow of spirits, and early acuteness of understanding, are characteristics which no experienced physician can fail to recognise as indicating constitutional predisposition to consumption. These characteristics are sometimes seen to pertain to entire families, and to extend through several generations.

158. In the above portraiture, the indications of deficient excretory organs, are the most striking characteristics: the narrow, flat chest, restricting the play, and indicating the diminutive volume of the organs of respiration; the whiteness and transparency of the skin exhibiting thinness and want of volume in the important organ of perspiration; but too clearly exhibit the most essential prerequisites for the production of the albuminous degeneration of the blood, as heretofore explained. (83-91.)

159. The constitution of the skin, I consider almost as indicative of predisposition as the conformation of the chest. If with this, as with other organs,

the power is, *ceteris paribus*, in proportion to magnitude, the *thickness of the skin* must be of very material importance to diagnosis. My own observations in the matter, induce me to consider this at least more to be relied upon than the color. Indeed I have constantly found a very thin skin, whether white or not, pertaining either to the tuberculous or to the dropsical diathesis. I never have examined the skin in a case of *chronic* phthisis, whatever was its color, that was not both thin and smooth, except in clay eaters, and in those in whom the skin itself was evidently in a state of disease; in these I have found it doughy, muddy complected, and uneven, both in density and thickness.

160. Whiteness and thinness of the skin are generally found to coexist, not only in man, but also in the brute creation. Butchers are familiar with the fact that dark colored cattle have very uniformly the thickest skins; and in buying their beeves, where the hide sells by the pound, the color enhances the value of the ox. Graziers notoriously consider white cattle harder to keep, and less healthy, than those of dark colors.

161. The thickness of the skin may generally be investigated on the back of the hand, about the wrist, on the insteps of the feet, along the front of the tibia and over the olecranon. In other parts it is so connected with subcuticular and adipose matter as to interfere with examination even in the extremely emaciated.

162. *Exciting Causes.* Consumption is frequently developed independently of constitutional predisposition. Sometimes by a combination of strong exciting

causes, it may be ushered in, in defiance of even an entirely opposite diathesis and character of the system. The combinations, for example, of deficient and innutritious food, bad air, want of exercise, exposure to cold and moisture, may produce it in the most healthy and the best proportioned. Pinel furnishes examples of its occurrence in such, simply in consequence of close confinement in prison, and restriction to *insufficient* food.

163. Dr. Jenner, Dr. Barron, and Dr. Carswell,* have produced the same result in inferior animals. (125.) The cause was rendered palpable by placing some of the animals, so affected, in healthful situations and supplying them with abundance of wholesome food; under which the disease disappeared again.

164. *Climates.* Chroniclers in medical science in all ages preceding ours, and even many of the most distinguished of this age, concur in representing consumption as *most* incident to the inhabitants of temperate, and *least* to those of tropical climates. They generally concur in ascribing this result to the moisture and variability of temperate climates; whilst, in frigid regions, "the cold, dry and bracing weather invites to exercise, strengthens the system, and gives tone to the digestive organs;" and in tropical climates the heat promotes perspiration and regulates the temperature.

"Phthisis, pulmonalis," says Wilson Philip, "is mentioned in the medical writings of every period since the days of Hippocrates. It is a disease of temperate

* Carswell on Tubercular Diseases.

climates, and in no country so frequent as in Great Britain.”*

Such has been, and still is, as far as I am aware, the general public estimation; such are also the opinions of the most prominent medical writers; and such the reasons generally assigned. It may be seen that it is not at all in accordance with *modern statistics*, which exhibit the mortality from consumption to be much greater in *tropical* than in *temperate regions*. (589–590–591.) Whether this is a result of change in mode of living in those regions, or whether the ancient and long cherished contrary notion, was but one of the many delusions from false theory, remains to be settled by farther researches.

165. But with the decidedly predisposed, any of the exciting causes enumerated, if regularly continued, will, in a given period, prove sufficient for the production of phthisis, whether affecting the chylopoetic, the respiratory, or the perspiratory apparatus:—such as dust or other foreign irritants to the air passages; pneumonia, measles, or such diseases as produce excessive bronchial secretion, calculated either to render the bronchiæ impervious to the air, or to interpose viscid secretions between the inner coats of the vessels and the inhaled air; or, in fine, any irritant disease, or deposit, whereby the decarbonizing function of weak lungs is rendered weaker.

166. Exciting causes, which act upon the functions of the skin, are more frequent, and often more violent, than those especially pertaining to the lungs; and, indeed, sudden checks of perspiration, from alternations of weather, or from long continued exposure to

* Wilson on Fevers.

cold, sleeping in damp beds, &c., operating through the skin, are the most frequent causes of pneumonia, catarrh, and pleurisy, the most violent of the diseases ascribed to the respiratory organs, and affecting the lungs through the intimate sympathy which exists between them and the skin.

167. The exciting causes which operate through the digestive organs, although less palpable, less violent, and less alarming than the preceding, are more abiding, and are more essentially deteriorating to the blood; and whether of primary or of secondary origin, constitute the most frequent cause of regular, fixed consumption. This is the function and the process upon which depends the formative constitution of the blood, which cannot be well constituted unless derived from good and sufficient food, and elaborated by good and healthy digestion.

168. The influence of the renal excretions in phthisis, have been less investigated, and seem to be less understood. The functions of the kidneys seem to me to be more intimately connected with the liver and the arthritic diathesis, than with the lungs and the tuberculous. The most devoted attention I have ever bestowed upon the urinary excretion, in the hope of rendering it subsidiary to diagnosis, has eventuated in nothing of appreciable value. I have generally found it of the natural straw color, and destitute alike of hypostasis, nubes, or enæorema. In two cases where tubercles were from other indications in the process of rapid absorption, I have remarked an albuminous deposit; but, generally, the most palpable changes in the patient, either for the better or for the worse, were not indicated by any change whatever in the character of the urine.

169. The most devastating effects ascribed to any exciting cause, seem to have originated from some of those mental operations, acting through the nervous influence, which subdue and impair, at once, all of the invigorating and regenerating functions both of body and mind. A most instructive exemplification of this description of causality, is furnished by Laennec, in his great work on diseases of the chest, in a narrative of the annihilation of a fanatical association, by phthisis, which he ascribed to "the depressing passions."

170. "I had under my own eyes," says he, "during a period of ten years, a striking example of the effect of the depressing passions in producing phthisis; in the case of a religious association of women, of recent foundation, and which never obtained from the ecclesiastic authorities any other than a provisional toleration, on account of the extreme severity of its rules. The diet of these persons was certainly very austere; yet it was by no means beyond what nature could bear. But the ascetic spirit which regulated their minds, was such as to give rise to consequences no less serious than surprising. Not only was the attention of these women habitually fixed on the most terrible truths of religion, but it was the constant practice to try them by every kind of contrariety and opposition, in order to bring them as soon as possible to an entire renouncement of their own proper will. The consequences of this discipline were the same in all; after being two or three months in the establishment, the catamenia became suppressed; and in the course of one or two months thereafter, phthisis discovered itself. As no vow was taken in this society, I en-

deavored to prevail upon the patients to leave the house as soon as the consumptive symptoms began to appear; and almost all of those who followed my advice, were cured, although some of them exhibited well marked indications of the disease.

“During the ten years that I was physician to this association, I witnessed its entire renovation, two or three different times, owing to the successive loss of all of its members, with the exception of a small number, consisting chiefly of the superior, the grate-keeper, and the sister who had charge of the garden, kitchen, and infirmary.

“It will be recollected that these individuals were those who had the most constant distractions from their religious tasks, and that they also went out pretty often into the city on business connected with the establishment. In like manner in other situations, it has appeared to me that almost all of those who became phthisical, without being constitutionally predisposed to the disease, might attribute the origin of their complaint to grief, either very deep, or of long continuance.”

171. It seems to me that in the above narrative, too much is ascribed to the single cause of grief, and that too little consideration is given to deficient diet and want of exercise. The exceptions in the case are significant of this; they were precisely of those who could indulge, undiscovered, or, perhaps, without palpably making the discovery themselves, in better living than the rest: they were the superior, the gardener, the marketer, the cook, and the grate-keeper.

172. When the excretory functions are interrupted,

there is reason to believe that there is not only retention of disorganized debris, but also of elements of decomposed matters, which we often see acting upon the system, in a manner very similar to the effect of an inhalation of mephitic gases, or of miasmata; or, still more analogous, to the absorption of softened tubercle, or of putrid pus, irritating and disturbing all the organs to which they are determined.

173. One of the first effects of irritation upon a secretory organ, is the suspension of function; and, subsequently, when this is re-established, the secretion is almost always increased in quantity and altered in quality.

174. From the lungs the principal elementary elimination consists of carbon; of which experimentalists estimate that about eleven ounces is discharged from the lungs of an adult daily. When this process is arrested the system becomes violently excited, the arterial action becomes strong, the pulse full and frequent; after two or three minutes the frequency is found to continue, and rather to increase; but the fullness subsides, and the pulse grows weaker and weaker, and in from four to six minutes ceases altogether. On opening the animal, the arteries and the left cavity of the heart are found to be empty; while the veins, the pulmonary vessels, and the right cavity of the heart, are distended with black blood;* which looks as if it had been suddenly stopped short in its course. This is probably the effect of a process sim-

* The above results are from experiments made in 1818, during the preparation of my inaugural thesis upon resuscitation of suspended animation.

ilar to that by which the glottis becomes closed to exclude matters unfit to be admitted into the lungs; such as crumbs, drops of water, carbonic acid gas, &c. And upon the same principle, and by the same *modus operandi*, that irritation produces cessation of function in the irritated organ.

175. From this it would seem, that carbonized blood is heterologous matter to the left cavity of the heart; and when highly carbonized, becomes an irritant to such a degree as to cause suspension of function; but when carbonized in less degree, is capable of being circulated, though it irritates the heart and arteries into febrile action, as does miasmata, or mephitic air. Thus we have at least analogical reason to conclude that, in this condition, blood may become an *irritant* of all the organs and tissues to which it is distributed; and, instead of imparting a healthy stimulation to the functional process, it may become productive of morbid action, interrupting the functions, and vitiating the secretions, in a greater or less degree, according to the greater or less quantity of retained debris.

176. These observations indicate that the retention, or non-excretion of the disorganized matters, not only tends to the albuminous degeneration of the blood, as heretofore shown, (89-90,) but, that, when in considerable degree, there is reason to believe there is retention also of a portion of the elements of the decomposed matter, which becomes productive of disturbances calculated to give the disease a procreative character.

177. Every tuberculous deposit in the lungs lessens more and more their capacity to ærate the

blood; and it is, consequently, less and less perfectly decarbonized. This deterioration goes on, until the blood presently becomes an irritant instead of a stimulant; the consequence of which, is, functional derangement, and vitiation of secretions, disturbance of digestion, and imperfect, impure, or insufficient elaboration of chyle.

178. The deficiency of chyle, physiologists teach us, is amended by more rapid solution and absorption of the tissues of the body; for, a certain degree of fullness of the vessels is essential to prevent collapse; (as we may see exemplified in cholera;) in which process, as heretofore shown, the supply is essentially albuminous, (83-90;) increasing the preponderancy of the very principle requisite for the formation of tubercles.

179. Of all the causes to which consumption has been ascribed, none can lay claim to greater antiquity, to higher authority, or to a greater share of popular concurrence, than inflammatory action in the lungs. And it is still the opinion of many able pathologists, that inflammation is not only a cause, but a necessary condition for the development of tubercles.

180. But the researches of several eminent modern pathologists, would seem to establish the fact, that *it is not necessary* to the production of the disease; and, indeed, that in the early stages of consumption it is but rarely a concomitant. When coexisting at any stage, it is generally found bearing more the appearance of a consequence, than a cause.

181. Whatever may be the value of the settlement of this question, the advantages resulting from the investigations and discussions, are unquestionable.

Mainly through this, the fact has been disclosed, that catarrhal, bronchial and pneumonic inflammations, are, almost invariably, seated in the lower lobes of the lungs, whether coexisting with tubercles or not; while tubercles are as constantly restricted to the upper;—a disclosure extremely important to diagnosis.

182. Louis's researches go farther, and tend to establish the fact, that the two conditions pertain more to opposite diathesis, than to coincident. Out of 162 cases of consumption examined by him, 70 were men; 92 women; being more women than men in the proportion of 9 to 7: while of 75 cases of pneumonia, occurring within the same time, only 23 were women; 52 being men; or, more men than women in the proportion of nearly 5 to 2. In bronchitis the disproportion was a little greater. He and Laennec are concurrent in the opinion that inflammation is in no case a cause of phthisis.

183. Andral is less thoroughly exsanguine than the preceding; though in the main, concurrent: "In the formation of tubercles," says he, "as well as that of every other morbid production, theory shews that irritation is an energetic, and very frequent, but not a necessary cause. Irritation, without the concurrence of other causes, can no more account for the formation of tubercles, than for the particular nature of each of the innumerable alterations of nutrition and secretion it so often precedes, and which are developed, not by it, but through it.*"

184. My observations have induced me to consider the disease, generally, as occurring independently of

* Andral's Morbid Anatomy.

inflammation. But the tuberculous deposit has frequently seemed to be accelerated by its presence; and whether in character of a cause, or a consequence, it certainly is at least a very frequent and a very troublesome complication. Nor can I discover either in the character of the diathesis, or in the pathology of the disease, any reason why inflammation should not be as frequent an exciting cause in this, as in its prototype, dropsy, which we see so often palpably developed through it. If a deposit from sanguineous degeneration,—it seems but reasonable to suppose, that the more blood the greater would be the deposit.

185. That every pneumonia, or bronchitis, or other inflammatory attack of the lungs, is not productive of tubercles, is no evidence that an attack of the kind, supervening on an albuminous diathesis, should not be. We see ordinary attacks of inflammation, pretty uniformly followed by anasarca, in persons of lymphatic temperament; yet this is so rare with others, that it by no means applies as a general rule.

186. My own observations, too, have led me to consider the presence of inflammation in the lungs, as the most common cause of those general and overwhelming tuberculous deposits, distinguished as constituting *acute phthisis*; in which tubercles are rapidly developed, and as rapidly decomposed, or softened.

187. And, in ordinary phthisis, the softening of tubercle and appearance of vomicae, I have found pretty constantly preceded by symptoms of local inflammation: such as local pain or soreness, and generally accompanied with slight crepitus, hectic fever, and sweats. Those precursors are so uniform, that I have been able by them, in many cases, to presage the

rupture of a vomica, and the occurrence of tuberculous expectoration, a day or two in advance. Chiefly on this account, I have always very much dreaded the supervention of a catarrh or a pneumonia, in my consumptive patients; for, whether in character of cause or effect, they uniformly accelerate the softening; sometimes producing the formation and rupture of such a number of vomicae simultaneously, as to overwhelm the patient, by suddenly converting an ordinary phthisis into a galloping consumption.

188. We can readily suppose that with such a number of ulcerous caverns in the lungs, and the ordinary degree of inflammatory congestion consequent on such a condition, together with the presence of so large a quantity of *soft* tuberculous matter, in the state and condition to be easiest absorbed, and most calculated to irritate and pervert the organic functions, there would ensue a rapid and general development of tubercles. Laennec, apparently, was familiar with such events, although he does not seem to have looked to inflammatory action as the cause.

189. "Of all the occasional causes," says he, "which can give rise to a considerable development of tubercles, the most powerful the most evident, and the most frequent, is, unquestionably, the softening of a certain number of tubercles previously existing, since we know, as was formerly remarked, that it is at this period that the secondary irruptions of numerous tubercles take place in the lungs, and sometimes also in other organs."

190. Now, Laennec both denies the curability of phthisis by process of absorption, and of its production by or coincidence with inflammation. I am totally

unable to comprehend when tuberculous matter can be thus conveyed from one place to another in the body, why it may not be emptied out, or eliminated, as readily as re-deposited. Nor am I able to entertain the conception of numerous caverns, or even of one ulcerous cavern, in any part of the body, the lungs not excepted, without the concomitant conception, of a like degree of inflammation about it, with that which I have been accustomed to see about such ulcers, when seated elsewhere, whether discovered in the cadaver or not. And, moreover, this negative cadaverous evidence is more than balanced by the living evidence derived from analysis of blood, manifesting the constant presence of inflammatory action, in this stage of the disease,—the blood being uniformly *excessively fibrinous*. (52-63.)

CHAPTER V.

SYMPTOMS OF PHTHISIS.

191. In phthisis, there may be observed *two*, and only two, well marked periods or stages in the progress of the disease. The first, extending from the onset to the softening of the tubercles. The second, from the period of softening to the termination of the disease.

192. For the physician's consideration, the first stage is much the most important. It is then only that he can hope to effect a cure, without ulceration, loss of substance and mutilation of the lungs. And, indeed, it is only at this period that any certain calculations can be made as to the curative result of treatment.

193. After the tubercles have softened, and the dissolved matter, which is generally more or less putrid, comes to be absorbed, we have all those rigors and flushes, sweats, vomitings, diarrhœas, and functional disturbances superadded, which experimentalists have observed to occur from the introduction of any other putrid matter into the tissues or vessels of animals, and which so generally prove fatal to them, and which necessarily so interrupt chylication and disturb and modify the requisite treatment, as to destroy all chance for precision in the prognosis.

194. The symptoms, physical signs, and personal indications of the first stage, therefore, should be most

familiarly known. The physician, who at this critical period carelessly examines an applicant and fails to detect the lurking demon within, and who ignorantly lulls his victim into security; until his case becomes irremediable, is wholly inexcusable, even if guiltless.

195. At this most interesting period, when a clear knowledge of diagnostic indications is so vitally important, both the symptoms and the signs are the most obscure and equivocal. For, of all known diseases, phthisis is the most insidious: often in its onset, so simulating the character of common and unimportant disorders, that it is sometimes far advanced and even merges into the second stage, before it arrests the attention either of the patient or the physician.

197. *First Stage.* *The cough* is generally the earliest symptom which attracts attention; and this is in many cases, but little regarded, as it differs in no respect from that which accompanies a common cold, expected soon to abate, as it often does and even entirely ceases, and recurs again; and the cessation and recurrence may be repeated again and again; which, instead of increasing the alarm, more frequently engenders a familiarity that causes it to be less regarded. Each recurrence is ascribed to fresh cold, taken by some real or imaginary exposure to alternations of temperature, sleeping in damp sheets, check of perspiration, or some other ordinary cause of catarrh; lulling into security and preventing resort to investigation of the case.

198. The cough is attended with clear expectoration, resembling frothy saliva, and not distinguishable by any visible appearances from the expectoration in a common cold.

199. The ancient distinction of saltness and sweetness, which has been discarded by modern pathologists, is, in fact, the only *diagnostic* afforded by the sputa. And this I consider not only valuable as a diagnostic, but also an important pathological indication. The sputa in either case is but a serous exhalation, and the difference between the acrid salt-rheum of the plethoric, and the bland, maukish froth of the tuberculous, is both striking and significant.

This *catarrhal rheum* will inflame the nose and excoriate the upper lip of the plethoric; or of the thin, who have thick, rough skin, with spongy bleeding gums, (the scorbutic diathesis;) while a similar *catarrhal* discharge produces no irritation upon the noses of persons of the tuberculous diathesis, though the sensibility of the latter is more exalted, and the skin more tender, and more susceptible to irritation than that of the former. But nevertheless, individuals of the latter description, when laboring under *tubercular cough*, can generally distinctly discriminate the diminished degree of saline taste of the expectoration of *this*, compared with that of their *preceding catarrhs*.

200. *In some cases there is no expectoration prior to the softening of the tubercles;* but when existing, after continuing an indefinite time, sometimes several months, it changes to a more opaque and sometimes to a greenish sputa. In some cases those early symptoms are preceded or accompanied by hæmoptysis.* But I myself never have seen *hæmoptysis in phthisis* that was not followed by tuberculous expectoration—indicating the second stage of the disease.

* This leads to investigation, and is therefore a most fortunate symptom, provided the discovery eventuates in appropriate treatment.

201. As the disease progresses, the lungs becoming more and more filled with tuberculous matter, respiration is found to be more easily hurried on taking exercise, especially in walking up an acclivity or ascending a flight of steps.

202. Accompanying or succeeding the foregoing symptoms, sometimes preceding them, the chylopoetic viscera become disordered; the appetite becomes irregular; there is a craving on one day and a loathing of food on another; the bowels are alternately affected with constipation and diarrhœa, and frequently with flatulency and acidity.

203. Sleep becomes dreamy, restless and unrefreshing; pains of variable intensity are sometimes experienced between the shoulders, and in the sides of the chest, and through from the sternum to the spine.

204. As the disease advances, sometimes irregular paroxisms of fever occur, attended occasionally by night sweats. Though these are most rare symptoms prior to the softening of tubercles; and but rarely, if ever, occurring in the first stage, unless the accumulation of tubercle in the lungs is such as to interrupt respiration and decarbonization of the blood in an unusually excessive degree. Under such circumstances death sometimes occurs in the first stage from suffocation.

205. These are all the common symptoms which characterize the first stage of consumption; and it but rarely happens that even they are all present in the same case. In some the symptoms are so few, so mild and insidious, that the disease advances into its second stage before its existence is detected, or even suspected.

206. *Physical Signs.* The respiratory murmur is generally less soft and more feeble under the clavicle of the affected side than that of the other; and from the same part the resonance of the voice is greater, and percussion elicits a duller sound; though in many instances the signs are, at this stage, as unsatisfactory as the symptoms.

207. But in most cases, when taken together, they afford unequivocal evidence of the existence of the disease. If on comparing the two sides, we find that under one clavicle the sound elicited by percussion is evidently duller, the respiratory murmur harsher, and the voice more resonant, together with symptoms above detailed, there need be no doubt in the case. The bronchial expiratory sound discovered by the lamented Dr. James Jackson, Jr., a short time previous to his death, is perhaps the earliest and most valuable pathognomonic sign in phthisis, and even exclusively of rational symptoms, which are occasionally entirely absent, this, with its inevitable accompaniments, may generally be taken as diagnostic. An increase of the *expiratory* sound, even in a very moderate degree, on one side more than on the other, with a harsh or rough *inspiratory* sound, compared with the natural vesicular murmur, if united with the tubercular aspect, (208 and 513,) and with any degree of decided dull resonance on percussion, may much more safely be acted upon as pathognomonic than otherwise.

208. In some cases the change in personal appearance and in disposition, may be of essential value to diagnosis. The face in most cases, in this stage, becomes paler, and frequently changes color; being at times, especially early in the day, faded and expressive

of languor; progressive emaciation becomes evident; the skin loses its elastic feel, and the flesh its firmness; slight exertion produces fatigue and exhaustion; and there is generally indisposition to every thing like effort, either mental or bodily. This, together with the personal conformation, the skin, and the complexion of the tuberculous diathesis heretofore given, (157 and 159,) would demand and ought to receive the appropriate treatment and regimen of phthisis, independently either of signs or symptoms; on the principle of the maxim, that prevention is better than cure.

209. *Second Stage.* However obscure may be the diagnostics of phthisis in the first stage of the disease, there are no grounds for complaint on this score on the arrival of the second; the change to which consists essentially in the commencement of the decomposition of tubercles.* On the occurrence of the softening of tubercles, the symptoms alone become sufficiently characteristic to determine the nature of the disease; and signs become valuable only to determine its extent.

210. *Hectic Fever.* The commencement of this stage is most strikingly marked by the occurrence of the hectic fever. Or, if this had previously existed, by aggravation of its exacerbations. The rigors become more protracted, the pyrexia more intense, and the sweats more copious and exhausting.

* I know no other process by which this change of character in tuberculous matter can be brought about, but the putrefactive; especially when the softening commences in the interior of the tubercle, as generally is the case.

211. *Sputa*. Along with these aggravations, or shortly succeeding them, a remarkable change occurs in the expectoration. Instead of colorless frothy, or greenish opaque fluid, heretofore expectorated, it is now either a transparent, a wheyey, or a milky fluid, containing specks, flakes or fragments of yellowish white opaque matter, varying in density and in color from that of soft cheese to that of boiled rice; and is commonly of fresh, insipid, or of sweet sickening taste, and of nauseous odor, and occasionally very fœtid.

212. *Hæmoptysis*. Hæmoptysis is of frequent occurrence as a mere vicarious discharge; sometimes wholly accidental and entirely independent of tubercular disease. I have before remarked, that my observations lead me to consider hæmoptysis to be of rare occurrence as a symptom of the *first stage* of phthisis. But it is almost an invariable concomitant, and in many cases, the first symptom of the second stage.

213. *Vomica and Tuberculous Expectoration*. I have particularly remarked that the description of sputa above described (211) is generally preceded from 12 to 24 hours by viscid wheyey or milky fluid, *streaked or tinged with blood*; after a few expectorations of this description, blood disappears, and matter striped with mealy looking particles, follows; this mealy matter is, in from 6 to 36 hours, succeeded by *curdy* or flaky matter, which is always of the color of the mealy particles preceding. After continuing an indefinite period, dependant upon the size of the tuberculous mass forming the *vomica* from whence it proceeds, this curdy matter is followed by sputa striated

with mealy particles, from which, in a short time, it changes to homogeneous matter resembling pus,* more or less benign, indicating pretty accurately the more or less benign or malignant character of the consumption. According to my observations the curdy sputa is generally succeeded by benign pus; the flaky by ichorous, sometimes excoriating the glottis and fauces, and always accompanied by the most aggravated degree of hectic.

214. *Excavation and Ulceration.* *The preceding is an epitome of the entire second stage of phthisis; tubercles or tuberculous masses, separately and successively, or sometimes many of them simultaneously soften, and either ulcerate through or rupture the tissues between them and a neighboring bronchial tube, frequently lacerating the blood vessels of the intervening parietes in the process. In which event the thinner fluid contents of the vomicae are expectorated, streaked with blood, (hæmoptysis;) next come the smaller particles of tubercle streaking a thinner matter with mealy specks; and as the fistulous passage dilates, solid portions of tubercle pass, varying from the size of a mustard seed to the magnitude of a pea, (tuberculous sputa.) This is followed by the mealy dregs again, (striated sputa;) this, by pus or ichor, indicating the more or less ulcerous character of the excavation, which the emptying of the vomicae has produced; forming a combination of symptoms perfectly diagnostic—simulated in no other disease whatever.*

* In many cases—as often as I have happened to test it indeed—I have found this matter (instead of pus) to be principally an albuminous effusion, coagulating readily on immersion in boiling water, and sometimes presenting precisely the appearance of the boiled albumen of an egg, but generally more turbid.

215. The transparent, frothy, and greenish opaque sputæ, frequently occur in common catarrh. The striated and that containing the white particles in distinct masses, are considered diagnostic of phthisis. M. Louis in his very extensive observations, has met with but two exceptions.

216. *Progress.* When the lungs are extensively tuberculated, the tubercles soften and discharge pretty much in the order of their successive formation, commencing in the upper part of the lungs and progressing downwards; presenting,

1st, Excavations.

2d, Softened tubercles.

3d, Mature tubercles.

4th, Milliary granulations.

5th, Tuberculous infiltration.

The last is sometimes found coexisting with each of the others, generally, round them. The observation of this manner of progression is important to diagnosis by physical signs.

217. *Hectic Fever.* The symptoms of hectic fever, it may be remarked, constitute the prominent changes which indicate the transition from the first to the second stage of phthisis; and hence it becomes a question of no inconsiderable practical importance, whether this is to be considered the cause, or the effect of the softening of the tubercles; and whether the softening is so desirable an event as many practitioners and writers seem to suppose.

218. *Hectic fever*, be it remembered, is not peculiar to phthisis, or to tubercular diseases. The detention of the elements of the decomposed tissues of the body—the non-excretion of the debris produce it. So also

will the absorption of putrid matter in cases of carious bones, or compound fractures, or of ill-conditioned ulcers. Experimentalists* have, indeed, demonstrated that analogous symptoms may be produced by the introduction of putrid matter into the tissues and blood vessels of healthy animals.

219. The mere absorption of *pus* is not adequate to its production; for, we often see large accumulations of this thus taken up, without the occurrence of any of the hectic symptoms. But the suppuration of a scirrhus tumor, the accumulation and retention of pus about carious bones or portions of mortified flesh, constantly produce it; while pus that is secreted in the healthy process of granulation and cicatrization never does, however copious it may be; as we see exemplified occasionally in suppuration of stumps of amputated limbs, and of great lacerated wounds; whereas that which is produced in process of ulceration constantly does, and of an intensity proportionate to the quantity produced and the obstacles to its exit, or in other words, to circumstances that favor its absorption. In like manner and for the same reason the hectic fever is always more intense the day preceding than the day succeeding the rupture of vomicae; and it generally subsides on the discharge of the matter, and ceases when the tuberculous expectoration ceases.

220. Putrid matter and pus from ill-conditioned sores, according to Sir Everard Home, are distinguished from benign pus by containing flaky matter instead of globules: "Instead of being globular, it [the pus] has a curdy-like appearance and contains flakes." This

* M. Gedwin, Magendie, &c.

is identically the description of the softened matter which we find in ulcerous excavations in the lungs, and in tuberculous expectoration. The symptoms produced by their absorption are also precisely the same.

221. The absorption of tubercles prior to their softening produces no fever, nor any other appreciable disturbance; as we often see exemplified when those seated in the neck or other outward situations are thus removed. But when they soften, wherever situated, we have the occurrence of hectic, and in intensity, proportionate to the magnitude of the softened mass, which can be relieved by no known mode of treatment until this absorption is stopped by the discharge or free exit of the matter.

I have dwelt on this particular on account of the very serious mischief which frequently results in treatment of phthisis, from strong efforts to cure hectic fever and sweats; when it would be, perhaps, improper, and certainly is impracticable, to effect it; and when their continuance during the time is very probably necessary to the elimination of the absorbed matter. (430.)

222. Tuberculous softening, then, I conceive, may be simply resolved into the decomposition or putrefaction of tubercles: and instead of a desirable it constitutes the most deplorable event in the history of the progress of phthisis.

223. The irritating character of softened tuberculous matter is evinced by its effects in pneumothorax. This occurrence, if not immediately fatal by suffocation, generally proves so in a few days from the violent pleuritic inflammation excited by the extravasated

matter. It is evinced also by the inflammation and ulceration its contact produces in the air passages, especially in the trachea, and the inner surface of the epiglottis; which must be attributable to *putrescent erosion*; certainly not to *saline excoriation*, for we see that tuberculous matter contains less than one-sixth of the saline matter common to the healthy animal fluids.

224. A pretty good idea of the identity of tuberculous expectoration and putrid tubercle, may be derived from corking up a few tea-spoons full of them in vials. When putrefaction commences, by adding a little water to them in the different stages of the process, we may have very good representations of all the different descriptions of tuberculous sputa; the curdy, the cheesy, the ricy, the flaky and the mealy particles floating in a thin fluid.

225. The following is Dr. Shapter's description of the suppuration and the character of the discharge of outward scrofulous or tuberculous tumors. It is identical with the tuberculous expectoration, and very similar to experimentally putrefied tubercle, and to ulcerative pus as described by Sir E. Home: (220.)

"The third stage," says Dr. Shapter, "consists in the more active stage of the disease as evinced by lancinating pains, febrile excitement, &c. Some portion of the superjacent skin becomes pale, and one or more small openings spontaneously occur, by which the fluid is poured out. Though this is much like pus at first, it is different from that which proceeds from an ordinary abscess, as the discharge continues it becomes less thick, until altogether little else is exuded than a viscid serum, intermixed with white tuberculous matter resembling the curd of milk, and which offers the

true distinctive character of the disease." "The fluid which is discharged when the abscess bursts," says he, "consists of flakes of coagulable lymph swimming in a half puriform fluid."

226. *Extraordinary Symptoms. Dyspnœa.* When there is a great accumulation of tuberculous matter compressing the bronchiæ and vesicles, and filling up the vesicular tissue with solid masses, respiration is rendered difficult even in the early stages of consumption; especially on taking exercise. But on the rapid succession or simultaneous softening of several masses, the most distressing degree of dyspnœa, with general prostration, is experienced. The excessive effusion into the bronchiæ is sometimes productive of immediate suffocation.

227. *Pneumothorax.* Sometimes a softened mass ruptures the pulmonary pleura, and its discharge admits air into the cavity of the chest, which compresses and collapses the lung. This, too, is productive of excessive dyspnœa, and frequently of immediate suffocation. The symptoms are not distinguishable from those of the preceding condition: (226:) but the signs are decidedly diagnostic; in this there is supernaturally clear resonance, on percussion, over the entire side, with respiratory murmur and resonance of the voice absent, or scarcely perceptible to auscultation. In dyspnœa, resonance on percussion is at first dull; as vomicæ are emptied, the percussion over the part becomes gradually less dull, the mucous rattle and the cavernous respiration follow, and then pectoriloquism.

228. *Pain of the Chest.* Wherever a tuberculous mass is situated, when it is in process of softening, ulceration and its usual consequence, inflammatory

action, take place in the tissues around it, and cause adhesion of the covering of the part of the lung over the mass with the costal pleura; and local pleurisy and pain of the part ensue.

229. *Diarrhœa.* Many cases of phthisis, indeed most cases, in young subjects, are of abdominal origin; hence the generally disturbed peristaltic and digestive functions of the alimentary canal. The alternate conditions of constipation and diarrhœa are more prostrating to the patient, more accelerating to the fatal progress of the disease, and more troublesome to regulate and control than any others which occur in its usual progress.

230. *Other symptoms,* usually enumerated and ascribed to phthisis, such as frequent pulse, sweats, thirst, emaciation, œdema, apthæ, incurvation of the nails, falling of the hair, &c., might here be dwelt upon; but I conceive it would only tend to obscure the subject to consider them separately, inasmuch as they are symptoms alike common to almost all chronic diseases, accompanied by any of the degrees of inflammatory action; and several of them are dependant upon and merely mark stages in the progress of the hectic fever. None of them can be considered especially *characteristic* of phthisis, or diagnostic of any form of tubercular disease.

231. *Terminations.* Tuberculous masses sometimes successively soften and discharge, the ulcerous excavations heal, the remaining tubercles are absorbed, and the patient recovers with a crippled, mutilated condition of the lungs.

232. But more frequently the inflammatory congestion attendant upon the ulcerative process, at this

advanced period, accelerates the tuberculous deposits more than the softening of the tubercles, even under the most favorable circumstances, can accelerate their expectoration and absorption, and the disease extends deeper and deeper into the lungs. All the symptoms grow worse, the hectic fever becomes continuous, the pulse without intermission becomes at all times more frequent than natural, respiration is hurried and laborious; the flesh becomes doughy, and the debility extreme; the adnata of the eyes assumes a pearly lustre, the face is excessively pale during the day, and a deep circumscribed redness of the cheek which comes on towards evening renders the paleness by contrast more ghastly; the nails become incurvated, resembling talons; the hair drops off; night sweats become more copious, drenching the bed and exhausting the remaining strength of the patient; and the more frequent recurrence of diarrhœa, together with excessive expectoration, hastens the fatal catastrophe. But frequently the patient still lingers on, the pains in the chest increase, the extremities become œdematous, at first swelling during the day and subsiding at night, then becoming constantly dropsical; the chest becomes flat, the abdomen flattened and retracted towards the spine, the shoulders are raised, and the clavicles brought forward, leaving a hollow space between them, and the upper ribs; the thorax, instead of undergoing spontaneous elevation in process of respiration, seems to be dragged up by elevating the shoulders. In this extreme condition, reduced to a mere skeleton, a miserable existence is sometimes dragged on for weeks, or even for several months, and sometimes without decided diminution of mental powers; the delusive hope of possible recovery often haunting the imagination to the last.

233. *Varieties of Consumption. Acute Phthisis.* Sometimes the succession of the above described symptoms are unusually rapid in their progress, accelerated most frequently by inflammatory action, and the disease terminates in a few weeks. Such cases are commonly distinguished as *acute phthisis*.

234. *Chronic Phthisis.* When progressing very slowly, and protracting the continuance of disease to an unusual duration, it is termed chronic.

235. *Latent Phthisis.* When so mild in its character as to progress to a considerably advanced period without pain or cough, or being attended with so little of either, or of other characteristic indications, as not to have indicated the disease, or led to its detection, it is termed latent. This is sometimes owing to the phthisis having been masked; as by pregnancy, or the coexistence of other disease, or by the tubercular disease more affecting a remote part than the lungs.

236. *Physical Signs.* Our diagnosis of the first stage of phthisis is dependant almost exclusively upon the physical signs; those signs and symptoms which distinguish the tuberculous from the healthy lungs, have already been given. (206–207.) But the distinction between health and disease is not all that is requisite. A precise knowledge of the diagnostic signs which distinguish consumption from the pulmonary disorders resembling it, and for which it is often mistaken,—diseases too that require very different treatment,—is even *more* essentially important. The diseases of this description with which phthisis is most liable to be confounded, are catarrh, bronchitis, pneumonia and pleurisy.

The following are the chief physical signs by which those diseases are distinguished from phthisis:

237. FROM CATARRH.

<i>In Phthisis:</i>	<i>In Catarrh:</i>
Resonance on percussion more or less impaired over tuberculated points.	<i>Percussion</i> elicits a resonance which is slightly impaired over diseased points.
<i>Respiratory Sounds:</i> Weak and sometimes bronchial, in first stage; cavernous in second.	<i>Respiratory Sounds:</i> Weak with sibilant and mucous rattle.
<i>Voice:</i> In first stage, bronchophonous; in the second, pectoriloquous.	<i>Voice:</i> Natural.
<i>Expectoration:</i> First stage, pituitous; second stage, wheyey, sanguinolent striated, curdy, flocculent, muco-purulent.	<i>Expectoration:</i> Pituitous.
<i>Seat of Disease:</i> Almost invariably in upper lobes.	<i>Seat of Disease:</i> Generally in lower lobes.

238. FROM CHRONIC BRONCHITIS.

<i>Consumption:</i>	<i>Bronchitis:</i>
On percussion resonance impaired.	On percussion resonance impaired.
<i>Respiration:</i> Weak and somewhat bronchial over the seat of the disease in the first stage; cavernous in the second stage.	<i>Respiration:</i> Weak and irregular mucous rattle in spots over diseased portions.
<i>Voice:</i> First stage, bronchophonous; second stage, pectoriloquy.	<i>Voice:</i> Generally natural, but sometimes bronchophonous.

<p><i>Sputa:</i> First stage, pituitous; second stage, serous, bloody, striated, curdy, purulent, muco-purulent, in regular succession.</p> <p><i>Seat of Disease:</i> Almost invariably in the upper part of the lungs.</p>	<p><i>Sputa:</i> Mucous or purulent, and sometimes streaked with blood.</p> <p><i>Seat of Disease:</i> Generally in the lower lobes.</p>
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239. FROM PERIPNEUMONIA.

<p><i>Consumption:</i> Percussion dull.</p> <p><i>Respiration:</i> As above.</p> <p><i>Voice:</i> As above.</p> <p><i>Seat of Disease:</i> Upper lobes.</p>	<p><i>Pneumonia:</i> Percussion dull.</p> <p><i>Respiration:</i> First stage, with crepitant rattle; second stage, bronchial and crepitant; third, absent.</p> <p><i>Voice:</i> First stage, natural; second, bronchophonous; 3d, none.</p> <p><i>Seat of Disease:</i> Lower lobes.</p>
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240. FROM PLEURISY.

<p><i>Consumption:</i> Percussion dull.</p> <p><i>Respiration:</i> As above.</p> <p><i>Voice:</i> As above.</p> <p><i>Sputa:</i> As above.</p> <p><i>Seat of Disease:</i> As above.</p>	<p><i>Pleurisy:</i> Percussion very dull.</p> <p><i>Respiration:</i> At first weak, afterwards extinct, except at the root of the lungs.</p> <p><i>Voice:</i> At first ægophonous, afterwards extinct.</p> <p><i>Sputa:</i> Catarrhal, if any.</p> <p><i>Seat of Disease:</i> Uncertain.</p>
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CHAPTER VI.

TREATMENT OF CONSUMPTION.

241. From the pathology already demonstrated, the leading objects in the treatment of phthisis would seem to be:

1st, To restore the healthy condition of the blood.

2d, To remove the tuberculous deposits from the tissues.

3d, To remove or to change the diathesis.

242. The degeneration of the blood, we have shown, consists essentially in its impoverishment; in deficiency of red globules, and of mineral constituents, saline and ferruginous; and in excess of serum.

243. To adapt restorative treatment with precision, we must have reference to the cause of the lesion. This would seem, in *most cases*, to be primarily referable to two great leading causes:

1st, Defective excretion.

2d, Defective digestive elaboration.

These are sometimes vice versa, but perhaps most frequently the defect arises from a combination of the two.

244. Towards correcting the malformations which interfere with excretion, such as the insufficient capacity of the chest, and the deficient volume of the skin, whatever can be effected requires much time and great perseverance, and must be referred to measures for change of diathesis. (Chap. vii.) But to the treatment calculated to impart increased functional vigor, and activity to defective and weak organs, we can

resort with prospects of more immediate benefit, though less durable and less to be relied upon.

245. As the lungs in phthisis bear the onus of disease, and as remedies which increase excretion necessarily increase the action of, and determine more blood to the organs they specially act upon, our selection should be of such articles as act mainly upon the other excretory organs; that the lungs may thereby be relieved by making them, as far as possible, perform vicarious excretion. Another desideratum in the selection is, that the article be of tonic, or, at least, on no account of atonic character. It should invigorate the digestive function, inasmuch as digestion is a co-ordinate and co-operative function peculiarly important in maintaining the healthy constitution of the blood.

246. Of this description are all diaphoretics and diuretics, which are tonic and *without expectorant qualities*. I will here advert to a few that are favorites:

247. *Leontodon Taraxacum*. This is, of all articles of the class, most generally adapted to meet the indications first to be combated in treatment of phthisis. The dyspeptic condition of the stomach, commonly accompanying the disease from its earliest stages, and which often produces it, frequently causes so irritable and fastidious a condition of the organ as to render it difficult to get it to bear any article which possesses the requisite virtues, deobstruent and tonic.

248. *Leontodon* is generally inoffensive, and rather soothing than irritating. Its principal action is upon the kidneys and skin, and these it but seldom excites very perceptibly above the natural standard, except when taken in large doses and very frequently repeated.

It is ordinarily administered in doses of from 30 to 60 grains of the extract, three times a day; but to promote sensible diaphoresis, from 60 to 100 must be taken every three or four hours. Action to this degree is but seldom desirable; and when desirable, it would be better to aid the ordinary administration with decoction of eupatorium or some other kindred article.

249. Administered in the ordinary way, its effects upon the system are generally but slightly perceived until it has been used six or eight days. When it comes to be manifested by supervention of a more uniform temperature, slightly increased fullness, and greater elasticity of the skin; the pulse becomes less frequent, and is softer, sleep is less disturbed and more refreshing, the tongue is found to have assumed a more natural color, and there is regularity and improvement of appetite. This is about as far as I have ever observed the unaided effects of taraxacum. Whenever I have been able to derive such manifestations, I have substituted or added more powerful and efficient remedies. But much more exalted results are ascribed to this article by Zimmerman, Pemberton, and other eminent physicians of Europe, where it is more used and better appreciated than with us. Dr. Wilson Philip in very chronic cases of dyspepsia, and of what he terms "*sympathetic consumption*," ascribes astonishing cures mainly to this article perseveringly administered for a protracted period of time.*

250. "Dr. Rush," says Dr. Chapman, "had much confidence in the deobstruent powers of this article, and often prescribed it in hepatic affections. In evi-

* Philip on Indigestion.

dence of its efficacy, he was in the practice of relating the fact, which he learned from the butchers of this city, that liver-grown cattle are speedily relieved by grazing on fields abounding in this vegetable."* Its most general effects are those of a mild, unirritating tonic, a diuretic and diaphoretic; it has no evident action upon the lungs, and must therefore in phthisis be looked upon essentially as preparatory.

Sometimes the irritability and weakness of the stomach are so great, that the extract cannot be retained. In such cases a decoction of 1 oz. of the root, put into 2 quarts of water, and boiled away to one-half, may be substituted; half a gill to a gill, may be taken three or four times a day, simple or spiced, as most agreeable.

ANTHEMIS NOBILIS.

251. It occasionally happens that the weakness and irritability of the stomach are such that it will not bear the taraxacum in any form until its tone has been improved. For this preparatory step, chamomile is valuable. It is a pleasant stomachic, a very mild tonic, moderately diaphoretic; and it is, probably, the only efficient article which is milder and more stomachic than taraxacum. Commencing with a weak, cold infusion, of chamomile, and using it gradually stronger, we soon augment the strength of the stomach sufficiently to bear the taraxacum.

EUPATORIUM PERFOLIATUM.

252. This article is tonic, diuretic and diaphoretic in a very considerable degree; and in full doses, the warm decoction is emetic. When the stomach will

* Chapman's Therap. and Mat. Med.

bear this, it may be advantageously used in preparatory treatment, either alone or to co-operate with, and to promote the effects of, the taraxacum. A decoction of this is one of the best preparations which can be used in phthisis, to work off emetics.

SANGUINARIA CANADENSIS.

253. This is a most singularly efficacious article. Dr. Tully, to whom the profession is mainly indebted for a knowledge of its great and diversified virtues, has found it "deobstruent, *expectorant*, emmenagogue, and chologogue, and an acrid narcotic," to which I take leave to add, sorbefacient. To his essay the reader is referred for elaborate illustrations of its medicinal powers.* The high claims there set up for it, as far as tested by my experience, have all been verified, in some instances more than verified, except in relation to its expectorant effects. Used as a deobstruent in amenorrhœa in combination with taraxacum, I have reinstated menstrual excretion which had been suppressed for various periods, extending from several months to several years. Used in the same combination in depraved, irregular, and deficient action of the liver, I have found it almost as efficacious as mercury, and without its objectionable effects; the digestion, general health, and strength of the body improving from the commencement of the prescription. In a case of the kind, of 20 odd years standing, which had often in the time been temporarily relieved by mercury, until it at last utterly failed, I was completely successful in reinstating the secretion with this in combination with taraxacum.

* Medical Recorder, Vol. xiii, Jan., 1828. No. xli.

I have frequently found the sanguinaria acting as energetically on the perspiratory and urinary secretions, as in the above case on the liver; but I have never in any case been sensible of much if any of the expectorant effect ascribed by Dr. Tully. From the fact that, when I have had to discontinue it in cases in which I found it disagreed, the discontinuance never was required in consequence of irritation of the lungs, I am disposed to believe that if it acts upon those organs at all, it is very moderately. On this account I have been able to use it when no other energetic sorbefacient within my knowledge was admissible.

254. As a sorbefacient it proves highly efficacious, when used locally, in the removal of tetter and several other cutaneous excrescences. A wash of the tincture or infusion, powerfully promotes the exfoliation and removal of carious bones. Used as a dentifrice, in a few applications it loosens and separates scales of tartar which have been long deposited about the teeth, restores a healthy condition to the spongy gums, and softens and detaches carious portions from the surrounding sound matter of the teeth, to such a degree that they can be removed with a common tooth-pick, leaving the cavity ready for the reception of a plug.

255. Dr. Huff, an empirical practitioner who was many years ago, in Kentucky and western Virginia, very celebrated for his cures of white swellings, cancers and *king's evil*—(*tubercles of the neck*)—used a saturated tincture of sanguinaria internally, and liquor potassa locally. His local applications were varied in the progress of cases; but the sanguinaria was used all

the while, with no change but a gradual augmentation of the dose, from 16 up to 50 or 100 drops, two or three times a day.

256. I have treated one well marked case of acute phthisis, which yielded under treatment with taraxacum and sanguinaria, and regulated regimen, without requiring any other remedy. External tubercles afterwards occurred; a circumstance that renders the case worthy of being briefly detailed:

257. *Case.* July 18, 1841: Visited ————, aged 10. Complains of pain under right scapula, shooting through to the clavicle; has harassing cough, with copious curdy tuberculous expectoration. Has not been able to lie down for several days; sleeps sitting up; pulse frequent and feeble; tongue clean red and moist; bowels loose, discharges pale yellow; no appetite.

258. He had measles in February; caught cold, and was subject to cough until April, when hooping-cough supervened; was then sent to the country, whence he had returned two days before my visit. Percussion elicits dull resonance from the right clavicular, scapular, inter-scapular and axillary regions. Auscultation detects gurgling rattle in the right superior lobe, crepitus in the inferior, indistinct pectoriloquy below the clavicle. On the left resonance good on percussion, respiration puerile. Prescribed decoction of taraxacum four times a day; a blister plaster 1 by 9 inches applied down the spine in the inter-scapular space; vinegar whey, exclusively, for diet and drink.

24th. Pulse fuller, softer and less frequent; tongue better, cough less harassing, expectoration purulent,

pain abated, dull resonance extends over less space in upper lobe; respiratory murmur good in the lower; crepitus in posterior middle lobe:

℞ Rad tarax'm., ℥i:
 Rad sang'a. can's., ℥i:
 Aqua fluv., ℔iv.

Boil half away. A gill to be taken four times a day. A little milk allowed along with the whey; one grain of calomel at bed-time, nightly.

Aug. 4th. Has no pain, no fever, reposes comfortably in the horizontal position; tongue natural; stools greenish, expectorates benign pus. Calomel discontinued; full diet allowed.

14th. No indication of disease remaining; but I advised a persevering continuance of the sanguinaria; which, however, was not observed.

259. This case yielded so speedily, and under treatment so simple, that I was disposed to believe I had mistaken its character, and made an entry in my case-book to that effect. But on the 15th of Dec., I was called to examine a painful tumor, situated in the neck, about an inch below the angle of the left jaw, of the same patient, who was otherwise in apparently good health. I prescribed for inflamed lymphatic gland; and now copy from my notes the following:

Jan. 13, 1842. The tumor has acquired the size of a hen's egg; and another has appeared on the opposite side.

R. Camphorated mercurial ointment.

20th. First tumor has doubled its size, and softened; on opening it discharges tuberculous matter.

Feb. 9th. Opened second tumor, discharge of the same character as that of the first.

23d. Squeezed the entire tuberculous mass out of both sides.

28th. The whole inner surface of both excavations, covered with incrustation of tuberculous matter, the eighth of an inch or more in thickness. Painful tumors have appeared all around and over the neck.

R. Ung iodine.

March 9th. Tumors and discharge have much diminished, secretion of healthy pus; patient complains of pain in the right shoulder blade, has cough and purulent striated expectoration. Ung iodine discontinued.

R. Inhale vapor of iodine.

Take decoction of sanguinaria and taraxacum four times a day.

March 21st. Since the 12th instant, the face, neck, and superior part of the chest, have been daily incrustated with white, scaly, albuminous looking matter. Cough, pain, and tumor, have disappeared; but tuberculous deposit is still to be seen every day or two, in the bottoms of the ulcers.

28th. Secretion of tuberculous matter has ceased, the ulcers look healthy and are cicatrizing. Patient discharged with a prophylactic prescription, calibeates, sanguinaria, &c.

January, 1843. Patient has continued in perfect health, and manifests the appearance of having undergone a complete change of diathesis.

260. At the earliest period in the progress of treatment, when the state of the lungs and the condition of the stomach will admit of it, resort should be had to remedies directly adapted to reinstate the deficient constituents of the blood. Among these, the

various preparations of iron are of the best established efficacy.

IRON.

261. Iron constitutes an important principle of the blood, and is found as a constituent in nearly every article of food upon which man subsists. Its "preparations are powerfully tonic, raising the pulse, promoting the secretions, and increasing the coloring matter of the blood."* It must be kept in recollection that the most remarkable deficiency in the constitution of the blood of the tuberculous consists in want of coloring matter: *deficiency in proportion of globules; deficiency in saline matter; and excess in serum.* (63 and 67.) The last generally in consequence of deficiency in excretory functions. The deficiency in coloring matter used to be ascribed to deficiency in ferruginous matter. Chemists now controvert this; but, perhaps, erroneously. We see, at least, that the use of chalybeates corrects such deficiency, restores the color and increases the globules. Iron in the blood is confined almost exclusively to the globules; it is found to constitute more than half of their hæmotine or coloring matter. This is found to vary in its intensity; being brighter in arterial and darker in venous blood. Hence Liebig† conceives that the iron of the globules absorbs oxygen in the lungs, and conveys it to the capillaries of the system where it combines with worn-out tissues that are in a state of decomposition, and fits them for elimination in form of carbonic acid gas; and in the process, which is that of combus-

* United States Dispensatory.

† Liebig's Animal Chemistry.

tion, evolves the animal heat. This accounts for the known alterant and sorbefacient efficacy of iron, as well as the phenomenon of animal heat; and is more in accordance with the principles of ordinary chemical philosophy than any other theory yet suggested. "The blood contains," says he, "in form of globules, the carriers, as it were, of the oxygen which serves for the production of certain tissues, as well as for the generation of animal heat. The globules of the blood, by the property they possess of giving off the oxygen they have taken up in the lungs, without losing their peculiar character, determine generally the change of matter in the body."

262. The efficacy of iron in restoration of red globules is remarkably illustrated in the following extract from M. Andral:

"All the workmen employed in one of the galleries of a coal-mine in Auzain, were taken ill in the summer of the year '11, which was at the time considered more remarkable, as none of the miners had been previously affected, although this gallery had been constantly worked for several years before. The men who worked in the adjoining galleries were not affected, although the only difference which could be observed was that the latter were somewhat shorter and rather better ventilated than the other. The disease was ushered in by violent choleric pains, accompanied with meteorismus, and black and green stools; these symptoms were soon succeeded by dyspnœa, palpitations, and great prostration of strength; which gradually disappeared at the end of ten or twelve days, when the symptoms of general anæmia began to make their appearance. The countenance lost all color and com-

plexion, and presented an appearance similar to that of wax, which had been tinged yellow by the influence of lime; the blood vessels were so completely effaced that not a trace of them could be discovered, even in those regions where they are generally most apparent; not a single capillary vessel could be discovered on the conjunctiva of the eye, or on the eyelids, or even in the mucous membrane of the mouth; and the pulsation of the arteries was so feeble as to be scarcely perceptible. These various symptoms were constantly presented, even during the febrile paroxysms which occasionally supervened. The patients all complained of excessive debility, great anxiety, frequent palpitations, and sense of oppression and suffocation, on making the least exertion; they had constantly profuse sweats; their countenance was adematous; their appetite good, but digestion much impaired; and their emaciation advanced with rapid strides.

“This state sometimes lasted for six months or a year, and in some cases terminated in death; which was often preceded by the reappearance of the original symptoms. The protracted duration of this affection, as well as its refusal to yield to the ordinary modes of treatment, determined the medical gentlemen in attendance to consult the society of the medical school in Paris, respecting the nature and treatment of the disease. Four of the patients were sent to Paris and placed under the care of professor Halle, in the hospital of the Faculty. The remedies first employed consisted of light nutritious diet, combined with bitter infusions of hops and gentian; to these were added antiscorbutic wine, and mercurial frictions; the last more as an experiment than from any particular indication. During this treatment, one of the patients

died; on dissection all the arteries and veins were found void of blood, and containing only a little serum; no blood flowed when the muscles were divided, except on the thigh, from the large muscles of which a few drops issued. This almost total absence of blood, which agreed so well with the phenomena observed during life, induced M. Halle to discontinue the mercurial frictions, and substitute the internal use of iron filings, in the dose of a drachm daily, combined with tonics and opium. In eight or ten days an evident improvement had taken place in the patients thus treated; a few veins began to appear under the skin of the fore-arm; the digestion was much improved; and the dyspnœa considerably relieved. Each subsequent day the patients pointed out as a new discovery, one or more blood vessels, which had just become visible; all their symptoms continued to improve, and at the time they were sent home, their health was perfectly re-established.

“Appearances similar to those above mentioned were observed in the same parts of the bodies of several who died of this affection; and the same plan of treatment was employed with equal success at Dunkirk, where some of these patients had been sent, and at Auzain itself. During convalescence relapses were frequent.”

263. M. Andral also tells us that he has often remarked the rapid increase of the globules, in cases of chlorosis when treated with steel.

264. The following formula of Dr. Bland's,* is the most efficacious form in which I have ever used the

* On the efficacy of Iron in Chlorosis.

article; it is the easiest of solution, and seems the most promptly to assimilate with the circulating fluids:

℞ Ferri sulphas:
Potassæ sub-carbonas a a ζ ss:
M ft pillu 48.

The dose at first is a pill night and morning, to be increased gradually in a fortnight to 4 pills morning, noon, and night.

265. Among the earliest marks of amendment is the return of color to the cheeks and lips, and of animation to the eyes.

266. The following are two, out of a long catalogue of cases, reported by Dr. Bland, in illustration of the efficacy of his compound:

Case 1st. "A. M., aged 21, had been remarkably pale ever since her birth; but the dirty, waxen hue of her skin, had increased for the last three years. The catamenia were regular, but very scanty, and exceedingly light colored. The health, however, was tolerably good; and neither the appetite nor the plumpness had decayed. By taking the steel pills, in augmented doses for a month, she obtained bloom on her cheeks, lustre in her eyes, and vermilion in her menses.

Case 2d. "A. L., 27 years, had suffered from dysentery and ague, during the late expedition to Algiers. His skin was blanched, his strength was utterly gone, his feet swelled at night, he suffered from oppressive breathing and palpitations of the heart; and his sleep was uncertain, and disturbed with dreams. No organic mischief was suspected, and therefore the symptoms were deemed chlorotic; the diagnosis was proved correct by the speedy cure under the use of the steel medicine."*

* Med. Chi. Rev.

267. The character of the serous, or, more specifically speaking, of the albuminous condition of the blood, is but little less striking to the casual observer of the countenance. Nor is the difference there observed between the fresh, sanguine complexion of the globulous-blooded, and the pale, waxy countenance of the chlorotic and consumptive, much less remarkable, than the condition and composition their blood presents to the inspection of the physician, are important and interesting.

268. The following is a portraiture, by M. Andral, of the sanguineous temperament. In this temperament the red globules exceed the natural standard of 127; up to from 135 to 140 per 1000:

“In persons of this temperament all the functions of the body are performed with great activity; life, so to speak, is in excess; and this excess is in proportion to the increase of red globules. The digestive process goes on rapidly and efficiently; the respiratory apparatus is largely developed.” “The heat of the body is high; the surface red, and perspiration easy and abundant. There is a full secretion of high colored urine, which contains a large quantity of saline matter. Its diseased conditions are plethora, congestion, hæmorrhage and fever; which readily yield to blood-letting.”*

269. Contrast this with the ghastly, bloodless countenance, the languid frame, cold surface and the functional derangements, the indigestion, difficult breathing and irregular secretions of the tuberculous;

* Andral and Gavarrett on Changes of the Blood. From Med. Chirug. Rec.

or with the above portraiture, by Dr. Bland, of chlorotic disease, (266) which invariably, if not cured, eventuates in consumption; (which, indeed, is well entitled to be termed a premonitory stage;) and there can be no difficulty in appreciating the advantages to be derived from restoration of the deficient ferruginous principle.

270. The following is the conclusion arrived at by Dr. Edwards, from experiments on transfusion of serum and of globules: "It appears to be especially owing to the presence of the globules, the common physical properties of which we have so far studied, that the blood owes its power of arousing and keeping up motion in the animal economy."*

271. I am aware that there are members of the profession so *exquisitely sympathetic* as to inquire whether the medicine is supposed actually to pass into the blood? To such I would reply, that M. Orfila and others, have ascertained that arsenic and other poisonous and heterologous minerals, do thus pass in; and in some cases of slow poisoning, they have been detected not only in the fluids, but likewise in all the solid tissues of the body; the bones not excepted. I know not, therefore, why this, a natural and a necessary constituent, should not *readily* pass into it: nor why the globules may not be thus augmented, even to the production of hyperæmiæ in exchange for anæmiæ. I have myself repeatedly witnessed such occurrences with the coadjurancy of other remedies and appropriate regimen.

* Edwards on the Blood. From Cyclopedia of Anatomy and Physiology.

272. The *modus operandi* of *iron* in correcting albuminous degeneration of the blood, is one of the most demonstrable incident to the fluids. By reference to [262-263-265] we have evidence of its efficacy in increasing the red globules; reference to [53] shows the globules to be constituted of two parts of coloring matter; (3-4 of which is peroxide of iron,) that invests 125 parts of solid albumen. Each portion of iron imbibed, therefore, which is sufficient for the formation of a globule, abstracts or changes the condition of more than 60 fold its volume of albumen. What instrumentality the demand produced by such change of proportions in the constituents of the blood may exercise in promoting absorption of solid albuminous matter, out of tissues in which it may exist as an adventitious deposit, may be surmised, by consideration of the elective absorption exercised by the lacteals and lymphatics, in imbibing the nutriment, and rejecting the *fæces*, and in absorption of adipose matter in starving animals, &c. But whether this be the *modus operandi* or not, we have at least abundant matter-of-fact evidence that *iron* is productive of each of those important changes in the system, compared with which all speculation upon *modus operandi* is idle and profitless.

273. In children especially, the effect occasionally is almost magical. To those I have often administered iron, with little else but meat and milk diet; when affected with cough, and presenting tubercles in the neck, with tumors perceptible to touch in the mesentery, I have persevered as long as eight or ten weeks without change or abatement; repeatedly interrupted in the time by the occurrence of anorexia, or diarrhœa,

till at length came the anxiously looked for result, the vermilion lips, and the rosy cheek; and in five or six days there would not be a tumor to be found.

274. "M. Coster has submitted several animals to various experiments for the purpose of determining how far the formation of tubercles may be prevented by diet, but principally by the administration of medicines with their food. Some rabbits were fed in the open air, and in the usual manner; another set were shut up in narrow boxes in a moist, cold place, and deprived of light, air, &c.; they were fed on potatoes, turnips, &c. A third set were placed in the same circumstances as the latter, and nourished in the same way, but they were given every second day some bread, containing nine grains of the carbonate of iron. The animals were killed after the lapse of five months. The first set were healthy; the second set had tubercles in the lungs or other parts of the body; while the third set remained completely free from any trace of tubercle. M. Coster assures us that he has performed similar experiments on dogs, chickens, &c., and invariably found that the bread containing iron, prevented the formation of tubercles."*

275. Such vigor may be imparted not only to ordinary functions of secretion, &c., but more especially to the absorbent apparatus, that tubercles, wens, and even cancers, may be uprooted and eliminated from the system. No medical remedy heretofore in use has in so many different ages, and by so many eminent surgeons, been in equal estimation for the removal of cancers.†

* Provincial Med. and Surg. Jour.

† See Cooper's Surgical Dictionary.

276. The article has, chemically, no solvent power, nor does it impart any such property to the blood; but such energy is imparted to the absorbents either by the vital stimulation of the excess of globules, or by the demand produced by abstraction or diminution of albumen, that they are made, as it were, to eat up the solid morbid masses. (129-131.)

277. I scarcely need say to the practitioner of medicine, that this energy and vigor of action, is not to be excited in all cases, nor at all times in any case, with impunity. On the contrary, I have sometimes, in phthisis, watched for weeks with the most anxious care, before I could seize a propitious opportunity for administering it; and even when I thought I had ascertained the proper moment, I have sometimes had the mortification to discover that my anxiety had rendered the effort premature and injurious.

278. This class of remedies is never admissible during the existence of pain, irritation, or active ulceration of the lungs. For, in such cases as in energetic action from any other cause, irritative action is determined more especially to the diseased or weakest part. For the same reason it is inadmissible when there is irritation or ulceration of the alimentary canal, or when it is either in a costive or dysenteric condition; and in the advanced stages of phthisis, one or the other of those conditions is so generally present, that we but seldom, and only after considerable preparatory intervals, have opportunity for the use of these remedies. We may frequently force an opportunity by resort to counter-irritation; especially when diverted to the liver, as will presently be more particularly adverted to.

ALKALIES AND NEUTRAL SALTS.

279. Alkalies are of ancient repute as remedies in consumption. Their antiacid and resolvent qualities entitle them to consideration independently of their more imposing character of constituents of the blood. Many reputable practitioners seem to have had considerable success in treatment of phthisis with different preparations of potassa and soda; which they generally ascribe to the solvent qualities of such remedies. This quality they unquestionably possess. A small portion of either soda or potassa—for instance from 10 to 20 per cent.—prevents the coagulation of serum, at a temperature of 212 degrees; and a solution of soda or potassa, more promptly dissolves tubercles than any other of the menstrua which I have tried. Such is also the case with coagulated albumen. As fluids are more easily taken up by the absorbents than solids, this trait in the *modus operandi* is of considerable consequence; provided, a baneful tendency to putrefaction should not at the same time be imparted to the dissolved mass. To determine this matter, I instituted the following experiments:

280. *Experiments with Serum.* August 3d. To six vials, each containing $\frac{3}{4}$ ss of serum of healthy blood, the following salts were added. They were all immersed in boiling water at the same time, and in the same vessel, to a depth greater than that of the serum in the vials, and taken out at the expiration of four minutes:

To No. 1, Was added muriate of soda, grs. 24; sulph potassa, 3 1-2. Result—slightly thickened.

No 2. Muriate of soda, grs. 48; sulph potassa, 7.

Result—a clot the size of a filbert.

- No. 3. The compound of saline ingredients of the blood, in the healthy proportions. Result—perfectly coagulated.
- No. 4. Muriate of soda, grs. 96. Result—turbid, whitish, but perfectly fluid; when cold, slightly gelatinous.
- No. 5. Carb. soda, grs. 24. Result—perfectly fluid; assumes straw color.
- No. 6. Unmixed serum. Result—coagulated, but less solid than No. 3.

Similar experiments were varied to a considerable extent, with an eventuation to about the same import. The addition of 10 per cent. or more of soda or potassa, constantly prevented coagulation.

281. Portions of the mixtures, treated as above, coagulated and uncoagulated, were corked up, and set by to undergo process of putrefaction. Those mixed with the alkalies putrefied first, except when the proportion of alkali was sufficient to convert the mass into soap; the unmixed, next; those treated with salines equal to those ingredients in the blood, next; those with a considerable excess of the saline ingredients of the blood, and those with muriate of soda exceeding 10 per cent., remained unputrefied at the expiration of 20 days.

282. *Experiment with Tubercles.* August 20th. Put 3 portions of clean tubercles, in different stages of development, divided indiscriminately, into vials. Added to each, serum of tuberculous blood, to an amount equal to the bulk of tubercles. Into No. 1, was put 1-8 the bulk of the tubercles, of muriate of soda. To No. 2, the same proportion of carb. soda. To No. 3, no addition. Putrefactive process commenced between 24 and 48 hours soonest, in No. 2,

the alkaline; next, in No. 3, the unmixed; from No. 1, there issued odor of sulphuretted hydrogen; but without the offensive putridity of the others, for 15 days.

On Sept. 4th, fifteenth day of the experiment, a quantity of pure water was added, and afterwards poured off to facilitate an examination of the debris.

No. 1. Debris nearly equal to the original bulk of the tubercles, but changed to a brown color; some of the tubercles still entire, but soft and pasty. The few drops of water which remained, were turbid, with lively, white, mealy-looking particles.

No. 2. Debris flocculent and shreddy, and amounting to less than 1-20 of the original bulk of the tubercles.

No. 3. Debris putrid, black, slimy, and flaky; amounting to about 1-10 of the bulk of the tubercles.

283. I cannot conceive it possible that a sufficiency of those salts can be brought in contact with tubercles through the circulation, to effect chemically either the softening or the putrefaction. But if practicable thus to cause the softening, these experiments shew, that there probably would be cotemporaneous putrefaction. When aware of the terribly deleterious effects of the absorption of putrid matter, (217,) it should admonish us to be extremely cautious about attempting to promote softening by medical means, unless we could be very sure of ability to do it, without, at the same time, effecting the putrefaction of the tubercles.

284. Tubercles in their sound and ordinary condition, have been known to remain 40 years in the tissues of the body, (118,) without producing greater disturbance than the deposition of so much adipose matter would have done in the same situations; a

period which, although the absorption of solids is acknowledged to be more difficult than that of fluids, (128-129,) affords ample time for its accomplishment in this manner. With due diligence, however, one-fortieth part of that time will generally suffice for its accomplishment.

285. When softening occurs we have, along with it, all the terrible concomitants of the last stages of phthisis, with their necessary consequences, ulcerations and excavations of the lungs. (214.)

286. If the softening of tubercles is a desirable event; whatever will be productive of inflammatory action in their site, I am satisfied from observation of the effects of catarrh, pneumonia, &c., will be found a certain resource.

287. The alkalies also possess considerable sorbefacient and deobstruent virtues. The known efficacy of the liquor potassa, in promoting the absorption and elimination of a common bile, entitles this preparation to especial consideration.

Dr. Campbell, of Marylabone, in a recent treatise on phthisis, reports himself to have been more than usually successful. His reliance seems to have been almost exclusively upon this.

288. The property of preventing coagulation of albumen gives to carb. soda importance, perhaps, in character of a preventive. But independently of either solvent or sorbefacient properties, the alkalies are valuable for neutralizing acidity in the stomach, allaying neuralgic irritation, lessening viscosity of mucous, and facilitating expectoration.

289. The carbonate of ammonia, either alone, or in combination with camphor, or with quinine, is

among our most valuable remedies to mitigate hectic fever.

NEUTRAL SALTS.

390. Sulph. soda, sulph. potassa, sulph. magnesia, muriate soda, either singly or in combination, are anti-irritant, diuretic and diaphoretic; and are admirably adapted to tranquilize irritable conditions of the system. When there is constipation of the bowels, they constitute the most appropriate laxatives; and a combination of them, with the addition of a few grains of carb. soda, or potassa, will be found to operate more kindly and efficaciously than four times the quantity of any one of them singly, and with a less degree of nausea.

291. When intended as anti-irritant, I sometimes compound powders, in suitable doses, of the same descriptions of salts as those contained in the blood, and in nearly the same relative proportions. I have often found them decidedly more tranquilizing than any others; and never less so, if the patient was informed of the model of their composition; and why should we not thus, in offering physical relief, also "minister to a mind diseased?" Laennec relates to us one of the strongest possible examples of the baneful influence of the depressing passions; and why not e converso? But moreover, I am myself by no means entirely satisfied of the mere ideality of the matter: for we find the ingredients in the waters of some of those mineral springs most celebrated for their soothing, anti-irritant, diaphoretic and diuretic effects,

bearing a most striking analogy, in their proportions, to the mineral constituents of the blood. Their relative value is, probably, somewhat in proportion to this approximation.

292. *President's Spring*. Saratoga, for example, which comes nearer than any other, either in Europe or America, the analysis of which I have met with, contains minerals about in the following relative proportions:

Carb. iron,	-	-	-	1	} parts.
— soda,	-	-	-	3	
— lime,	-	-	-	18	
Muriate soda,	-	-	-	22	

293. The mineral constituents of the blood are about in the following proportions:

Iron,	-	-	-	1	} parts.
Soda,	-	-	-	2 1-2	
Earthy matters,	-	-	-	1	
Sulp. potassa,	-	-	-	1-2	
Muriate soda and potassa,	-	-	-	9 1-2	

But it may be remarked that the most soothing waters are not necessarily the most efficaciously medicinal. Invalids in anæmia seem to require more powerful stimulation than the constituents of healthy blood can impart through the digestive organs; else the flesh of healthy animals would contain all they required. (238.)

294. *The Congress Spring*, at Saratoga, for example, is the most celebrated in all this mineral region for medicinal virtues. Its proportions are about as follows:

Carb. iron,	-	-	-	1	} parts.
— magnesia,	-	-	-	1-2	
— lime,	-	-	-	27	
— Soda,	-	-	-	2 1-2	
Muriate soda,	-	-	-	78	

The medicinal predominancy here, is in muriate of soda.

295. The parts above stated, taken as grains, would constitute the ingredients in about three glasses of water. Yet we are informed that two or three glasses will operate gently on the bowels, prove moderately diuretic, and promote palpable and pleasant diaphoresis and improvement of appetite and digestion.

296. At such places, those who are satisfied with moderate, sometimes invisible effects, in a moderate period of time, pretty constantly derive benefit and recover their health. While the impatient, those who must have visible operation, use the water much too freely, and are almost as constantly injured and consequently grow worse.

This is especially the case with hypochondriacs and with the consumptive; those to whose diseases harsh means are, of all others, the least adapted. They will not be made to comprehend that the alimentary canal is nature's inlet; not her outlet of the body. They have made it a sewer, until they have harassed it into production of disease of the body, and seem intent on continuing it, until the body is destroyed. Were such not the case with the tuberculous, were they not too intent upon, and impatient for, palpable effects, waters thus constituted, and thus acting, could not but be beneficial. The modus operandi of this water, best

adapted to the elimination of such diseases, would necessarily be the diaphoretic and diuretic, which should not be urged to a degree greatly exceeding the natural action.

COMMON SALT.

297. "*The Salt of the Earth.*" *Nature's Remedy.* Of all the articles of the materia medica, or of commerce, this is probably the most valuable in tubercular diseases. In all ages research has been encouraged and prosecuted in quest of a specific for phthisis. Such researches have generally been directed to the vegetable kingdom in distant regions, on the general principle, I presume, of preference to things most remote, and most difficult to procure.

The absurdity of this, I conceive, a small degree of reflection might have exposed to view. For the cure of a disease so all-pervading, if the beneficent Creator had vouchsafed aught in character of a specific, it might readily have been conceived it would be bestowed to an extent commensurate with that of the prevalence of the malady; but, as far as I am aware, there is no vegetable production which can be propagated throughout even two entire zones of our earth, while the malady pervades the whole of it, and involves the whole of the human race. *Nature's remedy* for consumption, if furnished at all, should be as common as accessible, and as pervading as her remedy for thirst. Nor could it reasonably be supposed, inasmuch as the malady is alike common to man and beast, that He whose justice and mercy as much regards the sparrow as the eagle, would leave recourse

to such remedy dependant either upon arts of commerce, or exercise of intellectual discrimination; or, in other words, exclusively for the benefit of man. On the contrary, a general instinctive relish for the specific, should rather be expected to have been implanted along with the necessity for it. The pathology of phthisis precludes all prospect of the discovery of an absolute specific for its cure; but of all known medicines, common salt most nearly approximates the character and prerequisites for such an article.

SALT is found universally distributed over the earth; and most animals have an instinctive relish for it, and are found, when in a wild state, travelling vast distances in quest of it. When it is attained, they seem to take it only as a medicine, not as a luxury.

298. Domestic animals, when it is made a rarity to them, by too long intervals of privation, often on gaining access, injure themselves by taking too much. With a knowledge of this, extensive graziers in some parts of Virginia, fix large troughs in their pastures, and empty into one an entire sack of salt at a time. They have observed, that with this method less salt is consumed, and that their cattle thrive better. It has also been remarked, that some of the healthiest cattle will not visit the trough for weeks together; but those which have their bowels disordered with diarrhœa, may be observed to visit it several times a day, until relieved. The class of animals constituting an exception as to the instinctive relish for salt, is significant of its curative adaptation. It embraces the exclusively carnivorous, *and none others*—the class least subject to tuberculous disorders; and, in the wild state, probably entirely exempt from them.

299. The relish for salt seems almost as instinctive among the human race as with animals; especially in children; and I have pretty constantly remarked that those of strumous diathesis use it with the greatest avidity. So strong is the appetite sometimes for it that nurses are at great trouble in watching them, lest they might be injured by the indulgence of the craving. I have experienced difficulty in such cases; sometimes inability to satisfy mothers that the indulgence should be tolerated; especially if they were able to inform me that, with all their vigilance, the child had several times stolen opportunities, and had eaten until made sick.

300. Tuberculous children who have not this avidity, rarely recover. They commonly have morbid cravings for clay, chalk, &c.

301. My attention was directed to the remedial efficacy of salt, at an early period of life. When a school-boy, in 1806, I boarded with a gentleman who was deeply consumptive. His physicians, who were eminent, extended to him no prospect of more than a possibility of protracting his existence a few years. It was the first case of phthisis I had ever noticed; and the pale, ghastly countenance, the bloodless lips, copious expectoration, and frequent hæmoptysis, were impressive circumstances, and excited in my mind an interest in all that was done to, or by the individual. About his medical treatment I knew nothing, only, that from it there was no expectation of a cure. But his avidity for salt was most strikingly remarkable; he ate it with every thing, meats, vegetables, and condiments; with it he whitened the surface of bacon, beets, pickles, and other things to which it is not

usually applied. When in his fields he carried dried beef in his pocket, and chipped it off to chew like tobacco between meals.

The habit was reprobated; his friends admonished him, that it would "dry up his blood;"* but he ate on, said he liked it and it agreed with him. This was the only circumstance at all remarkable either in his habits or dieting; and he perfectly recovered. He remained through life remarkably lean, but in the enjoyment of more than ordinarily good health, and without a symptom of phthisis. He died suddenly in 1840, aged 58; the disease unknown.

302. Muriate of soda, as a medicine, is a perfect Proteus. We have seen from analysis, that it constitutes about 9 parts per 1000 of the blood, or nearly 5 per cent. of its solids; a proportion exceeding that of all its other mineral constituents, collectively. A due portion of it, therefore, would seem indispensable as an article of diet. When taken as a medicine the variety of its effects is remarkable. In small doses it acts as a stimulant, tonic, anthelmintic, and anti-irritant; in large doses, as a purgative and an emetic; it is also an astringent and a styptic; and when excessively used it becomes a most powerful sorbefacient. It is, in fact, an astringent in diarrhœa, a purgative in constipation, a tonic, an emetic, a stimulant, an anti-irritant, a styptic in hæmoptysis, and the cause of fatal hæmorrhage in scurvy.

* The popular apprehension of the free use of salt, and the common remark, so truly characteristic of the actual *modus operandi*, diminishing the relative proportion of serum, are very probably traditionary from our forefathers of the 16th or 17th century; amongst whom the predominant morbid tendency was to the scorbutic diathesis. (323-326.)

303. The sorbefacient efficacy of salt we see exemplified in its action, when applied locally in form of poultice, or brine, in the removal of wens and other adventitious matters from the tissues of the body. Its efficacy in the removal or destruction of bots, grubs, and other albuminous intestinal entozoa, incident to horses, is of general notoriety; and its efficacy as a vermifuge for children, and their avidity for it when thus afflicted, have also been remarked;* but less than it merits to have been.

Liebig† has observed, "That the fattening of an animal is rendered impossible when we add to its food an excess of salt, although short of the quantity required to produce a purgative effect." From this, it would seem inimical to *all adventitious animal matters*; and comparatively even more to albuminous than to adipose; for, its most remarkable sorbefacient efficacy is manifested in scurvy; in which, even when there is absorption of *natural albuminous tissues*, to the production of great ulcers; the persons afflicted are sometimes observed to remain fat.

That scurvy is consequent upon a change effected by salt, in the composition of the blood, rests not upon me to prove. The fact has been long established. Boerhaave, and even Cullen, and others, the stoutest champions of exclusive solidism, make this disease an exception to the rule, and ascribe scurvy, emphatically, to saline condition of the blood. Scorbutic disorders are especially characterized by morbid *absorption* of the *solids* of the body. Being in this directly the

remark, so truly characteristic of the actual morbus operarii, diminishing the relative proportion of serum, are very probably traceable from our forefathers of the 16th or 17th century.

* Chapman's Therapeutics.

† Liebig's Animal Chemistry.

antipodes of phthisis, which essentially consists in morbid *deposits of solids* in the tissues of the body. And the natural functions of *absorption* and nutrition, alias *deposition*, are those by which the entire body is made and unmade; and by which, in the progress of life, it is so infinitely changed, modelled and remodelled.

304. All these pathological and physiological facts have been long established, as well as the fact that the excessive use of salt is the general exciting cause of scurvy.

305. But the important corolary, that it must therefore be curative of an opposite condition, has been strangely overlooked.

306. Both diseases,—scurvy and consumption,—on all hands, are ascribed to degeneration of the blood; of which they exhibit intrinsic evidences.

307. In scurvy, the degeneration essentially consists in *excessive* abnormal proportion of *globulous* and *mineral*; and in *deficient fibrinous* and *albuminous* constituents. (61.)

308. In this diseased condition, nature's effort to restore equilibrium is manifested in the scorbutic absorption of the albuminous tissues,* and in the hæmorrhagic effusion of the globules of the blood.

309. In consumption the degeneration essentially consists in *deficient globulous* and *mineral*, and in *excessive* abnormal proportion of *fibrinous* and *albuminous* constituents. (63.)

* The skin and vasicular and cellular tissues are constituted principally of *albumen*; and those are the tissues principally absorbed in scorbutic ulceration.

310. In this condition nature's restorative effort at equilibrium is manifested in the tuberculous effusion of albumen,* and in imparting increased fibrinous character to the crassamentum, to arrest hæmorrhage from the tuberculous ulcerations.

311. The lesion of the blood in scurvy is caused by living too exclusively on salty, nutritious, or stimulating diet;† and is cured by resort to succulent vegetables, acid fruits, &c.

312. On the other hand, the lesion of the blood incident to consumption, is that which is found to arise from the use of insufficient, innutritious, and succulent diet; or from weak digestion. Why should not a change of regimen alter this condition as well as the other?

313. To the cure of consumption a prerequisite is, removal of the tubercular depositions. This can be effected by absorption and excretion, or by ulceration and expectoration: the former, on all accounts, to be preferred.

314. *Now we find exposure to the contingencies productive of scurvy, both causing excessive absorption, and actually curing consumption.*

315. No observation in relation to the disease has been more common or better established, than that long sea voyages cure consumption, especially if productive of scurvy in the crew. An example of the kind is offered in the following extract from the Med. Chir. Rev., for June, 1824:

* Tubercles are essentially *albuminous*.

† Exclusively animal food and alcoholic beverages, seem also to produce scurvy. (328-340.)

“In the year 1722, His Majesty’s ship *Leander*, sailed from Trincomalu for the Cape of Good Hope, taking on board the mechanics of the dock-yard establishment, then reduced on the island. There were also embarked twenty-six invalids, and all the sick that could be removed from the hospital. These invalids and sick were principally affected with chronic hepatitis, dysentery and phthisis pulmonalis, all of which (even some who were expectorating large quantities of purulent matter) recovered on the passage to the Cape.

“This good fortune was counterbalanced by scurvy, which broke out among the crew, and in spite of large quantities of lemon juice, plentifully administered, in conjunction with every other antiscorbutic which the ship could produce, spread to an alarming extent, and in one case proved fatal.

“Had they not reached the Cape at the time that they did, the *Leander* would have presented as deplorable a spectacle as the *Anson* at Juan Fernandez, notwithstanding the supposed specific, *lemon juice*, which in no instance on board the *Leander* had the slightest effect in even checking the ravages of the scurvy. Immediately after the ship reached the Cape, and the crew got plenty of fresh *animal* food, in conjunction with vegetables, they rapidly recovered. Specimens of the lemon juice were transmitted to the Victualing Board, and carefully analyzed in London. It was found perfectly good.”

316. It appears from this, that while salt, ship-store diet, is continued, even lemon acid, the specific, is insufficient to counteract the scorbutic degeneration, as well as that the circumstances productive of

this are curative of phthisis; and meat seems to have been one of the restoratives. (330-332.)

317. The morbid activity to which the absorbents become excited, by long exposure to the irritation of scorbutic degeneration,* causes the removal not only of tubercles and adventitious structures, but also of the natural structures. In this the new formed tissues suffer first, until, as has been before adverted to, (134,) cicatrices and callus's are removed; and wounds healed up for 50 years have been opened as if newly inflicted, and broken bones long knit have been dis-united.†

318. This morbid absorption, which thus carries every thing before it, cannot be attributed to the stimulation of salt, "per se;" but must be owing to the effect upon the peculiar constitution of the blood incident to scurvy, (61,) which salt produces to a degree unequalled by any other known article. The globulous degeneration, however induced, will be found thus incompatible with the tubercular diathesis, and consequently curative of consumption. (272-273.)

319. I am aware that those cures are not generally thus accounted for. And that many able physicians have satisfied themselves that the cure is effected by the pure sea air, and the exercise of sailing. That those things are advantageous is unquestionable; inasmuch as they are calculated to invigorate the system, which we see by the increased color in the complexion of those who exercise in the pure air, an effect produced by the increase of the red globules of the blood.

* The scorbutic, alias globulous.

† Lord Anson's Voyages.

320. But it happens, singularly enough, that several authors of the highest rank in the science, whose works are text-books in the profession, are found within the same volume, ascribing, in one chapter, the cure of consumption in such cases to the *pure sea air* and the salubrious *exercise* of sailing; and in another ascribing the accession of scurvy to *bad provisions, bad air, and want of exercise*.*

321. Predicated on such hypotheses, patients have been put upon the fruitless expedients of short voyages, as in Europe for example, from Calais to Dover, or from Liverpool to Florence—to and fro; which, if prosecuted to an amount in time and distance equal to that of a long voyage, it was supposed, would be productive of like curative results. The futility and utter failure of all such expedients, should long since have set such speculations at rest.

322. The facts in the case when they come to be properly appreciated, will offer much more comfortable, more easily attainable, and withal, better adapted conclusions. For, I conceive, on investigation by those who can procure better materials for such research than I have access to, it will be found that the

* A large proportion of our authorities contain accounts of cures from sea voyages, perverted in the statement somewhat in this manner: The following is from Dr. Rush, (speaking of cures:) "One of these says he was the son of a farmer in New Jersey, who was sent to sea as a last resource for a consumption. Soon after he left the American shore, he was taken up by a British cruiser, and compelled to share in all the duties and hardships of a common sailor. After serving in this capacity for twenty-two months, he made his escape, and landed at Boston; from whence he travelled on foot to his father's house, (nearly four hundred miles,) where he arrived in perfect health." This cure he ascribes to the walk from Boston,

scorbutic diathesis is as incongruous to, and as curative of phthisis on land as at sea; and that the same manner of living will as readily produce the same result in the one situation as in the other.

323. We have the assurance of credible medical record that scurvy "was endemic two centuries ago in all the north of Europe," and that it became gradually less frequent as agriculture and horticulture improved.*

324. Huxam speaks of it in England in his time. He remarks that it was common with fishermen and tradesmen, and seldom met with in agricultural laborers, who drink cider and eat vegetables and fruits. All the writers of those times point to the latter part of winter, and early part of spring, as the seasons in which scurvy prevailed most: the periods for the use of salt meats and of scarcity of vegetables.

325. English history of the same period informs us that agriculture was but little attended to, being superseded by attention to grazing. Cattle and sheep were fattened on grass in summer, and in autumn the inhabitants killed and salted away their years supply of meat, which would seem to have been subsequently eaten without vegetables, or nearly so; for, "it was not," says Hume, "till the end of the reign (of Henry VIII.) that any salads, or other edible roots, were produced in England. The little of these vegetables that was used, was formerly imported from Holland and Flanders. Queen Catharine, when she wanted a salad, was obliged to despatch a messenger there on purpose."

326. In this state of affairs the fare throughout

* Library of Practical Medicine.

the country must have been pretty much on a par with sea-store diet. Whilst such were the habits of the English people, *scurvy was their scourge*. But up to a much later period, we have the high authority of Sir Gilbert Blane, that it prevailed most fatally, especially among the maritime portion of the population; amongst whom he estimated it to have been productive of greater mortality than all other diseases, including maritime accidents and the horrors of warfare.

327. During the whole of the scorbutic reign, *phthisis* seems not even to have been a notable disease. Yet among the same race of people who have only so far changed their habits of living as to have come to esteem succulent vegetables essential to subsistence, and to prefer meats in their fresh and succulent, to their cured condition; the character of *scurvy* has become but matter of history, while consumption has become the *scourge of the nation*—the cause of one-fourth of all the deaths that occur amongst the whole population.

ANIMAL FOOD.

328. It is a matter of common observation, that persons who subsist chiefly on meats are more ruddy and athletic, and become more vigorous both in body and mind, than those who subsist on vegetables and decoctions, or what is termed more delicate fare.

329. Persons who are addicted to the use of rich and stimulating diet, especially of animal food, are observed to become plethoric, florid, and peculiarly liable to gout, apoplexy and hæmorrhage. The blood in these diseases, it must be recollected, is rich, thick

and globulous; and deficient in proportion of serum; consequently antipodal to chlorosis and phthisis. (63-160.)

330. Kramer informs us that the German soldiers, among whom scurvy produced great mortality in Hungary, ate no *salt beef or pork*, but had plenty of *fresh meat*. The same occurrence is reported to have been observed on several occasions among British, Russian and French soldiers;—all of those were either restricted in, or were entirely without vegetables.*

331. This is a singular disclosure. It may be easily comprehended, that inasmuch as the flesh of a healthy animal is constituted exclusively from its blood, and is of the same ingredients, and in the same proportions, differing the one from the other not materially more than does ice from water, that the flesh of a healthy animal would furnish a supply in due proportions of all that was requisite to constitute healthy blood; and also that as man is in his nature omnivorous, such food exclusively, would be too rich a diet. But that it could be competent in any moderate length of time, to produce in the blood the extreme morbid condition of scurvy, is both singular and problematical. Those soldiers, I apprehend, must have sprinkled salt over their fresh meat, a circumstance which the chronicler has not thought worth taking account of.

332. Various intelligent sea-faring gentlemen with whom I have conversed relative to sea-scurvy, have concurred in representing *fresh meat* as one of the most efficient *restoratives*, no less than in esteeming *raw salt meat* most productive of the disease; *fried*

* Library of Practical Medicine.

and broiled but little less so, if any; and *boiled* the least so. What other difference is here produced by cookery but that of the abstraction of salt by soaking? Some who have made long voyages with crews who were allowed to fry or cook as they pleased, represent them to have been terribly harassed by scurvy; but on making the same voyage with crews required to use boiled meat exclusively, no case of scurvy would occur.

333. That fresh meat alone is competent to increase the globules, enrich the blood, and produce tendency to gout, apoplexy, perchance even to scurvy, and to the prevention of tubercles, we have other evidences.

334. Aldrovandi has found that beasts and birds of prey, especially the hawk, are subject to gouty concretions;* and it is matter of general observation among naturalists, that carnivorous animals are less subject to tubercles than others. It is considered by many doubtful, indeed, whether in their free and wild condition these animals are at all subject to tubercles.

335. It is matter too of common observation, that women live more delicately than men, and consume a less proportion of meat; though I think it doubtful whether as a condiment they consume any less salt. Yet we find them less subject to gout, their blood less rich in globules, and more serous, (54;) and M. Louis has found them in the proportion of about 9 to 7 more liable to phthisis than men. Native Hindoos, too, who live essentially on vegetables, are in a great degree more liable to consumption than Europeans. (549.) Among many other evidences that those conditions

* Med. Chi. Rev.

are owing to the mode of living, "M. Magindi," says Andral, "by changing the food of different animals, has made the urine and bile of some of the carnivorous species resemble those fluids in the herbivorous."*

337. Gibbon tells us that Attila, the renowned leader of the Huns, ate nothing but meat. This man's very voice became carnivorous to such a degree that his growl caused the population of Europe to tremble, as herbivorous herds do at the roar of the lion. *He died of hæmorrhage.*

338. The above and other important considerations, concur in pointing out meat as appropriate diet in phthisis. It more enriches the blood, and presents to the digestive apparatus an aliment containing in exactly the healthy proportions, all the constituents that the blood requires. It affords more nutriment in proportion to bulk than any other, and is easier of digestion and assimilation. Being in fact identical in composition with blood it requires no more elaborate digestive process than that of simple solution. "To determine what substances are capable of affording nourishment," says Liebig, "it is only necessary to ascertain the composition of the food, and to compare it with that of the ingredients of the blood."†

This comparison, with animal food, is such as would entitle its use to analogy with transfusion: A process from which, if benefit could be expected in any disease, it would seem to promise it in consumption or hæmorrhage; between the subjects of which reciprocal transfusion would materially improve the composition of the blood in each.

* Andral's Anatomy.

† Animal Chemistry.

339. The use of meat, like all other prescriptions of medicines and diets, must necessarily be regulated by the particular character, period, and condition of the case; of which the attending physician must judge. But as a general maxim, meat I conceive to be unquestionably the appropriate diet, and the dark meats the best.

ALCOHOL.

340. Alcohol, and all the beverages which contain it, are of well-known efficacy in the production of red globules in the blood. The flushed countenance, inflamed eye, and red, bottle-nose of the inebriate, afford external evidence of the predominant constituent produced in the blood; and the offensive breath, the spongy gums, and extremities covered with vibices, often manifest the diseases to which the condition tends; of which apoplexy is the most frequent: and I have myself met with several well-marked cases of scurvy which seemed to owe their origin to this. One of them especially, occurred in an individual who used much less meat in his family than ordinary, and was considered the smallest meat-eater among them; and who in answer to my inquiries, assured me that he used not more than the usual quantity of salt as a condiment. He was covered with vibices, and had several successive hæmorrhages from the gums, which were near proving fatal.

341. Dr. Cowan, in his remarks on the influence of the trade of steel-polishing, at Sheffield, which so uniformly and in so short a time produces phthisis, remarks: "It is an interesting though painful obser-

vation, that the most dissipated workmen live the longest.”*

342. In my early practice the use of alcoholic beverages and animal food, was my chief dependance; and was mainly instrumental in effecting several cures. There has been no instance among them of resort to such beverages having proved the cause of the production of a drunkard.

343. Some of my patients thus treated have, on the contrary, in the course of its prosecution, taken a distaste, first to one liquor and then to another, until, before the diathesis satisfactorily changed, they became disgusted with the whole routine of spirits, wines and malt liquors; and have ever since retained this antipathy, thinking of such liquors with the nausea incident to thoughts of medicines.

344. As adjuvants to preceding articles, alcoholic beverages may, in most cases, be used with decided benefit, particularly in the debilitated period, which accompanies or follows coughing in the morning, in the apirexia of hectic fever; and in convalescence, with a view to the change of diathesis.

345. But the alcoholic, are, on several accounts, probably the least eligible of any of those alterants of the blood which have been considered:

1st, Because they are not found as natural constituents in the blood.

2d, Because for this reason, their alterative effect must be a result of morbid action, as well from the beginning up to the elaboration of the natural proportion of globules, as thereafter.

* Cowan's Appendix to Louis of Phthisis.

3d, Because there is danger of engendering a pernicious habit.

IODINE.

346. The efficacy of this article, both as a sorbent and a deobstruent, is unquestionable and well established. For the cure of goitre, for the removal of excrescences, and the resolution and restoration of enlarged glands, it is unrivalled. It has also been successfully applied to the reduction of obesity, and when injudiciously or unskilfully used, has induced marasmus. Baudelogue, Lugol, and many other eminent physicians of Europe, report it equally efficient in tuberculous as in other tumors. I have used it in goitre and in cases of enlarged spleen and liver, with results as satisfactory as any ascribed to it; but in tubercular disease I never have had a patient with whom, by any manner of management, I could get it to agree, internally administered; and when applied externally it has done mischief. Satisfied that, if manageable, it presented the qualities of a most efficient remedy, I varied my modes of application; and among others caused it to be inhaled. Used in this way it was more efficient, less irritating, and better borne, than in any other that I have tried. Thus applied it was in some cases strikingly beneficial; in others decidedly injurious. The most striking benefit, and the most remarkable result I witnessed, were in the case above related. (257.)

347. In another case, in the second stage of phthisis, on the fourth day of inhaling, several vomices were ruptured within the period of less than

twelve hours;* the profuse discharge produced great dyspnœa and prostration, and it was more than a week till recovery from the effect was experienced. A similar degree of versatility has attended the use of it in other cases. Upon the whole I have been rather favorably impressed by the results. When enabled more perfectly to regulate and adapt it by the advantages of farther experience, I anticipate in the possession of this a valuable accessory to treatment. Used by inhalation it seems unirritating to the system, and comes not in conflict with other alimentary remedies of known efficacy, which are better understood. My method for inhaling is to put a few drachms of iodine into a small vial, and suspend it about the neck like an amulet. Cork and uncork the vial as more or less of the vapor is desired.

MERCURY.

348. The sorbefacient and deobstruent virtues of mercury are too familiarly known to require any illustration in this place. If in combination with those, it possessed the tonic virtue, it might be entitled to a standing as a remedy in tubercle as imposing as that it has attained in syphilis. Or if it even were but negative, not decidedly debilitating to the system, the tonic defect might be remedied or overlooked. But even as it is, if judiciously managed it may be rendered productive of as much benefit in phthisis as it has been of horrible injury in a great many other diseases.

* This occurrence may have been independent of the iodine.

349. Mercury in its operation has a greater effect upon the liver and less upon the lungs than on most other parts of the body. Which enables us to make advantageous diversions of diseased action from one to the other.

350. When inflammatory action exists about tubercles in the lungs, producing pains in the upper part of the chest, febrile action in the system, and difficult expectoration; a state commonly marked by clean, moist, red tongue; one or two grains of calomel administered three or four times a day, will generally in from 24 to 72 hours, so irritate the liver as to produce secretion of greenish bile. With this occurrence, and sometimes even preceding the evidences of such decided action, the tongue loses its fiery color and becomes flurred at the root; the fever abates, and the pain shifts from the upper to the lower part of the chest, [the region of the liver,] and the cough ceases to be troublesome. An interval is thus afforded in which we may resort to chalybeates or other tonics, without danger of their reflecting irritation upon the lungs: the mercurial irritation of the liver having rendered this temporarily the weaker and more assailable point.

351. There seems a peculiar propriety too in the selection of this, as a point of counter irritation, as the liver seems more especially to be connected in morbid action with an opposite diathesis, the arthritic; it being often the receptacle of calculi and gouty concretions, and but very rarely of tubercle. On the contrary, it is in tubercular diseases generally found, as it were, *fattening* on the waste and devastation that surrounds it, and suffering but little functional disturbance.

352. When the mercurial action begins to subside the pains are frequently found returning to their original seat, and the cough becomes increased in proportion to the recurrence. In this event the chalybeates should be discontinued and the mercury resumed. These variations I have, in some cases, had to practice very frequently before tonics could be continuously borne; and in others in which I know not by what other process I could ever have brought the system to bear them at all.

353. When there is, in phthisis, deficient biliary secretion, the restoration is more promptly effected by small doses of calomel than by any other means. If the condition is accompanied by diarrhœa or dysenteric symptoms, the addition of Dover's powder, with a little more than the ordinary portion of opium, amends the condition, and at the same time conduces to absorption and excretion: matters which never should be overlooked in the selection of any adjuvant remedies. As a general rule let every thing used, whether palliative or otherwise, be selected with an eye to the indications for the radical cure of the consumption.

354. Corrosive chloride of mercury, in combination with muriate of ammonia, the ancient salt of wisdom, in spirituous or aqueous solution, is a most effective and valuable wash in cases complicated with aphthous irruption, or chronic ulceration of the fauces or epiglottis.

ANTIMONY.

355. Antimony is productive of various important

operations upon the system, according to the amount and the manner in which it is exhibited, we find it acting as an alterant, diaphoretic, diuretic, expectorant, sorbefacient, purgative and emetic. Its general action is that of a sedative upon the circulating system, while at the same time it is conducive to the increase of all the secretions. It acts with peculiar felicity in combination with various articles of the *materia medica*: with mercury as an alterant and emulgent; with opium as an alterant and diaphoretic; and most happily restraining diarrhoea without irritation to the system, by effecting vicarious action of the skin.

356. In Europe many physicians, especially in Italy and France, of late years have used it with unusual success as an anti-irritant and sorbefacient, in inflammation of the chest and lungs; also in acute rheumatism, hydrocephalus and apoplexy.

357. I have found it of great use, on the above principle, in allaying that irritation of the lungs which is so very incident to them, and to their pleuritic covering in the second, the ulcerative stage of phthisis, which so often puts us at a stand in the application of our tonics and other requisites in treatment. With antimony combined with calomel this is generally speedily allayed. Antimony has, in an eminent degree, several of the curative prerequisites for the removal of phthisis; but fails in the most important of them all—the tonic.

358. But it is as an emetic that antimony is most especially prized. Emetics have been recommended in phthisis from a very remote period, in the annals of medicine; and their efficacy has been

attested at nearly every epoch by some of the highest authorities which have graced the profession. Their views of the *modus operandi* were various: some ascribing their efficacy to the promotion of digestion by cleansing and changing the action of the stomach; others to emulging the liver and the regulation of the biliary secretion; others to removal of pulmonary congestion by equalizing the circulation of the blood; others to ejecting pus, phlegm, or tuberculous matter from the lungs; others simply as followers of high authorities seem to have commenced and then continued them on account of their success.

359. With all those various views they pretty generally concur in commending their efficacy, and report a greater or less number of cures, which they mainly attribute to this part of the treatment. The emetic articles used have been as various as the theories on which their use has been predicated: as squill, ipecac, tart. antimony, sulph. cupri, sulph. hydrarg, sulph. zinci, &c. But the preponderance in authority and in numbers of cures reported, is decidedly in favor of antimony; which is, therefore, as well as on account of intrinsic qualities, selected as our subject of observation. One European physician reports no less than 176 cures in less than four years, which he ascribes mainly to the efficacy of this article.

360. The relation is so momentous that were it even presented by less elevated authority, it is worthy of being extracted entire, as given by Sir James Clark, physician to Her Majesty, Queen Victoria; and who, it is to be presumed, would not have introduced Dr. Giovanni into such company as that of his circle, were he not entitled to at least a decent share of credibility:

“The most recent and extensive experiments with emetics,” says he, “are those by Dr. Giovanni de Vittis, chief physician to the military hospitals of the Neapolitan army. In the military hospital at Capua, where the greater number of phthisical patients of the army are sent, antimonial emetics were tried in every case. From the first of May, 1828, to the 8th of January, 1832, there were sent out of the hospital perfectly cured, ‘*perfeltemente guariti*,’ forty cases of chronic catarrh, forty-seven of phthisis in the first state, one hundred and two of the second, and twenty-seven of the third; making a total of two hundred and sixteen cures: one hundred and seventy-six of which were cases of phthisis. The mode of treatment consisted in giving every morning and evening, a table-spoon full of a solution containing three grains of tartarized antimony in five ounces of infusion of elder-flowers, and one ounce of syrup. A second spoon full of the emetic mixture was given at the end of a quarter of an hour, when the first dose did not produce vomiting. The patients were at the same time put upon a light, farinaceous diet, composed chiefly of rice, chocolate and biscuits. If the antimony excited brisk purging, it was omitted for some days, and roasted ipecac and digitalis, which are said to produce wonderful effects in curing this diarrhœa, were administered in doses of a grain each, and repeated every hour or oftener, until the diarrhœa ceased. Although we may be permitted to question the permanency of all the cures, especially of those in the advanced stage, we cannot doubt but the practice must generally have produced very beneficial effects.”*

* Clark on Pulmonary Consumption.

361. Antimonial emetics have their advocates with us, too, who, though fewer in number, are not less illustrious in fame. It is to the efficacy of antimonial emetics that professor Dudley mainly ascribes his pre-eminent success in treatment of tuberculous diseases, as disclosed in the following letter, which he kindly permits me thus to use:

“DEAR SIR: Yours of the 15th inst. was received a few days ago asking for the results of my experience in the use of antimonials for the cure of certain diseases. It is now nearly thirty years since I began to use tartar emetic freely in my practice; and while it has never in any one instance been followed by permanently injurious effects, its administration in many of the most appalling forms of disease, such as have resisted all the new remedies lately introduced into the materia medica; as well as others that have long been familiarly known, has been followed by most signal success. Cases apparently of the most aggravated stages of tubercular consumption have been perfectly relieved by it. But yet I could not suppose that its effects would be permanently beneficial in cases of this description, except when under its administration, the system was enabled to throw off the disorganized tubercles.

“Great reliance is placed upon the effects of this article in many other forms of disease, and not without entire conviction of its superior efficacy to other remedies that have been in more general use; but which, nevertheless, have proven their entire inefficacy. In the practice of physic, as in many of the arts, the public mind must be prepared to render innovations successful. Prejudice must give place to reason, and

experience furnish materials for correct medical philosophy, before the approbation of the community can be enlisted in behalf of new doctrines and new practice in physic, where the object is to enlarge the field of knowledge in reference to the virtues of a familiar agent. I feel disinclined to recite particular cases in which the efficacy of tartar emetic has been witnessed, because of the vast variety of circumstances under which patients may be found, having the tendency to render the operation of the article more problematical. But when a correct philosophy is established, and cases are adduced in evidence of its utility in the practice, skepticism is quiet, and a rational credulity follows. I have the honor to be, with great respect, very sincerely yours,

B. DUDLEY.

“LEXINGTON, July 22d, 1842.

“Dr. WM. A. McDOWELL, Louisville, Ky.”

362. My own estimation of the efficacy of emetics is high, but so very far in arrear of that of Dr. Giovanni, that it shrinks from comparison. My estimation of emetic treatment in phthisis has reference chiefly to the second stage of the disease; to their efficacy in ejecting softened tuberculous matter, from vomicae; and I have used them with no other view; except occasionally to emulge the liver, to unload the stomach, or sometimes to anticipate febrile paroxisms.

363. When there are regular paroxisms of hectic fever, in consequence of accumulation of softened, ulcerative, tuberculous matter in the lungs, which is producing exhaustion by the excessive irritation and wasting sweats, much relief and both a saving of strength and of vital power, may be effected by dis-

gorging the accumulation of the night by the administration of an emetic in the morning. The source of febrile irritation is thus ejected at once, and the emetic operation which effects it, generally exhausts less than would the long coughing requisite for its discharge.

364. This discharge is generally pretty effectually accomplished by emetics, provided the fistulous communication between the vomica and the bronchia is sufficiently large to admit the passage of tolerably sized curds of tubercle. Otherwise, the emptying is not likely to be effected; and in failure of this, no benefit is derived while the emetic injures by exhausting the body. The retained acrid matter excites the hectic paroxysm as usual, and the wasted strength offers only a less degree of resistance to its ravages. In this way at least, I would account for the injury I have observed my patients to sustain from vomiting, when no tuberculous matter was ejected.

366. When, on the contrary, the softened accumulation is found to have been cast up, no hectic paroxysm will ensue that day. When from those vomicae good sized lumps of tubercle are passing by expectoration, the hectic often may be thus cut short, and by administering an emetic every day or two we may succeed in preventing its recurrence during the entire period of the emptying of the cavern; by which, besides thus shortening the process of emptying, we are enabled to prosecute tonic and sorbefacient treatment with advantage, even during its continuance; and enjoy the advantages of removal by absorption and by expectoration at the same time.

EXTERNAL APPLICATIONS.

367. During the whole course of treatment, we may use with much advantage various external applications, either in furtherance of medicines internally exhibited, or as substitutes, in cases in which the stomach is not in a condition to receive or retain medicine.

BATHS.

368. Phthisis essentially consists in the accumulation of solid animal matter in the tissues of the lungs, which compresses the bronchiæ, impairs the vesicular apparatus and materially interferes with the respiratory functions. In view of this, when we reflect on the violent disturbance in the vascular system, and the derangement of organic action, which is produced by temporarily breathing a medium that decarbonizes the blood insufficiently, we can have no difficulty in appreciating a remedy, that may be brought in aid of the process of respiration.

The skin is known from experiment, moderately to participate in the decarbonization of the blood. This is sometimes evinced by the change of color which blood undergoes in ecchymosis; becoming more and more florid the longer it remains in the fluid state beneath the skin; and this effect we see very much increased by moistening the surface. By some physiologists this is ascribed to the moisture rendering the skin more pervious to oxygen of the air; a conclusion

certainly most unnecessarily far-fetched,* when it is notorious that the moistening medium (the water) contains a greater portion of oxygen than the air, and imparts it more readily, as familiarly exemplified by its more rapid oxydation of metals, and by observation of the comparatively diminutive organs which suffice for the decarbonization of the blood of aquatic animals.

369. The above considerations, together with the ordinary febrifuge influence upon the temperature, renders the bath a most efficient as well as a luxurious auxiliary. Keeping in view the well known efficacy of sea bathing in scrofula, will admonish us of the advantage that may be derived from making the bath water equally salt with that of the sea—about one pound of salt to thirty of water. Baths should be of such temperature as is most pleasant to the patient.

370. In case of inability or of inconvenience to submerge, the body may be frequently sponged, moistened, or well rubbed with water saturated with salt.

371. Brandy saturated with salt, has had its day in the annals of empiricism as a specific in consumption. The real efficacy of this, to some degree, is very probable; both ingredients tend to the production of the scorbutic diathesis. But independently of this, it furnishes a ready and a neat mode of applying stimulation, if the system should require it, when the state of the stomach cannot bear the internal exhibition of such remedies.

372. In cases exhibiting deficient biliary secretion

* And bad philosophy—for water notoriously renders porous media less pervious to air.

under similar circumstances, Dr. Scott's nitro-muriatic bath may be often resorted to with advantage.

BLISTERS.

373. "Of two pains at one time, not possessing the same place, that which is more vehement, diminishes the sense of the pain of the other."* This principle of revulsion has been recognized and variously practised at every period we have knowledge of, from the age of Hippocrates to the present day. It has, over and over, been brought up under one disguise or another, and presented as the basis of some new theory. It is of the essence of Mr. Hunter's incompatibility of diseased actions with one another, and of Hanneman's *similia similibus*.

374. Revulsion is effected in various ways and by various agents, internal as well as external. Of the latter, I have considered the blister by cantharides as decidedly the most eligible of all the local applications of the class; especially in most of the diseases incident to the chest, arising from deposits or effusions; not only in their character of revulsives, but also as powerfully exciting the functions of absorption. I have frequently seen large accumulations of pus absorbed in the course of a few days, from swelled joints (white swellings,) by the application of large blisters; and the excretion effected without material disturbance to the system.

375. With this view blisters may be advantageous-

* Hippocrates, App. XLVI.

ly applied in the early stages of consumption, especially whenever any degree of pain in the chest is experienced. Absorption is promoted, and the pain and its cause, inflammatory action, are determined to the external surface, while the danger of decomposition and softening of tubercles from inflammatory disturbance, is averted.

376. This kind of revulsion too, is eminently calculated to allay irritation, which may arise from catarrhal, bronchitic pneumonic and pleuritic complications.

377. For all these purposes, the axillary or the inter-scapular regions,* are decidedly the most eligible situations for the application of the blister; being the only points of immediate intercommunication between the lungs and the external tissues.

378. When designed to act sympathetically, the application should be to the point, or near it, to which the diversion is desired to be made.

379. If the complication seems to have arisen from suppression of catamenia or of leucorrhœa, the application should be to the *sarcum*, or to the inside of the thighs; and if practicable, the leucorrhœa should be re-established.

380. If from rheumatic metastasis, the blister should be applied to the joint or part whence this had retroceded.

381. If the object is merely to effect revulsion to the surface, and there are objections to the spine or *axillæ*, it matters but little where it is applied, except

*A plaster one inch in breadth and nine or ten in length extending from the neck down the spine, first on one side of the spinous ridge and then on the other, alternately.

that it would prove more efficacious, if within the limits of the distribution of the respiratory nerves.

382. On the occurrence of the second stage of phthisis, whenever a tubercle or a mass softens, the ulcerative inflammation attendant upon the process is productive of more or less pain, and generally produces adhesion of the lung to the costal pleura by interposition of false membrane. In most constitutions the suffering from such pains may be very much mitigated by the application of small blisters, to act directly through the false membrane. It can but seldom be requisite, that the magnitude of the blister in such cases, should exceed the size of a pistercen or half a crown. As, in ordinary cases, vomica require but from four to six days to disgorge, *no more durable issue than a common blister, is desirable.* The next which softens, may be some inches apart from this, or even on the opposite side, and will indicate a new point for the revulsive application.

EMBROCATIONS.

383. Embrocations are frequently prescribed as a means of counter irritation, by production of pustular eruption or inflammation of the surface. They are more troublesome and less efficacious than the blister; and if extended over a large surface, stop up the pores and too much interfere with the perspiratory excretion.

FRICTION.

384. Friction performed with a flesh brush or with a soft hand, is both luxurious and healthful, it removes obstructions from the pores of the skin, elicits a moderately increased flow of the blood into its structures, and is productive of increased perspiratory excretion.

FLANNELS.

385. Flannel worn in contact with the skin keeps up perpetual gentle friction, from the number of points it presents to its surface, owing to the short fibre of the material of which it is constructed. This often proves highly efficacious for the relief of pleuritic, pneumonic, bronchial and catarrhal complications. The effect is so striking and important, that it may be considered as decidedly medicinal.

386. Considered as medicinal, it becomes questionable whether the indiscriminate and general use of flannel in this country is not productive of injury.

387. The habitual and long continued use of it, I conceive, must be productive of one of two injurious effects.

1st, The continued unnatural or excessive action kept up in the skin, must after awhile become productive of disorder of function or of organ;—or,

2d, The habitude must come to be such, that it ceases to be productive of medicinal or excessive action.

388. In the first of these cases, the injury is serious. In the second, the efficacy of an inestimable remedy in time of need, is lost.

389. If proper to wear flannel in summer at all, which is questionable, there should be made at least a proportionate reduction of other clothing; and, in fact, the thinnest flannel alone is as much or more than should be worn by the tuberculous invalid at this season. If worn in addition to other or ordinary clothing, it must necessarily subject the wearer to the debilitating influence which would be incident to a climate farther south, to a degree equal to the increased artificial heat from the flannel, independently of the other malign influences heretofore and hereafter alluded to. (608.)

BLOOD-LETTING.

390. In a disease, in the morbid anatomy of which a remarkable diminution of the total mass of the blood constitutes a characteristic,* blood-letting should under any circumstances be considered a hazardous practice; and more especially when it is considered that the mass, diminished as it is, is constituted of excess in the proportion of serum.

391. In this situation, if the mass must be reduced, would it not be better to effect it by discharging the serum by diuretics, sudorifics, or cathartics,—if such means as these, even could be justifiable in a disease which is farther characterized by excessive sweats and colliquative diarrhœa, so wasting the already diminished watery blood, as to cause the melting down and emaciation of the solids of the body to supply the deficit, and prevent collapse of the vascular system. (91.)

* Demonstrated by Portal, Lieutaud, Bartholon, &c.

392. Blood cannot be drawn without abstracting all of its component parts, and indeed observations of M. Andral and others, show that the greatest proportionate loss sustained is in the globules, the richness and strength of the blood; which, however desirable and restorative to natural proportions, in gout or apoplexy, is ruinously the reverse in chlorosis or phthisis.

393. "A single bleeding," says Andral, "and low diet, even during a day or two, will be found to have a marked influence in lowering the proportion of the red globules."

394. Messrs. Prevost and Dumas, after having bled a cat largely, found its blood to consist of 791 water, 87 albumen, and 118 of globules. In the course of 7 minutes, two more bleedings were taken. The last one exhibited water 829, albumen 77, globules 93. Loss of proportion in globules 25, in albumen 10, increase in water 38.

395. The globules when lost are difficult and slow of reproduction, and can be restored, it would seem, only by digestive elaboration—a feeble operation with the characteristically morbid digestive apparatus of the tuberculous—while the serum, as we see, may be supplied by the solution and at the expense of the solids. (91.)

396. The "hæmatosin," says Dr. Babington, "is the least destructible of all the elements of the blood, retaining its qualities in that fluid after having been kept for several years, when lost by hemorrhages, it is of difficult and slow reproduction, as is evident from

the fact, that when excessive, such persons remain exsanguine for many years." *

397. Nevertheless, in acute phthisis, accruing in persons of full habit, we may encounter cases exhibiting such exalted arterial action that the measure may become essential. But in any event the step should be duly considered and cautiously taken.

399. EMETICS. See antimony.

PURGATIVES.

400. Purgatives are as much as possible to be avoided. Nothing should be done to hurry the aliment out of the alimentary canal before digestive elaboration is completed, or that might endanger the inversion of the lymphatics, and the wasting of this fluid; for the production of which the solids have been dissolved and wasted.† (91.) But to prevent the spontaneous occurrence of this event, the most successful expedient is, to keep the bowels gently moved every day with unirritating laxatives; for, diarrhœa is found generally to alternate with constipation; and if the irritation from the latter is averted, the former, as a consequence, is prevented.

EXPECTORANTS.

401. Expectorants act in two ways: 1st, by increasing the vigor of the capillary circulation in the lungs, and thereby promoting mucous secretion. 2d, by relaxing those vessels and favoring exhalation.

* Babington on Morbid Conditions of the Blood. Cyclopædia of Anat. and Physiol.

† Sir George Baker reports that Dr. Blanchard "had seen the consumption brought on ten persons out of ninety, by excessive purging used to prepare the body for the small pox.—(*Rush's Medical Inquiries.*)

402. Either of these consequences is calculated to operate injuriously in phthisis. As congestion, from whatever cause arising, is calculated to accelerate the tuberculous deposition by furnishing more material for its production; and to endanger the disorganization and softening of tubercles already there.

403. The expectorative effort incumbent upon the lungs for the removal of tuberculous matter, is generally as onerous as they can bear without great exhaustion to the system; and every thing that will add to this should be avoided. When there is difficulty in ejecting the expectoration, it will generally be found owing to some complication which promotes secretion or exhalation, either making the sputa difficult to get up by rendering it viscid and adhesive from secretion of mucous, or by greatly increasing the quantity of exhalation, as occurs towards the fatal termination, or as ensues from the use of a relaxing expectorant. Either effect, whether of medicinal or accidental occurrence, is always detrimental, and never should be promoted. In case of difficulty from viscidness, the inhaling of vapor from warm water or vinegar, repeated doses of soda or potash, and counter irritation by a blister to the spine, are our most eligible means of relief. In the second, the exhalation from debility, alcoholic, diffusible stimulants, stimulating baths to the feet, and blisters to the chest, are effective.

SUDORIFICS.

404. Sudorifics, strictly speaking, are but rarely admissible in phthisis; if by the term sudorific we are to understand that which produces sweating or aque-

ous excretion from the skin. In this degree the process is to be looked upon as a lesion of perspiration, and is productive of waste of the circulating fluid, which, as heretofore shewn, must be reinstated at the expense of the solids.

405. Healthy perspiratory secretion, is in form of a gaseous halitus; and whenever producing more than a softness, or a very slight impression of moisture, is to be considered in excess of the natural function. The continuance or encouragement of such excesses presently is followed by reaction; and we may come even to have colliquative sweats by neglecting or by encouraging such irregularities, and regular disordered function of the skin, when its most healthy and most powerful action is so much needed. Whereas, by strict attention to the matter, by gradually stimulating the function by some such tonic diaphoretics as heretofore treated of, augmenting little by little, abating on production of aqueous exudation; and, after a time, progressing again, keeping the organ somewhat excited, but avoiding decided excess, we bring it by habitude to bear more and more, and instead of being weakened, the organ, like other organs of the body, becomes strengthened by exercise.

406. Sudorifics in phthisis can only be useful in averting catarrhal, pleuritic, dysenteric, or rheumatic complications; and even for those, should be resorted to with caution.

DIURETICS.

407. Diuretics may often be used with benefit, especially if perspiration is deficient, when, by increasing the activity of the kidneys, they may be made instrumental by vicarious action in removing from the blood impurities which are usually eliminated from the skin.

TONICS.

408. This is the class of medicines which is mainly to be relied upon; but the diseased condition of the stomach and alimentary canal, constitutes so common a complication of phthisis, that on this account we frequently find them to be inadmissible; and in the very cases, too, in which constitutional indications most require them. In such cases an interval of diminished irritation should be vigilantly watched for, and the earliest safe opportunity should be embraced for their administration. Especial care should be taken on such occasions to select those tonics best adapted to the period and existing state of the case. If chalybeates are admissible, they should be preferred on account of their direct and established tendency to promote production of hæmotine; but if too irritating, select some one of these which may be supposed to combine most of the qualities of sorbefacient, deobstruent, and alterant, with those of the tonic. Among them I would enumerate, next to those especially treated of heretofore, OXYDE OF BISMUTH, SARSAPARILLA, PRUNUS VIRGINIANNA, and GEUTIAN.

But let the selection be what it may, great caution should be exercised in commencing any tonic course. Sometimes without manifestations of any such tendency, the most moderate exhibition of tonics will be productive of the most violent nervous or organic irritation. Yet those, of all others, are the cases in which tonics are most needed. With such, when we shall have succeeded in getting them to be borne, we should commence cautiously, and be vigilant and circumspect in the prosecution.

SYMPTOMS AND COMPLICATIONS.

HÆMOPTYSIS.

409. This is one of the most alarming of the symptoms in phthisis; but it is actually alarming only, because, when it occurs as a symptom of *phthisis*, it indicates the arrival of the second stage of the disease, the decomposition of tubercles and their *irruption* into the bronchiæ, although their existence may not have been before suspected. In such cases the hæmorrhage is generally of no manner of consequence, rarely amounting to more than from a speck or a streak, to a tea-spoon full. When even more free than this, it is generally in consequence of more than usual congestion about the vomica; and in such cases the local discharge is often advantageous; when blood-letting in any other manner, or from any other point, would be totally inadmissible.

410. Occurrences of the kind require no treatment; yet they are frequently the cause of most active and ruinous measures.

411. Hæmoptysis is of frequent occurrence without having any connection with phthisis, or with the tuberculous diathesis, being a mere vicarious discharge which is almost as frequent an occurrence from this part of the mucous membrane as from that of the nose, the stomach, or the bladder; and of but little more real consequence. Yet I have become acquainted with the history of many such cases in which copious and repeated bleedings have so far impoverished the blood and exhausted its globules, as to become productive of tubercular degeneration—contrary to nature, and even in defiance of a decidedly adverse diathesis.

412. In pneumonia, pleurisy, or bronchitis, as well as in phthisis, the occurrence of hæmoptysis is symptomatic of local congestion, and is favorable to its relief. The loss of a little blood from a congested part, wherever seated in the body, is better borne than a general bleeding, and affords more relief.

413. There is no condition of the system which, in case of hæmoptysis, can demand venesection, that would not equally demand the measure independently of it.

414. A varicose condition of pulmonary vessels, and rupture from this cause, or the destruction by ulcerative erosion of a considerable vessel traversing a cavern, will sometimes occur in phthisis. In such cases the most approved treatment consists in large doses of sugar of lead, or muriate of soda. In

cases of the kind I have ascribed more benefit to the application of ligatures around the upper parts of the thighs and arms, made tight enough to impede the return of the blood to the lungs, than to any other expedient.

415. But certainly it would seem in such cases unreasonable to resort to blood-letting, when the whole apprehension of danger is from loss of blood. Yet it has been my lot sometimes to have found this a favorite resource.

CATARRH AND BRONCHITIS.

416. In the progress of phthisis generally the most troublesome and harassing complications we encounter, are catarrh and bronchitis. The weak condition of the lungs subjects them to catarrhal irritation from the most inconsiderable atmospheric variations; and each accession of the kind demands the suspension or modification of our tubercular treatment.

417. Catarrhal attacks may generally be cut short in their onset without much difficulty, by the administration of a full saline cathartic; to be checked after one or two operations by the exhibition of a sudorific, composed of equal parts tinct. opii. and vin. antimo. Catarrh, if not promptly treated, is liable to become chronic, or to degenerate into bronchitis.

418. Cough is but seldom a troublesome symptom in uncomplicated consumption; rarely exceeding a degree that is more than sufficient to effect the necessary expectoration. It is chiefly by complications that our treatment is interrupted, and our curative efforts are paralyzed.

419. The frequent interruptions from catarrh sometimes are succeeded by the more abiding and more troublesome complication of chronic and sub-acute bronchitis; harassing with incessant cough by day, and making the sleep unrefreshing by night; and putting a stop to efficient measures for the removal of tubercles.

420. The best treatment which I have resorted to in chronic bronchitis consists in the use of balsamic mixtures,* and the application of blisters to the spine, a plaster one inch in breadth and nine or ten in length, applied from the lower joint of the neck down the spine, first on one side of the spinous processes then on the other successively, until the complication is removed.

421. If the bronchitis has been from metastasis of leucorrhœa or gleet; reproduction of the original disease should be attempted by resort to stimulating injections, or by the application of blisters to the neighboring surfaces. In very obstinately chronic cases, those measures by way of revulsion sometimes prove highly efficacious.

PNEUMONIA.

422. This seems to me to be an exceedingly common complication; though no where adverted to as such. On my first examination of patients who have

* ℞ Balsam capiava ℥ii:
 Gum Arabic ℥ii:
 Tinct. opii ℥i:
 Spts. terebinth ℥ss:
 Aqua ferv ℥iii:
 M ft solutio.

A tea-spoon full to be taken three times a day.

been in the second stage of the disease, I have but rarely failed to detect some degree of crepitus in the tuberculated region. Such cases are farther distinguishable by more than ordinarily viscid expectoration and harassing cough. The hectic fever is more acute, the tongue is unusually moist, smooth and red, and pain or soreness in the affected region is greater than common.

423. In this condition no tonic or sorbefacient is admissible; the prosecution of any efficient treatment of phthisis must await its removal. The morbid tendency is to its increase, every accession of catarrh, however slight, aggravates it, and nearly every breeze is productive of catarrh.

424. This harassing complication is generally promptly relieved by counter irritation made by disordering the liver with successive small doses of calomel. One or two grains administered three or four times a day, will, in the space of from one to three days, generally be found to have changed the alvine evacuations from the natural to a greenish color. With the change there occurs pain in the region of the liver, and symptoms of moderate hepatitis; and on their accession all the symptoms of pulmonary inflammation vanish, or are greatly mitigated. The pain, the cough, and sometimes the fever, cease. The tongue becomes natural in color and furred at the root; and the system will be found in condition for the prosecution of efficient treatment of the main disease. Under such treatment the onus of irritative action, which may be engendered by tonics or sorbefacients, determines to the liver: this having been rendered the weaker point. And, for the same reason, all catarrhal

and other diseases of casual occurrence, are thereto directed; for, "disease, like a skilful general, always assails the weakest point."

425. As the mercurial irritation subsides, the pneumonic symptoms are liable to recur; and I have known them thus to alternate from one to half a dozen times; but by like treatment the degree may be more and more mitigated at each recurrence. The following is the best formula:

℞ Calomel ℥i:

Tart. antimo. grs. i:

Opii grs. iii:

Sach. alb. ℥i:

M ft pulv 10.

One to be taken four times a day.

Although my prescription very often is from one to two grains of calomel alone.

126. PLEURITIC COMPLICATIONS. See blisters.

ULCERATIONS OF THE GLOTTIS AND EPIGLOTTIS, WITH HOARSENESS AND LOSS OF VOICE.

427. *Hoarseness and loss of voice* are not unfrequently consequences of a merely neuralgic affection of the glottis, or of muscular debility from over action in speaking or singing. In such cases no dangerous consequences are to be apprehended;—but when a consequence of ulceration and in connexion with phthisis, there is no more evil-omened symptom.

428. These ulcers are the effects of unusually erosive character of the sputa, and indicate an inordinate degree of malignity in the character of the disease. Such ulcerations are considered by M. Louis

to be "peculiar to phthisis." Their existence is indicated by "a fixed pain in the upper part of, or immediately above the thynoid cartilage, with some difficulty in swallowing, and the return of liquids by the nose, while the pharinx and tonsils remain healthy." * Sometimes those ulcerations are attended with no other symptoms, but fixed pain at the upper part of the thyroid cartilage.

429. Our most available resources in treatment, consist in blisters, rubefacients and inhalations. Frictions with croton oil, or small blisters over the part, or along the course of the recurrent nerves: inhaling vapour of warm water, of balm tea, or of vinegar; or the smoke of Jamestown weed, or of night-shade, frequently afford relief. With curative intention, fumes of iodine, dust of powdered alum, or of sulphate of copper, or of sanguinaria may be occasionally inhaled.

HECTIC FEVER.

430. The hectic fever in phthisis, I conceive is generally a consequence of the absorption of the putrid matter of softened tubercles. (217.) Consequently, for this, the cure must consist in preventing such absorption:

1st, By removing or preventing those occurrences which we find condusive to the softening.

2d, By furthering and promoting the discharge of the matter when softened.

431. We find the softening accelerated by catarrh,

* Louis on phthisis pulmonalis.

and pneumonia, or by the occurrence of congestion or inflammation from any cause. I have been made more and more cautious in the use of idone, from the impression that it conduced to this effect; it may, however, in such cases, have been only a coincidence.

432. Soda and potassa have softened tubercles, submitted to their action in vials, in considerably less time than those similarly exposed but unmixed, although they underwent the same process; they also putrified sooner. Tubercles, treated at the same time with the common muriate of soda, in the same proportions with the soda and potassa, dissolved in about the same time as those unmixed. They first fell into curdy masses, then into mealy particles; putrification was prevented in these. But this can have little or nothing to do with the process of softening in the lungs, as too little of those articles, I conceive, can be applied to tubercles there through the circulating or lymphatic system, to be productive of chemical action.

433. Efficient treatment would consist: 1st, In preventing congestion or irritation in the lungs about the tubercles by averting the causes; or, on its occurrence by diverting it by counter irritation with blisters, sinapismus, baths, frictions, &c. Or, by irritating neighboring organs, and effecting metastasis, by rendering them weaker and more assailable than the lungs. 2d, When softening has occurred in expediting the discharge by emetics administered every day or two until the vomicae are emptied.

434. The fever, in the mean time, may be mitigated by resort to diffusible stimulants during the remission; of which those, should be preferred, which will determine to the surface, and gently promote perspira-

tion, and stimulate or counter irritate the nervous extremities, such as the pulvis dorerii, or the following, which I consider better:

Tinct. opii. ℥iv.

Vin. antimo. ℥iii.

Spts. nitre dulcis. ℥i

Mix.

60 or 70 drops to be taken at an early period in the intermission, and the dose repeated occasionally, at intervals of from two to four hours during its continuance.

435. An emetic in the interval, if admissible, that is, if there are indications that the fistulous communication between the vomica and the bronchia, is sufficient to admit a free discharge, should precede such treatment.

436. Blisters may be advantageously applied to the surface, especially if necessity for their application is indicated by local pain; all such applications should be made at the *earliest* period of the intermission; or, if necessary, an hour or two previous to its occurrence, so that the whole process of their irritation and vespication, may occur within the apirexia. During the apirexia, stimulating baths of the decoctions of pepper or mustard in spirits or vinegar saturated with salt, may be made to the extremities. On the occurrence of the exacerbation, advantage as well as comfort, may be derived from repeated bathings or spongings of the whole surface, with *pleasantly* cool salt and water.

437. The sweating stage which follows is curative of the paroxysm, and should not be interrupted. With this it is dangerous to tamper; and yet it is so much

and often so pertinaciously tampered with, that I will give it a separate consideration.

COLLIQUATIVE SWEATS.

438. Those sweats are generally the result of the febrile effort of nature to divest the blood of debris and of putrid matter absorbed from vomicae in the lungs. And any successful effort to suppress them, otherwise than by removal of the matter, must necessarily prove injurious.

439. Absorption of putrid matter, whence soever derived, gradually deteriorates the blood, until it becomes an irritant to the capillary exhalents; which causes their spasmodic contraction for its exclusion; as occurs in consequence of inhalation of putrid or miasmatic air; and similarly to the analogous action which occurs in the glottis on attempting to inhale carbonic acid gas.

440. The matter and debris, continuing to be retained, gradually accumulate, and circulation to the surface becomes more and more diminished, until the patient comes to shiver with cold, and, if in great debility, sinks under it. But if there remains sufficient vital energy for the accomplishment of reaction, the heart and arteries become excited by the accumulated irritants, into febrile energy, and the blood is violently propelled to the surface, forcibly injected into the capillaries, pours out the perspiratory fluid loaded with the putridity and debris, and receives through the skin a vicarious supply of oxygen; whereby the blood becomes regenerated as well as purified.

441. The necessity for those sweats, under such circumstances, is manifested by their sour offensive smell; affording the substantial evidence that they are charged with results of putrefactive fermentation. Hectic fever, so far as I am aware, never has been met with, except in cases wherein there are grounds to believe it has originated from some such surcharge. Experimentalists have, indeed, induced analogous febrile paroxysms by introducing putrid matter into the tissues of healthy animals. (172, &c.) Hence it becomes probable, that if we could succeed in stopping those sweats otherwise than by the removal of the cause, instead of benefitting, we should destroy or seriously injure the patient.

442. But, nevertheless, something should be done to sustain the system under such exhausting discharges; and nothing that can benefit in this respect should be omitted. Wines, cordials; light, nutritious broths, and diluent drinks, should be taken; but of all things else, panado, acidulated with wine, and wine whey, should be preferred. This latter especially, is so assimilable with the blood, that it seems readily to replenish the waste, taking the place of the putrid and offensive discharge, to the great benefit of the blood in the exchange.

443. For checking excessive sweats, many and tolerably adverse remedies have been recommended; and after a persevering use for a few days all have succeeded. The two which seem to have enjoyed most celebrity in the catalogue, and which are invested with about equal claims by authorities, are acids and alkalies. Both have proved successful in the hands of various practitioners.

444. It seems to me that in the use of those very adverse articles, more benefit might be derived by discrimination in the cases to which they are applied. When the sweats are profuse and watery, for example, and without the sour and putrid smell, we should probably derive most advantage from the tonic influence of the elixir vitriol, or muriate of iron. But when sour and offensive, it could be better corrected by lime water or soda.

445. I have treated cases without the use of either, and I have used them both; and in both ways methodically and ordinarily; and am aware of but very little if any difference in the result. In from about 2 to 6 days, they stopped the sweats; in other words, by the time softened tubercles had become pretty completely discharged from the vomica in the lungs.

COMPLICATIONS IN THE ALIMENTARY CANAL.

446. *Dyspeptic symptoms.* Those are frequently coeval with the phthisis; sometimes they seem to precede and even to produce it.

447. In such cases the dyspepsia constitutes the primary object of treatment. Upon which I would refer the reader to Dr. Wilson Philips's work on Indigestion, as the best I have ever seen on the subject.

448. For the relief of those troublesome symptoms which constitute so frequent a concomitant, the acidity, epigastric pain, and vomiting, the free use of super. carb. soda will be found the best corrective of the *acidity*. Bathing over the seat of pain with a mixture composed of equal parts spts. turpentine,

sweet oil, and laudanum,"* will generally relieve *pain* and *vomiting*. If not, a blister to the epigastrium, and repeated doses of equal parts of lime water and new milk, will seldom fail.

449. In cases complicated with much ulceration and inflammation of the stomach, more time and skill very often are required and must be devoted to treatment of gastric and intestinal complications, than requisite after they have subsided, to accomplish a cure of the phthisis; and sometimes they prove so utterly intractable that a condition suitable to the treatment of the phthisis can never be attained at all. Even when the extent of the phthisis is moderate, and could be easily removed if the digestive organs could be found in a condition to receive and to elaborate the appropriate remedies and aliments. The mesenteric glands are sometimes so enlarged by the accumulation of tuberculous matter as to compress the lacteals and lymphatics to such a degree as to obstruct the passage of both medicine and nutriment from the alimentary canal to the blood; cutting off all possibility of benefit from treatment, and producing death from starvation. I have treated several cases of this description in which there was ravenous and insatiable appetite to the last, without any indication of nutrition. In a child thus destroyed by mesenteric tubercles, I once found, on dissection, the lungs in an entirely healthy condition, exhibiting not a particle of tuberculous matter.

* Morton's "Illustrations of Pulmonary Consumptions."

DIARRHŒA.

450. Diarrhœa is generally most harassing at an advanced stage of phthisis; but occur when it may, it is one of the most exhausting complications.

451. There is reason to believe that diarrhœa is the effect of a vicarious secretion, an abortive effort of nature thus to discharge impurities, which should have been eliminated by perspiration. This furnishes us the indication to check it by determining to the skin; and the best, though not the strongest remedy, I have used for that purpose, is opium and antimony.* Should this fail, use in addition, injections of solutions of morphia and sugar of lead; if still in default, "a grain of alum with a grain and a half of sulph. of iron, morning and evening," says Dr. Morton, "is a most effectual check to diarrhœa." I have been brought to the necessity of using it, and have found it good. Sometimes a flannel bandage about the abdomen is an admirable auxiliary; if this and the first named prescription can be made to suffice, it will be preferable to a resort to any stronger remedy.

452. Prevention, however, is better than cure; and by using proper precautions the occurrence or recurrence of diarrhœa may generally be prevented; the condition is frequently a consequence of reaction upon

* R̄ Tinct. opii. gts. xxv:
Vin. antimo. gts. xxv:
Spts. n. dulc. gts. v.

To be repeated after each operation until diarrhœa is checked.

a costive habit; the hardened fæces too long retained and impacted, acting upon the diseased and ulcerated intestines as an irritant, become productive of congestive determination. This is averted by carefully keeping the bowels in a soluble condition, by gentle and unirritating means.

DYSENTERY.

453. This complication frequently alternates and sometimes coincides with the diarrhœa, and is indicative of excessive irritation of the intestinal mucous tissue. To this membrane bile seems a natural and essential stimulant, and is perhaps an indispensable antiseptic to matters contained in the alimentary canal. But, be this as it may, deficiency of bile unquestionably aggravates the disorder; and reinstating the secretion relieves it.

454. The addition of mercury to the opium and antimony, recommended in a preceding section, is indicated here as the appropriate treatment.* Antimony in those cases is preferred to ipecac, because believed capable of exercising specific sorbefacient influence in removal of tubercles.

* ℞ Opii. pulv. grs. x:
Tart. antimo. grs. i:
Calomel grs. xvi:
M. ft. pillu. 8.

One every 3 or 4 hours, until dysenteric symptoms are removed.

REGIMEN.—DIETING.

455. It is only through change in the condition of the blood that our treatment becomes conducive to the cure of consumption. And dieting is one of the main and most efficient resources for accomplishing the object: medicines are but co-operatives to this end.

456. The indications are to restore globulous condition, or richness, to weak and serous blood.

457. As the condition of the blood is dependant very much upon the quality of the food from which it is elaborated, to effect this change would seem to require such regimen as is known to be productive of principles in which the blood is defective; and the greatest degree of certainty in the selection would be accomplished by reference to the description of diet which is notoriously productive of those principles in the blood of others, to an excess that amounts to disease of an opposite character. Such diet, for example as would be especially objectionable to the gouty, the apoplectic, and the adipose; that is, the most nutritious and stimulating food which the stomach will bear, without nausea and disgust; and the easiest of digestion that can be procured of that description. Meats and animal broths are more perfectly adapted to this than any other, and when not interdicted by existing irritation, are preferable to every thing else; and to this, by degrees and progressively, as the system can be got to bear it, stimulating beverages and condiments should be added.

458. Changes in dieting should not be over-urged, but be moderately brought up, and especially if the

patient had been upon different food, which is sometimes prescribed; the change should be gradual and rather slowly made, for those reduced conditions bear all violent alterations badly, and a great and sudden change, even from bad to proper treatment, may prove fatal.

459. If, for example, the patient is on an exquisitely low diet, such as would be proper for an apoplectic subject, change it little by little, until he is brought to bear a milk diet. This may be considered the medium, the perfectly healthy standard and model of all dieting; but the tubercular diathesis has a descending tendency, and should be raised above this enough to make allowance for *slips*. And, moreover, the digestive power of this diathesis is generally too weak to elaborate healthy or sufficiently rich and globulous blood, from a merely healthy aliment. Hence the necessity for such as is conducive to an opposite diathesis. Their milk should be gradually made richer and richer by the addition of cream. Next broths and white meats should be given; then dark meats; then, pretty exclusively, meat and bread, with stimulating condiments; and at length, if need be, meats well salted, without bread.

460. Any excess in eating should be most strenuously avoided. There should not at any time be as much taken at a meal as is usual in health, nor more than four meals a day. The quantity eaten should be restricted to an allowance that would be perfectly digested; for, any surplus would speedily ferment, evolve gas, inflate the stomach and bowels, create fever, and totally interrupt nutritive elaboration, and

perhaps disgust the patient with the prescribed and appropriate diet.

461. There never should be eaten enough at any time entirely to satisfy the appetite, however diminutive may be the quantity craved; nor should a forced morsel *ever* be swallowed.

462. At the earliest and nicest period in dieting, the appetite is sometimes so fastidious that to prescribe an especial article engenders antipathy and disgust to it; it is placing it as it were on the medical list. This is so often the case, and appropriate diet is so vitally important, that it is generally best only to indicate a class of articles, and this should be as extensive and varied as the character of the case will admit; for, variety in food is epicurean, and is conducive to rich blood.

463. The class of articles having been indicated, the choice among them, and the quantity, would be quite as well regulated generally by the appetite, as by the nicest judgment. For it is worthy of remark, even in repetition, that animals in the wild state, or domestic animals which roam in large pastures and have access to such varieties of food and condiments as accord with their natural demands, and take it at will and pleasure, are much less subject to tubercles, as well as to all other ailments, than such as are stalled, caged, or restrained.

EXERCISE.

464. Exercise has been in all ages considered essential to health, and has been especially recommended to the consumptive. That it is essential I

presume there can be no question; but that most authorities recommend excessive measures of this description, I am as well satisfied, as I am of the inestimable importance of sufficient and appropriate exercise, in all periods of the disease.

465. Exercise should be moderate and regular, and proportionate to the strength of the patient; and if admissible, such as pleasantly engages the mind: dancing, for instance, fencing, farming, gardening, travelling a foot, on horseback, or in a carriage. The modes to be preferred, in the order enumerated, but in whatever manner, to be prosecuted in every instance, to a degree short of fatigue.

466. Dancing or fencing is to be preferred, on account of the necessity each produces for bringing into action all the muscles of the body. In travelling the pedestrian plan is preferred for similar reasons. For dancing, jumping the rope, or spinning on a big wheel, may be advantageously substituted. Some one of those may be most convenient for ladies, whose situation or domestic engagements, may not admit of their travelling. They should be repeated five or six times, or oftener, a day; and although a few steps in the dance, or a few hops over the rope, may comprise the extent of their ability, in their first efforts, yet by perseverance they will often find themselves in a few weeks, able to prosecute it for three or four consecutive hours without fatigue.

467. There are cases in which the character of the exercise should be adapted to the constitutional conformation of the patient. When there is malformation of the chest, such as its being too flat, or sinking or depression of the sternum, exercise with

the "dumb bells," swinging heavy weights in either hand, and striking them together alternately behind and before, would be most appropriate.

468. The effect of this is to drag the anterior portion of the ribs and the sternum upwards and outwards, through the instrumentality of the pectoral muscles; the fibres of which proceed from the sternal portions of all the ribs, and run up, convergent, to be inserted by a common head into the humerus, below the shoulder joint. This furnishes the bone in the exercise the lever power for the elevation of the sternum in each motion. Acting in the backward swing, mechanically, by the tug through the muscular fibres; in the forward one, vitally, by the muscular contraction which is required in the effort.

469. This effect may also be accomplished in jumping the rope, by throwing the rope backwards. The rope should always be handled by the patient; exercise of the arms and pectoral muscles being the important part of the process.

470. By persevering attention to such exercises, I have seen such changes wrought in the course of a few months, that it would be difficult to identify the well-formed chest then presented, with the flat, sunken-breasted, stoop-shouldered thing, with winged scapulas, presented at the beginning.

471. In walking for healthful exercise, the free, easy, natural swing, should be given to the arms; if not even a little more. The artificial and more fashionable manner of walking with the arms pinioned by the sides like a strutting soldier on parade, deprives the practicer of the better half of the benefit of walking.

472. The well-known benefit which is derived from long voyages should admonish us that violent or harsh exercise, is not demanded: no exercise is more gentle than that of sailing.

473. Exercise never should be to a degree that materially hurries the circulation through the lungs, choked up, as they are, with deposits of solid matter; their respiratory functions are at all times impeded, and when hurried, by determining the impure blood too rapidly upon them, it is liable to pass insufficiently decarbonized, and to irritate and disorder other organs of the system. *Excessive exercise*, I am disposed to believe is one of the most *injurious* and most common *errors in the treatment of phthisis*.

SUMMARY.

474. In treatment of consumption, I have endeavored to prove that our views should be directed mainly to correct the degeneration of the blood.

475. I have also endeavored to establish the fact that this potent, vital stimulant, when in its purity, and constituted of its natural principles in due proportions, is competent to excite the natural functions to the removal of all ordinary obstacles to regular and healthy action.

476. Evidences have been adduced to prove that changes may be effected in the blood, by which the important functions of absorption and nutrition, the functions by which the system is made and unmade, can be so modified that on one hand solid deposits from the blood may come to be made in the tissues of the body, (tubercles,) and there remain unabsorbed

until they decay and putrefy in the situations they occupy; and that this feeble unstimulating degeneration may proceed still further, until it will not even stimulate the absorbents to the removal of the more easily absorbable principle, water, that comes to be deposited in the tissues, (dropsy,) towards the termination of the disease.

478. While, on the other hand, it may be enriched to so healthy and potent a degree, as to stimulate to the absorption and removal of all such deposits, and even to the more difficult removal of foreign and inert matter. By farther urging an opposite degeneration may be produced whereby the absorbents may be stimulated, or rather irritated, into a degree of action so vehement as to take up even the natural tissues themselves, and to devour the body.

479. The production of such change to some degree between the healthy constitution of the blood and this extreme morbid or scorbutic constitution, must be competent to cure any consumption that has not so utterly disorganized the digestive apparatus, or the lungs, as to be destructive of their functional operations.

480. The variable constitution of the blood in different conditions of the body, and the extreme difference it manifests in antipodal diseases; and the difference of the one and the other in opposite directions from the constitution of the healthy blood, have been demonstrated by actual analysis. It has been shown how each, and either the one or the other degeneration, has, over and over, time out of mind, been produced from accidental causes;—and may be again, by medical and diatetic management, at will.

481. And I fain would flatter myself, that consumption has thereby, without undue reference to my own experience in evidence, been as clearly demonstrated to be a curable disease as any other in the therapeutical catalogue.

482. But though curable, it may be seen that this end is attainable by no summary process. Those changes, which may be effected in the blood, are difficult and slow of accomplishment. The important deficiency in which the degeneration principally consists, (the globules,) is the least destructible; and requires the greatest length of time for reproduction of all the constituents of the blood;—and such generally is the delicacy and attenuated condition of the body, that in the beginning, and often for a great length of time in the early period, treatment must be almost inefficiently mild; or the feeble, fluttering, vital spark, will be overwhelmed.

483. He who expects to treat phthisis with success, must adapt his mind to patience and perseverance; his attention to watchfulness and discriminating circumspection; and his means to a slow and unalluring process.

484. We begin with treatment to effect a moderately, but decidedly increased excitement of the excretory process; which should be well established prior to efforts made for the promotion of absorption of tubercles. If absorbed prior to provision for the elimination, they would be liable to be re-deposited as nuclei for tubercles in every part of the system, (189–190;) in which event we should have but unchained a beheaded hydra.

485. Whenever the system is in condition to bear remedies to excite absorption of tubercles, this object should be pushed with all the avidity and energy compatible with the constitution of the patient and the complications of the case. The effects should be watchfully observed, to see that no complication becomes predominant to a degree which may render the process injurious to the strength and constitution. If such is the tendency there should be a timely discontinuance, and attention should be turned to combating the rising complication. This subdued the least possible time should be lost in resuming the main treatment again.

486. In some cases for many months together nine-tenths of our time must be devoted to counteracting complications; hence the importance so often alluded to of meeting them, if admissible, with remedies adapted to promote the leading object.

487. I once treated a case successfully in which, during the first 18 months, the sum of the periods during which regular treatment adapted expressly to the removal of pulmonary tubercles, amounted to less than two consecutive months.

488. The occurrence of hectic is the cause of frequent interruptions, especially in advanced cases. This, it has been shewn, demands a peculiar modification of treatment, and requires to be managed with tact and nicety. While it exists, tonics are admissible only in the apirexia. Vigilance and watchfulness are therefore requisite to anticipate and prevent the hectic, observing the signs of pulmonary irritation which ordinarily precede or cause the softening of

tubercles. The tendency should be allayed by counter-irritants, and such other means as before indicated, before the mischief is effected.

489. Besides these things, externals, baths, frictions, clothing, dieting, exercises, &c., are to be prescribed and minutely attended to. They must of course be modified and varied to suit the especial character of the case, and the peculiarity of the patient's constitution.

491. Neither when tubercles have been entirely removed, with all their concomitant symptoms, will the physician yet have fulfilled his duty, until the diathesis is changed; for, while this continues, any slight disturbance of health, is liable to reproduce the disease.

492. The time necessary for the production of the requisite change of diathesis may be stated at from six months to five or six years—dependent very much on the degree of co-operation of the patient—as well as the degree of degeneration of the blood. Such result is to be effected mainly by appropriate regimen and dieting, to the consideration of which a separate chapter is principally devoted. (Chap. vii.)

493. From June, 1838—the commencement of my practice in Louisville—to January, 1843, 120 cases of tubercular disease were treated, 66 of which presented the diagnostics of the last stage of consumption:—of which 25 died, 70 have been cured, and 25 are still under treatment; twelve of whom are convalescent.

Of the above, 36 cases were attended jointly, or in consultation with one or more of my brethren in the profession. To 39 others, my attendance succeeded to that

of other discriminating and reputable physicians, with whom I coincided in the diagnosis. The tubercular identity of the remainder, rests (professionally) upon my individual diagnostic discrimination.

Of the 25 that died, the loss of several is ascribed to inattention to prescriptions. But a large majority of them, on first examination, presented a condition of the lungs so extensively ulcerated and disorganized and so depraved a state of the general system, as to preclude all hope of any other termination.

494. I know no more familiar or better method of presenting to the reader a view of my method in the combined and alternate application of the various remedies which have been separately considered, than to present in detail the whole treatment of one or more tolerably complicated cases. The following two are offered as, in my estimation, intrinsically the most interesting which have occurred in my practice, and the most widely variant. With respect to complications and process of cure, they may be regarded as about medium cases in duration and variability of treatment.

The first is interesting as being of purely inherent constitutional origin, and presenting complications in its progress, which rendered the diagnosis as unquestionable as a post-mortem examination could have done.

495. The second presents the interesting and more rare complication of, or probably origin in diseased skin; and the troublesome accompaniment of genital derangement, which is by no means an uncommon complication in female cases, and is the *more* interesting on that account though the complexity rarely arises to so harassing a degree, as in this instance.

CASE FIRST.

496. June 21st, 1834, consulted by Mr. —, of Bottetourt county, Virginia, aged 27, of decidedly tuberculous diathesis; spare form, contracted chest, thin white transparent skin, light hair and blue eyes. Consumption has been a common malady in the families both of his paternal and maternal progenitors.

497. *History and Symptoms:*—He gives the following history of his case: he was taken in June, 1833, with shortness of breath and slight cough with expectoration of white frothy sputa. This continued until September, when the sputa became thick and yellow. From 1st of September to 15th of October, had hectic fever and night sweats. This recurred again on the 29th of March, 1834. April 1st, had slight hæmoptysis, followed by expectoration of white curdy matter, floating in thinner matter than he had previously expectorated. This he thinks continued three or four days, then changed to the ordinary sputa; hectic fever abated and sweats ceased about the same time, uncertain whether spontaneous or not. He was under treatment at the time. The hectic fever, sweats, and hæmoptysis, in this succession, recurred on the 12th of May; followed in the course of a day or two, by curdy sputa, which he thinks continued six or seven days, then changed to the ordinary purulent sputa, which, with the hectic fever, has continued to this time. During this period he has occasionally seen curdy matter in the sputa, but not to an amount sufficiently remarkable to fix his attention or to impress the date of the occurrences. He has never ex-

perienced pain, but has constantly slight soreness under the right clavical. Cough is excessive and very harassing. For the last two weeks vomits often through the night, caused, he supposes, by the cough. Fever is moderate; night sweats considerable, tongue moist, clean and very red; bowels costive.

498. *Physical signs.*—Percussion elicits a dull resonance from the right clavicular region, extending as low as the fourth rib, also from the axillary and interscapular regions of the same side: good over the remainder of the chest. Auscultation detects pectoriloquism under the right clavicle. Respiration, cavernous in the same region and crepitant a little below; rather weak and somewhat irregular throughout the rest of the lungs; with slight bronchophonous resonance of the voice at various points.

499. *Prognosis.*—A cavern in the upper right lobe, tubercles below this, with inflammation and effusion about them; bronchial irritation throughout the lungs, and irritation, perhaps, ulceration, of the stomach.

500. *Treatment.*—June 21st—℞ rad. tarax., ℥i rad. sang., ℥i, water ℞iv, boil half away. A gill to be taken four times a day. A blister plaster one inch in breadth and ten in length, to be applied in the left interscapular space at four in the morning, that the vesication may take place within the apyrexia. Elixir vitriol to be taken nightly in warm drink until night sweats abate.

Regimen.—Light animal broths, well seasoned with salt; wine whey for drink exclusively; a salt-water bath every second day.

23d, 24th and 25th—Curdy expectoration, cough moderated, vomiting has ceased.

26th. Cessation of crepitus fever and sweats.

℞ Sulph. Ferri.

Carb. Potassa, aa ζ ss.

M. ft. Pillu 48.

One to be taken three times a day and the dose gradually increased until four are taken at a dose.

29th. Diarrhœa, dejections crude. ℞ cal. grs. ii, pulv. Doverii grs. vi, to be taken every four hours until checked or the discharge becomes green. Chalybeates discontinued.

July 1st. Green dejections, diarrhœa moderated; ℞ Tinct. opii. ζ iv., vin. antimo. ζ iv., spts. nitre dulcis. ζ i., mix; 80 drops to be taken after each dejection until sufficiently restrained; chalybeates resumed.

4th. Cough exasperated; ℞ blister to the right interscapular space.

6th. Cough moderate; expectoration easy; perspiration natural; tongue clean and of natural complexion; bronchophonism lessened; ℞ moderate allowance of animal food.

12th. Bronchophonism absent; other symptoms as above; ℞ full allowance of animal food well salted;* a moderate allowance of wine and porter.

19th. Hectic fever and night sweats; fiery red clean tongue; soreness in the tubercular region. ℞ Calomel grs. ii., opii. grs. 1-4, tart. antimo. grs. 1-8; to be taken every four hours. Chalybeates

* My general prescription of common salt is in form of a condiment, or in some disguised form or combination, careful of giving it a medicinal rank, least the idea might engender distaste.

discontinued; diet reduced to broth; wine whey exclusively for drink.

20th. Symptoms unchanged. ℞ Brandy in the apyrexia on account of weakness and sinking at this period.

21st. Tuberculous expectoration; alvine evacuations greenish; mercury discontinued.

22d. Antimonial emetic, to be repeated daily, in the morning's apyrexia, until the fever ceases.

24th. Diarrhœa; expectoration ordinary purulent; ℞ tinct. opii., vin. antimo. and spts. nitre; emetics discontinued.

26th. Bowels in good condition; fever gone; cough moderate, about as usual in this stage of phthisis; ℞ chalybeates resumed; moderate allowance of meat, to be gradually increased.

August 4th. Tongue coated; appetite defective; night sweats; soreness in the tuberculated region, with crepitant rattle.

℞ Decoct. tarax. comp. every three hours; a blister the size of a dollar over the sore spot; cal. grs. iii., and pulv. Doverii. at going to bed; an emetic at sunrise; chalybeates discontinued; diet reduced to broth; wine whey for drink.

7th. The disturbed functions are all relieved; ℞ chalybeates and meat diet resumed; tinct. tarax. & sang. three or four times a day, in place of the decoction, which had been uninterruptedly continued up to this time.

14th. All the signs and symptoms are manifestly better; strength improves.

30th. A recurrence of the symptoms of the 4th instant; prescription the same.

Sept. 1st. Symptoms unabated; cough aggravated; R. blister to interscapular space.

3d. Cough diminished; curdy expectoration has occurred with moderate degree of fever and sweats; tongue irritated at the point; bowels loose; tendency to diarrhœa; R. cal. and opii. every four hours.

5th. R. an emetic at sunrise.

8th. Condition easy; fever gone; R. chalybeates, dieting, &c., resumed.

16th. Tuberculous expectoration, preceded by moderate hæmoptysis; hectic very slight and unattended with night sweats; R. dieting moderately reduced; no other change of treatment.

22d. Deficient appetite; alvine dejections whitish; R. cal. grs. ii., opii. grs. 1-4, three times a day until passages are dark-yellow or green.

October 31st. Has had no cough during the month, general health good. Dismissed with injunctions to continue the chalybeates, and a diet essentially of salt animal food for from six to twelve months. He became so hearty that this recommendation was neglected in less than one month.

501. *Secondary Tubercles.* A few months after this, he complained of pain of the left side, near the point of connexion of the seventh rib with its sternal cartilage, with symptoms of hepatitis. The hepatitis yielded to treatment, but the pain of the left side continued; and in February, 1835, two tumors became evident at this point.

May 21st. Tumors had become so painful that I made an incision, and turned out two albuminous tumors of the size of a hen's egg, and of the consistency of common cheese. I considered those to be decidedly

tuberculous; prescribed chalybeates; the wounds healed kindly, and my patient again had the appearance of health, and was again as neglectful of prescriptions as before.

502. In the following December, after a short illness, swelling of the lymphatic glands of the neck occurred.

R. Diaphoretics and tonics, with vol liniment externally.

March, 1836. While other tumors were diminishing, one remained stationary, and softened. I opened this and pressed out the whole contents, amounting to more than an ounce of pure tuberculous matter. Prescribed as before; but more especially recommending salt-seasoning and salt-water baths. In the course of the year he became quite hearty and somewhat fleshy; and has ever since enjoyed an ordinary degree of bodily health, exhibiting no tendency whatever to tuberculous disease.

CASE SECOND.

503. *Diathesis and symptoms.* February 20th, 1840. Visited Mrs. ———, of the city of Louisville, aged 32. She has badly proportioned chest, tumid abdomen, limbs as large as the usual proportions, and moderately full habit of body; but the entire flesh, both muscle and adipose matter, is extremely soft, doughy, and non-elastic. The skin is doughy, and irregular in thickness and in density; the extremities œdematous; aspect cadaverous; complexion muddy, of greenish yellow tint; tongue and fauces pale, and covered with aphthæ; has sleepless nights, no appetite,

great flatulency, cough unusually troublesome; expectoration tuberculous; has pain in the left breast, extending through to the spine.

504. *History.* Gives the following history of her case: she has not menstruated for three years, was irregular sometime previous to the stoppage, and during the whole of this period has been troubled with irregular condition of the bowels, generally excessively costive, and this alternating with diarrhœa; the appetite very irregular, sometimes entirely absent, and then again excessive, and often craving strange and unnatural articles; the abdomen generally uneasy, frequently painful, or sore sometimes at one point, sometimes at another; has repeatedly had chills, fevers, and sweats, at various intervals. The aphthous eruption now perceptible in the fauces, has been at times much more extensive and distressing, considerably ulcerating the fauces and disordering the bowels; accompanied with tenesmus and excoriation of the rectum and anus. She had no cough until last March, when she contracted a catarrh; this was but little troublesome, but continued until the last of November. Up to this time, ever since menstruation ceased, she had leucorrhœa. In November this became unusually troublesome, and the aphthous eruption covered the vulva and the visible mucous membrane of the vagina; the leucorrhœal discharge was of a greenish tinge and streaked with blood; attended with irregular secretion of urine, alternately scant and scalding, and then copious, bland and watery. From this distressing condition she was relieved by a prescription which

both cured the local eruption and stopped the leucorrhœa in the course of eight or ten days. Immediately on getting well of this, the cough became greatly aggravated, accompanied with pain in the chest; which has continued ever since. She had observed no tuberculous curds in the sputa until about the middle of January; she thinks they have been present ever since.

Feb. 20. Symptoms are above detailed.

505. *Physical signs.* *Percussion:* Dull resonance from left clavicular, upper interscapular and axillary regions. Clear every where else over the chest. *Auscultation* detects rough cavernous rattle under the left clavicle; resonance of the voice from this part, between that of pectoriloquy and ægophonism; and resonant from the left interscapular space and the right clavicular. In the other regions, at various points, mucous rattle is detected.

506. *Prognosis.* Tubercles in the upper left lobe; a cavern containing fluid under the clavicle of the same side; crude tubercles in upper right lobe. General bronchitis, the consequence, it is believed, of metastasis from the mucous membrane of the vagina; and farther complicated with and having been preceded by abdominal tubercles: (*tabes mesenterica*,) with very much disordered skin. The information elicited does not determine whether this last is to be considered in character of a cause or an effect.

507. *Treatment.* ℞ Decoct. tarax. & sanga., (500,) a gill four times a day; a blister one by nine inches to the left interscapular space at 4 in the morning, an emetic at 7; immersion in a warm salt-water

bath in the evening's pyrexia; bowels to be kept soluble with a compound of neutral salts.*

22d. Cough less harassing; clear pectoriloquy from upper left lobe: decoct. disagrees with the stomach. \mathcal{R} Dose reduced, one-half to be repeated every three hours; warm bath to be repeated daily; thin animal broth well salted for diet; vinegar whey for constant drink.

24th. Cough as bad as at first; for the last two days no tubercle in the sputa; no hectic fever, appetite better. \mathcal{R} Blister to opposite interscapular space; tinct. cantharides to be injected into the vagina morning and evening, with a view to produce local irritation and to restore leucorrhœa.

25th. Cough better, soreness of chest diminished.

27th. Cough more aggravated. \mathcal{R} Introduction into the vagina of a small sponge, saturated with tinct. cantharides after each injection; blisters to insides of the thighs.

29th. Some irritation of the vagina; cough not so bad.

\mathcal{R} Rad tarax. \mathfrak{z} i:

Sanga. \mathfrak{z} i:

Fol. savin. \mathfrak{z} i:

Lig. guaiac. \mathfrak{z} i:

Water lb. vi.

Boiled down to half.

A gill to be taken four times a day with 20 drops tinct. cantharides added; object to determine to the

* \mathcal{R} Muriate soda \mathfrak{z} i:

Sulph. soda \mathfrak{z} ss:

Carb. potassa \mathfrak{D} ss:

Mix.

skin, as well as to the genitals; this not having been effected by the tampon, &c.

March 2d. Cough considerably relieved; no pain of the chest, great tenderness and irritation of the vagina, no leucorrhœa; sponge and injections discontinued, decoction taken but three times a day.

6th. The whole surface of the body covered with a miliary eruption, the itching excessive; no cough; appetite good; taste natural. R. A little meat allowed well salted; wine whey for drink instead of that made with vinegar; dose of the decoction diminished; the cantharides omitted.

12th. The eruption has disappeared, the patient continues to improve; decoction discontinued.

R̄ Ext. tarax. ʒvi.

Sanguinaria ʒi:

M. ft. pillu. 60.

Two to be taken three times a day.

R̄ Sulph. ferrii. }
Carb. potassa. } aa ʒss.

M. ft. pillu. 48.

One to be taken three times a day; the dose to be gradually increased until within the week four shall be taken at a dose; diet more liberal; brandy toddy in the forenoon, at which time unusual debility is complained of.

15th. Slight diarrhœa; chalybeates discontinued.

17th. Chalybeates resumed; more liberal allowance of animal food; skin more clear; patient considerably improved.

20th. Catarrh contracted. R. Blister to the spine; chalybeates discontinued.

24th. The catarrh has degenerated into bronchitis.

℞ Balsam copavia ʒii:

Gum arabic ʒii:

Tinct. opii. ʒi:

Spts. terebinth ʒss:

Boiling water ʒiii.

M. ft. solut.

A tea-spoon full to be taken three times a day.

26th. Tubercular expectoration and hectic fever.

27th. R. An emetic.

29th. R. An emetic.

30th. Diarrhœa. R. Tinct. opii. vin. antimo. & spts. nitre, after each operation until checked.

April 2d. Chalybeates resumed.

4th. Allowance of full diet, with wine, toddy, or porter, ad libitum.

15th. Pain in the tuberculated region; patient otherwise greatly improved. R. Blister over the spot the size of a dollar.

17th. Continued pain with crepitus. R. Cal. grs. ii: antimo. 1-8: opii. 1-4: every four hours. Chalybeates discontinued.

19th. Fever and tuberculous expectoration; calomel discontinued.

20th. An emetic.

23d. An emetic.

26th. Chest relieved; chalybeates resumed.

May 13th. Pain in the chest; furred tongue; loss of appetite. R. Small blister to the painful spot; calomel one grain three times a day; chalybeates discontinued.

16th. Symptoms relieved; chalybeates resumed.

30th. Menstruation came on with pain of the loins; dysurea and diarrhœa; chalybeates discontinued.

R. hip bath, weak decoction of erigeron to be drank freely. Menstruation continued but two days; patient in excellent condition; has no remaining indication of tubercles in the lungs. R. Chalybeates, tarax. & sanguinaria, and animal food in continuation.

June 21st. Dysentery with purulent discharges and hectic fever. R. Cal. opii. & antimo.; chalybeates discontinued.

24th. Chalybeates resumed.

29th. Menstruation—which continued four days.

July. Patient makes a trip to the country. Advised to take tarax. & sanga. for one week before each menstrual period; and chalybeates for two weeks following them; regularly and perseveringly.

Sept. 1st. Dysentery with purulent discharges. She had neglected the prescription, and failed to menstruate at the last period. R. Cal. opii. & antimo.

7th. Patient dismissed with the former prescription.

Dec. 12th. Attacked with cough, pain in the breast, and fullness of the head; much alarmed. R. Sulph. soda, sulph. magnesia, muriate soda of each $\frac{3}{4}$ ss.; to be worked off with hot sangaree; if operating too severely, to be checked with tinct. opii. & vin. antimo..

14th. Perfectly reinstated.

1843. This patient has had no farther attacks; and is at this time in good health in every particular. Clear skin; ruddy complexion; regular menstruation; fine digestion; and the diathesis seems entirely changed.

CHAPTER VII.

PREVENTION OF CONSUMPTION.

508. However curable consumption may be, its prevention is a paramount consideration, for although when cured at an early period, and by process of absorption the situations from which tubercles have been removed, may seem to be reinstated; yet there is reason to believe, when the tubercles have been of considerable size, that displacement, condensation, or other form of induration of the tissues, frequently remains, by which the functional operations of the pulmonary organs are more or less impaired.

509. When removed by process of ulceration, post-mortem observation establishes the fact, that the organic structure of the lungs is materially mutilated and impaired; and impervious cicatrices, or gaping caverns, crippling the organs and curtailing the important functions of respiration which the naturally contracted formation of the tuberculous chest, had already too much restricted, render the unfortunate subject a valetudinarian for life.

510. But even when cured, if the tubercular diathesis remains, according to the inviolable law of nature, that "like causes produce like effects," there must be constant liability to recurrence of the disease from the most trivial and unavoidable occurrences; and we have physiological and pathological reasons to believe that many individuals have suffered repeated cures and recurrences, before they have been carried

off. (118.) The fatal termination "arises not so much from the effects of the first crop of tubercles, as from the successive deposit of new ones in different parts of the lungs, or rather from the accompanying fever and irritation. Hence a patient rarely dies of one attack of phthisis, except it be of a very acute form."*

511. Thousands annually die of tuberculous diseases without the cause of death having been detected or even suspected, until developed by post-mortem examination. This is especially the case with children, and at the early period of life when organic mutilation is so deplorable; and when prevention is so infinitely more valuable than cure and when this as well as cure may be most easily effected. I have repeatedly treated children even of the most strongly marked tubercular diathesis, who had abdominal tubercles preceptible to touch, with tubercles in the neck and symptoms and signs of tubercles in the lungs; whom I have perfectly cured in the short period of eight or ten weeks.

In consumption a paramount duty of the physician is to discriminate the *tuberculous diathesis*, to anticipate and to *prevent* the occurrence of the *disease*, to correct and to *change the diathesis*, and dispel the tendency to the dangerous declivity.

TUBERCULOUS DIATHESIS.

This constitutional bias is determined by the following personal physiological and pathological indications:

* Ghehard on the chest.

513. The personal appearance, indicative of tendency to consumption, is dependent mainly on the formation of the chest, the complexion and texture of the skin, and the character of the mind. Each of these indications may be either of natural or morbid origin, and it is therefore conceived that it will be conducive to clearness and precision in representation, to present them under the separate heads, following:

NATURAL PREMONITIONS.

514. *With reference to personal conformation:* A slender form, long neck, long delicate fingers, narrow or flat chest, and projecting or winged configuration of the shoulder blades, comprise the most common configuration. The diathesis here, is mainly dependent upon the insufficient capacity of the chest through want of breath. But there is another conformation very unlike this, that equally interferes with the respiratory process, on account of insufficient *length* of the the chest, distinguished by unusually short body, in proportion to the extremities, shoulders projecting upwards, pointing to the ears; the lower end of the sternum projecting upward and outward, a peculiarity of configuration caused by the unusual lateral pressure of the pulmonary organs.

515. The skin is remarkably *thin*, "fair and delicate, the hair light, the countenance full and pasty, the upper lip tumid, eyes blue, with large pupils, and the lids fringed with long lashes, the expression serene and placid, the mind unusually intelligent, and the nervous system highly excitable." "Occasionally the skin is dark and extremely fine, the hair raven black,

and the intellect at once sprightly and intelligent." However the skin may vary in color, it may be observed, it is always abnormally *thin*. (159-60.) Children of this diathesis are generally weak and delicately formed, and all of their physical functions are imperfectly performed. "The circulation is unusually feeble, and hence the extremities, especially the hands and feet are almost always cold; digestion goes on imperfectly; the bowels are either sluggish or too loose; the urinary and cutaneous secretions are deranged; the muscles are soft and flaccid; the joints appear as if they were too large; the belly is habitually tumid; the head disproportionately bulky; the upper lip unnaturally full; and the countenance has a swollen, sickly" * aspect.

MORBID INDICATIONS.

516. *With regard to the pulmonary functions:* Deformity of the chest from spina bifida, from rickets affecting the sternum and ribs, from fractures, contusions, &c.

517. *With regard to the perspiratory functions:* Countenance swollen, complexion commonly dark, or of muddy greenish yellow tint, skin uneven, in thickness and feeling doughy to touch; eye lustreless and

* The above are the indications which have been observed time immemorial, but are quoted here almost verbatim, from Gross' Pathological Anatomy. I should have quoted uninterruptedly, only that the doctor had intermixed natural and morbid indications in the usual manner, which was considered objectionable, as making the catalogue so general and discordant, that it ceases to be characteristic.

leadens; mind dull and sluggish; abdomen tumid and irregular. This is the condition most frequently accompanied by those cutaneous eruptions and irritations which have been remarked mostly to pertain to the tuberculous diathesis—eruptions on different parts of the body, especially about the ears, and chronic inflammation of the eyes, with dry itchy irritable condition of the nose, which is subject to frequent hemorrhages.

518. If these monitory indications of the disease are remarked and attended to in time, it may in almost every instance be controled, especially in children and at puberty; and may be converted even to an extreme opposite diathesis, (which is to be guarded against,) generally by regimen alone without resort to medicine.

ANTIPODES DIATHESES.

519. Persons who have constitutional predisposition to disease, have necessarily a tendency to deviate in some degree to one side or the other of the healthy medium. The opposite deviations are generally distinguished as the *sthenic* and the *asthenic* diatheses. The extremes of these diatheses, as we have elsewhere pointed out, (55,) may be set down in opposition, as chlorosis, phthisis and dropsy on the one hand, gout, apoplexy and scurvy on the other. The personal appearance given above, indicates the former. Those of sthenic diathesis, the gouty, &c., are generally robust and of rather clumsy make, with large joints and heads, rough skin, and corpulent habit. (56.)

520. The blood in persons of those opposite diatheses, differs quite as remarkably as their personal aspects differ, and to opposite extremes of the character of blood which is considered healthy. The blood of the tuberculous or serous diathesis, is thinner, poorer and paler than that of the healthy, (63, 64;) whilst that of the gouty is thicker, richer and darker. (58, 59, 60.)

521. This is worthy of strict attention; for the gouty, though commonly plethoric, are liable to a degree of morbid action which eventuates in excessive absorption and atrophy—the scorbutic degeneration—which atrophy sometimes bears an aspect so similar to atrophy from phthisis, as to have induced some high authorities to question whether there was not an identity in the two diseases. Yet these diseases are extreme opposites, and require diametrically opposite regimen as preventitives; and the appropriate treatment for the one, applied to the other, would inevitably hasten to a fatal catastrophe. And in either diathesis the digestive apparatus is liable to disturbance, and a tuberculous and an anhrithic dyspepsia demand as opposite treatment as phthisis and gout.

522. *Diagnosis from the blood.* In case of any dilemma as to diagnosis, with regard to these extremes, the difficulty may be readily solved *by letting a few ounces of blood.* *The large, loose, dark coagulum of the one, is so broadly in contrast with the small pale clot of the other, as immediately to settle the difficulty.* I have no doubt that persons, especially children, have often suffered and even died, in questionable cases from erroneous treatment, which this unerring diagnosis would have conclusively settled in a moment.

523. *Causes of gout.* *The occasional causes of disease* in the opposite diatheses, alluded to, differ as widely as do the hereditary predispositions or personal conformations. "The occasional causes of gout seem to be of two kinds: first, those which induce a plethoric state of the body; secondly, those which, in plethoric habits, induce a state of debility. Of the first kind are a sedentary, indolent manner of life, a full diet of animal food, and a large use of wine and of other fermented liquors." "The gout seldom attacks persons employed in constant bodily labor, or persons who live much on vegetable aliment. It is also less frequent among people who make no use of wine or other fermented liquors."*

524. *Causes of consumption.* As regards dieting, the accidental causes of tubercle consist in "the use of food which does not sufficiently repair the forces of the system, various excesses which exhaust those forces, and waste the nervous influence to the detriment of the nutritive powers; such are the causes which, while they induce in the blood an impoverishment, indicated externally by the state of the skin and muscles, and impress on every hyperæmia a chronic or languid character, tend also to produce in every organ the secretion of tubercle."†

ANTIPODAL TREATMENT.

525. In view of those diametrically opposite causes and indications, and of the fact that the antiphlogistic regimen has been established by so much experience

* Cullen. † Andral.

to be adapted to treatment of the sthenic diathesis, the question naturally occurs, on what grounds can we reject the applicability of an opposite regimen, to a palpably opposite state and condition?

“All diseases,” says Hippocrates, “which proceed from repletion, are cured by evacuation, and those which proceed from evacuation are cured by repletion. And so in the rest; contraries are the remedies of contraries.”

The processes of nature accord with those indications, and with this injunction of the father of physic—the great and minute observer of nature’s laws. All nature’s conservative and restorative efforts are of the essence and character of this antagonistic principle. This, too, is of the essence of the pathology and therapeutics of the most renowned physicians of antiquity and also of the most celebrated modern authors. Asclepiades, who, as well as Hippocrates, was dependant solely on the results of experience and observation—unaided by the lights which we derive from a knowledge of the nervous and circulating systems, and of the controlling functions of absorption and nutrition—adopted the hypothetical “corpuscular philosophy” of Epicurus as the basis of his doctrine. Which teaches that “from the changes which natural bodies undergo, that there is a perpetual formation and destruction of them going on.” That “the whole phenomena of the production, growth, decline and dissolution of bodies, is to be ascribed to an alternation of arrangement in the particles and to their addition or subtraction.”

Themison, who sought as a compromise a middle course between this and the Hippocratic system, ma-

terially improved both. He taught, in effect, that the mutation or disproportion "which is the source of all maladies," is incident to every part of the body, solids and fluids. On this theory was founded the "methodic" practice, antagonistic of the various changes that were remarked: which was the most durable, the simplest, and is considered the best of any of empirical origin. It consists essentially in appropriately regulated dieting.

Of this essence, too, are the modern systems—the physiological—that are in highest estimation at the present day. Of this character is the essay at the simple division of diseases into "sthenia and asthenia." We are assured indeed that it was to the stimulus of the supercilious reception by Cullen of Brown's suggestion "on the incomprehensible ideas of atony and spasm* existing in the same vessels of the body at the same time," that we are indebted for the production of the ingenious and celebrated work, the "Elementa Medicinæ."

526. Health consists in perfect equilibrium in the functions of all the organs of the body. Equilibrium is maintained by action and reaction of co-operative and antagonizing functions and forces acting upon one another. Thus the presence of the blood stimulates the heart and arteries to contract; their contraction propels the blood to all parts of the system to replenish the wastes, and to stimulate its different organs to the performance of their respective functions: the stomach among others, to appetite, and to the digestion of food for supplying the waste of the blood; all

* Antipodes, (527.)

going to sustain an equipoise between the great antagonizing functions of absorption and nutrition; or the builder up and the puller down of the body.

“That condition of the body,” says Liebig,* “which is called *health*, includes the conception of an equilibrium among all the causes of waste and supply; and thus animal life is recognized as the mutual action of both; and appears as an alternating destruction and restoration of the state of equilibrium.”

527. Neither are the antipodal phenomena restricted to the conditions of the fluids; either in diseased or restorative action. On the contrary, more disorders seem primarily to impinge on the nervous than on the sanguiferous system—as exemplified in diseases of contagious, epidemical and casual origin. These assail indiscriminately every diathesis,† serous or globulous. Hence the futility of a uniform or a nosologically arranged treatment, of scarlatina, measles, puerperal fevers, &c.; whether it be phlogistic or antiphlogistic; and the variable success of either; proving successful in one case or family and destructive in another. Hence too the variable phases of the fatal termination exhibited in scarlatina: which when eventuating in gangrene, the mortification is in one set of cases found to be of tonic, in another of atonic character. Some die of hæmorrhage or apoplexy; others in consequence of tuberculous or dropsical effusion. Some exhausted by excessive sensorial irritation, die from congestion of the capillary system,

* Liebig's Animal Chemistry.

† Health, the rare condition of perfect equilibrium, is probably impenetrable to such influences.

who are seen covered with vibices, with livid tonsils and fauces; others sink through want of stimulation and power in the sentient apparatus to propel the blood into the capillaries, who present in death a pale constricted surface, and ash-colored ex-sanguine tonsils and fauces. And so in the rest.

528. In nervous disorders nature's restorative efforts are shewn to be of the essence of the antipodal principle, in the following experiments by Darwin:

"Place a circular piece of red silk about an inch in diameter on a sheet of white paper in a strong light, look for a minute on this area, or till the eye becomes somewhat fatigued, and then, gently closing your eyes and shading them with your hand, a circular green area of the same apparent diameter becomes visible in the closed eye. This green area is the color reverse to the red area which had been inspected."

"Red silk produced a green spectrum;

"Green produced a red one;

"Orange produced blue;

"Blue produced orange;

"Yellow produced violet;

"Violet produced yellow."*

The result of Sir Isaac Newton's observations in optics is to the same purport. So also when our muscles are fatigued by the long continued action of a limb in one direction, the natural impulse is, to relieve them by throwing the limb in the opposite direction.

I have produced tetanus in the dog by inserting metallic points into nerves of the leg: which was con-

* Zoonamia.

trolled at will, by trepaning the cranium and compressing the brain. When perfectly suppressed, by removing the pressure a few hours the spasms would recur. In this way the efficacy of this method of relief was repeatedly tested. The above observations I think justify the conclusion that "atony and spasm" are antipodal instead of coincident conditions. And tenanus and paralysis I conceive are entitled to be considered extreme antipodal morbid deviations from the healthy medium in the sensorial motions. And in these we see the repulsion of the one by the production of the other.

529. Any disturbance of equilibrium, whether from medicines or from accidental causes, constitutes a deviation from health. It matters not whether it consists in excessive nutrition or excessive absorption. Or, in other words, whether we grow too fat or too lean; either is a diseased condition; the diseases are antipodes; and if either occurs to a degree demanding treatment, opposite modes would certainly seem to be demanded, on the same principle which nature uniformly adopts.

530. The antagonistic principle of action and reaction is not only remarkable in nature's healthy operations, and in the production of disease, but is also seen to be of the very essence of her restorative principle. Thus the body when chilled, is relieved by the alternation of a glow of heat. Both the chill and the glow are deviations from the healthy equilibrium; yet the one is nature's remedy for the cure of the other, which is accomplished by the oscillations of the diseased action becoming less and less, until they eventuate in equilibrium. Or, on the other hand, if

the deviations are progressive instead of retrogressive, the disturbance may eventuate in ague and fever; every paroxysm of which is constituted of antipodal conditions. Thus, in the chill, we suffer the sensation of cold, the skin is pale and shrivelled, its capillaries are contracted, and its perspiratory functions suspended; which if long continued must eventuate in death. But by reaction the whole condition becomes diametrically changed. The cold is succeeded by a sensation of intense heat, the skin becomes red and full, the capillaries distended, and perspiration profuse.

531. To interrupt such diseased condition, we have not only nature's indications, but are directed by the experience of ages to the employment of remedies that produce disturbances antipodal to the predominant diseased disturbance; such as stimulants and tonics, opposed to the cold stage, and refrigerants to the hot.

532. Yet neither of these classes of remedies is conducive to healthy action. Both are restorative only because antipodal to the diseased action, and so far from conducing to health they would, if used *in health*, prove just as efficient to disturb the healthy equilibrium, as in disease they are found to be for the control of the diseased action; *for any other but the natural action in a part, is an unnatural, or, in other words, a diseased action*; and for the same reason the same remedies misapplied may co-operate with, and augment, instead of antagonizing and curing the disease.

533. If, for instance, we were to invert the order of prescription, and administer the tonics and stimulants in the pyrexia, and the refrigerants in the apyrexia, we should, with the same remedies, pro-

gressively as much augment the morbid actions as by their appropriate application we should have diminished them.

534. All pathologists and therapeutists, as far as I am aware, are concurrent in this view, Hahnemann and his disciples excepted. They, as I understand them, administer the article which is best calculated to produce identically such disturbance as exists in the system at the time of administration.* Under this system infinitesimal doses are observed to be best. The sagacity of this discovery is wonderful! And its indubitable accuracy commands acquiescence. For, when a medicine *augments* the disease, unquestionably the less the better.

DIETING.

535. In cases of the constitutionally predisposed, and of convalescents, change of diathesis may generally be rested principally upon the proper regulation of regimen, dieting, &c.; and resort to medicine should, as much as possible, be avoided. This might, also, sometimes suffice in the incipency of disease; but reliance in that case would be unsafe and ill-advised.

536. Dieting, in the popular acceptance of the term, and extending in many instances to the medical portion, is nearly synonymous with starving; but such acceptance would be wide of the mark in adapting it to the indications in tuberculous disorders.

537. In dieting, the description of diet should be adapted to the character of the disease whatever it

* See Rosenstein on Hamœopathia.

may be; and to accomplish this adaptation the diet must be as various as are the classes of disease. It would be as absurd to restrict a patient who labors under a disease which in its whole progress and tendency inclines to debilitate and attenuate the body, fluids and solids, to rice slops and gum water, as to surfeit one who labors under inflammatory disease with animal food and stimulating beverages.

538. Dieting is a nice and delicate matter; demanding as much greater judgment on the part of the physician who directs it, than the application of his medicines, as it is essentially of greater importance to his patient's welfare. Yet it is generally the weakest and most ignorant of the profession who are most officious in regulating and controlling it. Their supposed *harmless parade of skill for effect*, in this, very often causes the infliction of more injury in a day than their medicines can relieve in their patient's life-time. I have known instances of the whole effort being, as it were, directed to thwart every fancy of the patient's feeble appetite: skilfully and profoundly prescribing something else, to which there was a loathing; and thus losing the only favorable opportunity which ever offered for the reception of vitally essential sustenance.

539. As a *general rule*, we can but seldom do better than to be governed pretty much by the patient's appetite; especially in tubercular cachexia: in this I venture the assertion that in 39 cases out of 40, there is an avidity for animal food highly seasoned with salt; and for sugar, butter, and stimulating beverages. Yet in many such cases these things will be found authoritatively prohibited. Nurses, almost without exception, are impressed not only with the salutary maxim

that, "in disease dieting is of the essence of the treatment," but also that dieting and starvation are one and the same thing; and that all of the nutritions and invigorating cravings of the emaciated sufferer, are especially to be resisted. In this they too often are sustained by some ill judging physician.

540. We have reason to believe that most consumptions are susceptible of spontaneous removal: especially cases that occur in early life. Or, in other words, *are cured by regimen intuitively adapted.* (117-301.)

541. The results of my own observations accord with the pathological indications above referred to. And we have the following physiological reasons to believe that both hunger and thirst depend on the condition of the nutritive function; and that the natural demands of this produces instinctive cravings for such articles as the condition of the function stands in need of:

542. "It is usual to attribute hunger to an affection of the nerves of the stomach, and thirst to impression on the nerves of the fauces and pharynx. But it is far from certain that either of these suppositions is just. Nausea is habitually referred to the stomach, upon the same grounds with the sensation of hunger; yet, according to experiments of Magendie, after the removal of the stomach of an animal, nausea and retching may be produced by injecting tartar emetic into the veins; and Dr. Gardener remarked, that in the case of a man who had cut through the œsophagus, several buckets full of water were swallowed daily, and discharged through the wound without quenching thirst. The thirst, in this instance, it was afterwards found, admitted of being allayed by the injection of

spirits diluted with water into the stomach. It is therefore not impossible that a person might be hungry without a stomach, and thirsty without a throat."*

543. Inferior animals are directed more unerringly by appetite than man, who so often substitutes his judgment, that instinct in him becomes weakened through want of exercise. But the selections of children in health and in convalescence may be more relied upon for being in accordance with nature, uncorrupted by artificial dishes and forced habits. With them *milk* is the general favorite; the only article which nature has furnished expressly for food: for, milk is the first, the unsophisticated craving of all animals under the influence of instinct. We are furnished with the following among other evidences, that the preference is instinctive, and not accidental:—"On dissecting," says Galen, "a goat great with young, I found a brisk embryo, and having detached it from the matrix, and snatched it away before it saw its dam, I brought it into a room where there were many vessels, some filled with wine, others with oil, some with honey, others with milk, or some other liquor; and in others there were grains and fruits. We first observed the young animal get upon its feet and walk; then it shook itself, and afterwards scratched its sides with one of its feet; then we saw it smell to every one of these things that were set in the room, and when it had smelt to them all, it drank up the milk."

544. Milk, then, may be assumed as the standard for a healthy diet; and if a person is below the healthy

* Mayo's Physiology.

standard, and is found craving a diet more nutritious than this, it may reasonably be supposed that his nutritive functions demand that which he craves.

545. The essential ingredients of milk are—“saccharine, oily, and curdy, or albuminous matter.” These, then, may be considered essential ingredients for a nutritious compound; and accordingly, experimentalists have proved that no animal can live long upon any one of those constituents exclusively; some do better on one, some on another; but all do better on a mixture approaching the standard milk.

546. “But it is in the artificial food of man,” says Dr. Prout, “that we see the great principle of mixture most strongly exemplified. He, dissatisfied with the productions spontaneously furnished by nature, culls from every source, and by the power of his reason, or rather his instinct, forms in every possible manner, and under every disguise, the same great alimentary compound. This, after all his cooking and art, how much soever he may be inclined to disbelieve it, is the sole object of his labor; and the more nearly his results approach to this, the more nearly they approach perfection. Thus, from the earliest times, instinct has taught him to add oil or butter to farinaceous substances, such as bread, and which are naturally defective in this principle. The same instinct has taught him to fatten an animal with the view of procuring the oleagenous in conjunction with the albuminous principle, which compound he finally consumes for the most part, in conjunction with saccharine matter in the form of bread or vegetables. Even in the utmost refinement of his luxury and in his choicest delicacies, the same great principle is attended to,

and his sugar and flour, his eggs and butter, in all their various forms and complications, are nothing more or less than disguised imitations of the great alimentary prototype milk, as presented to him by nature.

547. But let the selection of food be made as it may, whether by judgment or by instinct, the choice is controlled at last by nervous functions; and the whole matter is resolved into the question—should the election be determined by *organic* or by *animal* nerves?

The nutritive is an organic function, and is under the superintendence and control of an especial set of nerves, which we find capable however the food may have been selected, of culling from it, in form of chyle, that which is fit for nutrition, and rejecting the remainder as fæces; and with admirable precision regulating the various secretions from the blood, which are necessary to sustain the body, and to reproduce the lost substances of its various tissues; directing depositions of bone in one part, muscle in an another, cellular tissue in another, &c.—functions out of the purvey and beyond all control of the animal nerves. And why should not those nerves, which are especially and exclusively nutritive and organic, be esteemed equally as fit to direct the selection of aliment, from which, under their superintendence, this nutriment is to be elaborated, as the optic, the olfactory, or the gustatory:—nerves which are neither *especial*, nor *organic*, but *animal*, and *various* in their functions?

548. Man is, by nature, omnivorous; and to be healthy, he must, in accordance with his nature, live on various and mixed food. But he is found stouter,

more athletic of body, and more vigorous of mind, in proportion to the richness and carnivorous character of his food; and more feeble in proportion as it is more succulent and vegetable.

549. One English beef-eater, history tells us, is a match in prowess, for six native Hindoos, who are said to be raised without knowledge of the flavor of meat.

The following table constructed by Sir James Clark from Marshall's Medical Topography of Ceylon, exhibits the proportionate mortality from consumption to be greater among the natives than among resident Europeans, in the island; in the tremendous proportion of about from 13 up to 34 to 1.

	Europeans.	Malays.	Caffres.	Indians.
Total deaths in 1,000 persons during one year,	142	36	49	45
Deaths from consumption in 1,000 persons during one year, - - - - -	0.6	2.8	7.	2.6
Deaths from consumption, in 1,000 deaths from all diseases, - - - - -	4.3	58	146	59

We also see (590,) that the proportion of deaths in the West Indies, from consumption, is vastly greater among the negroes than the whites; and it is notorious that the former habitually consume less meat—on many plantations none is allowed them.

Dr. Rush tells us—1st, “That it [consumption] is *unknown* among the Indians of North America.

2d, “That it is scarcely known by those citizens of the United States, who live in the first stage of civil-

ized life, and who have lately obtained the title of the first settlers." *Medical Inquiries*.*

550. The difference in athletic vigor, between exclusively herbivorous and exclusively carnivorous animals, is still more marked.

The panther is a match for a horse or ox ten times his size. The lion devours the elephant. And, with reference to our especial subject, the exclusively carnivorous are the least subject to tubercle; in the free, wild state, probably not at all so, but on the contrary they, as well as birds of prey, have been found to present indications of the gouty diathesis, (334,) as if a necessary consequence of tuberculous exemption.

551. From all this I think it may be safely inferred that meat diet is the most invigorating and best adapted for persons of feeble constitution; and that they might at least be permitted to indulge their preference, if such should be their election. My own observations in the matter satisfy me, independently of inference from the marked contrast in aspect and in every characteristic of the two diseases, (61, 307 and 63, 305,) that the judicious and appropriate use of animal food and common salt will be found as efficient preventives of consumption, as acid fruits and succulent vegetables have but recently been discovered to be of scurvy.

* To the Indians, consumption is *now* known; though with them, as well as with the frontier settlers, the disease is very rare. The Indians are almost exclusively carnivorous; the pioneers, for several years after settling, are necessarily very nearly as much so. Dr. Rush ascribes exemption in both cases to laborious exercises. But the Indians are proverbially lazy, and are both less regular and take in the aggregate, less exercise than whites.

552. But such, unfortunately, is not generally the opinion of nurses, or even of physicians. The robust may indulge with their sanction, to their injury, and to the production of obesity, gout or apoplexy. While strong diet is prohibited to the cravings of the weakly, as being too gross for their delicate habits. And although all the consumptive die, who are thus nursed, yet nothing profiting from experience, those who undertake the care of such patients, resolutely nurse on all new cases in the same way, to the same termination.

553. Those who can escape such tender mercies, and betake themselves to traveling, to hunting or to sea-faring, are seen often to recover; but the recovery is ascribed to riding, walking, sailing, or to any thing else in preference to change of aliment. Restoration, in a disease acknowledged to have its origin in the degeneration of the blood, may, it is imagined, be accomplished by any other thing more readily, than by that from which this blood, the source of the morbid matter which constitutes the disorder, is immediately elaborated.

554. The following remarkable experiments of Magendie exhibit the effects of restraint upon natural appetite, and restriction in dieting animals:

M. Magendie fed dogs, &c. exclusively on some one of various nutritious articles, such as sugar, oil, gum, butter, &c.; allowing air and water as usual. They died within an average of about 30 days.

555. "A dog fed with white bread, made from pure wheat and with water, died at the expiration of 50 days. Another, fed exclusively on military biscuit, suffered no alteration in its health. Rab-

bits and Guinea pigs fed upon one substance only, as corn, hay, barley, carrots, cabbage, &c., die with all the marks of inanition, generally in the first fortnight, sometimes sooner.

556. An ass fed on boiled rice died in fifteen days, having latterly refused its nourishment. A cock lived for many months upon this substance, and preserved its health.

557. Dogs fed exclusively with cheese, or with hard eggs, are found to live for a considerable period, but become feeble, meagre, and lose their hair.

558. The substance from which Guinea pigs can derive nutriment for the longest period, appears to be muscular flesh."

559. "When a certain degree of emaciation has been produced by feeding an animal for some time upon one substance, as, for instance, upon white bread during forty days, the animal has appetite left to eat with avidity different kinds of food, but the change in diet comes too late; the animal does not regain its strength; it continues to waste, and dies about the same time at which its death would have happened had the exclusive diet been continued."*

I have known promising families of children destroyed, or ruined in constitution by analogous measures, simply by being "over wise" in regulation of their diet.

560. "A child," says Darwin, "of a week old, which had been taken from the breast of a dying mother, and had by some uncommon error been suffered to take no food but water-gruel, became sick and

* Mayo's Physiology.

griped in twenty-four hours, and was convulsed on the second day, and died on the third. When all young quadrupeds as well as children have this natural food of milk prepared for them, the analogy is so strong in favor of its salubrity, that a person should have powerful testimony indeed of its disagreeing before he advises the discontinuance of the use of it to young children in health, and much more so in sickness. The farmers lose many of their calves which are brought up on gruel, or gruel and old milk; and among the poor children of Derby, who are thus fed, hundreds are starved into the scrofula, and either perish or live in a state of wretched debility."*

561. A majority of the cases of dyspepsia that I have treated, have originated somewhat in the same manner. Dyspepsia is a disease more commonly the precursor of consumption than any other generally reckoned among the occasional causes of tubercular degeneration.

It is no uncommon thing for an intelligent laboring man to endeavor to preserve his health, and to invigorate his strength, by attention to dieting. If he essays to be learned and knowing on this subject, he finds out that of all diets meats are the easiest of digestion, and the most nutritious and invigorating; especially those which are dark and fibrous, such as beef, mutton, and venison. He very judiciously, therefore, satiates himself with beef, and goes about his work, at which he has to labor from 7 to 11 hours, upon the sustenance of this meal, as may be his custom, of eating twice or thrice a day. The average

* Zoonomia.

time requisite for the digestion of beef is about three hours.* In such a case as the one supposed, the digestion would be performed in the shortest period, and the experimenter, therefore, must labor at least from four to eight hours upon an empty stomach, which all the time grinds its inner surfaces against each other in the performance of its perpetual peristaltic motions; its undiluted gastric liquor, which is competent to dissolve brick-bats, goading it on as though it would dissolve it in subserviency to the nutritive demands of the body. He necessarily becomes qualmish of stomach, and faint and weak of body. But the cause of these effects had never entered into his philosophy; on the contrary, the faintness, and the sickness of stomach, are supposed to be the effects of weak digestion; the remedy indicated he conceives to be an aliment *easier* of digestion. Mutton is tried; he is no better; next venison; still no better; but as nothing sufficiently nutritious is lighter than this, the expedient of taking less of it is tried. "He grows no better, fast," until he becomes a confirmed dyspeptic.

562. His neighbor less learned, less wise, and perchance, even less vigorous of body, who knows no better than to be governed by the preferences of his appetite, fills himself daily with horrid messes of fat bacon and fried cabbage, which the stomach of an ostrich could scarcely digest under seven or eight hours. This sustains him through the day, he returns from his labor with a portion left, and he continues unexhausted and in health.

* Beaumont's Experiments on Digestion.

563. The thoughtful clerk, the learned divine, and not unfrequently the studious non-practising physician, who, through want of exercise, experience dyspeptic forebodings, observant of such occurrences, often sagely determine to profit by the example. They accordingly force into their stomachs plenty of good bacon and cabbage, which, with their sedentary habits, their stomachs would not digest in a week. The necessary consequence of want of the antiseptic effect of digestion upon such articles, in such a temperature, is fermentation, and the abdomen swells, works, twists, boils, and evolves gas like a very krou-tub, till, sometimes, unfortunately for the luckless savaan, putrefaction, fever, and intestinal mortification follow.

564. In all of those cases the appetite will have been found exactly in accordance with the demands of the constitution, and the vocation of the individual. In the midst of the most princely luxuries, the laborer requires as a general diet something of the description of bacon and cabbage; a diet at once nutritious and slow of digestion. The clerk, the student, or the sedentary operative, craves articles that are light and easy of digestion; or slow of fermentation. The very fumes of boiled krou or of fried cabbage, which would feast the nostrils of the laborer in advance of dinner, would surfeit and annihilate the appetite of the student.

565. But, although the appetite may be invariably relied upon in health, yet there are cases in which it is rendered morbid by disease, by gluttony, by epicurism, by starvation, and by constrained habits, or erroneous directions in dieting; which require to be changed, and in many cases much caution is requisite

in making the change, which should be done gradually; for, sudden changes, even from worse to better, are often dangerous. "It is dangerous," says Hippocrates, "much and suddenly either to empty or fill, heat or cool, or by any other means to move or stir the body. For whatever is beyond measure is an enemy to nature. But that is safe which is done little by little, and especially when a change is to be made from one thing to another."*

566. If the patient has been restricted to very low diet, caution should be exercised in bringing him up even to the healthy standard—milk; getting him to this, or to animal broth equally rich, we cautiously proceed, by making the broth richer and richer by abstracting more and more gelatine in cookery. Or, in case of milk, by the addition of cream progressively, until gradually we come to use, safely, solid animal food; which, well seasoned with salt, will, in time, if the disease has not actually set in, accomplish our object in changing the diathesis without recourse to the materia medica. Constant care should, however, be taken that too much is not eaten at a time. Over-eating, especially of stimulating diet, is productive of feverish tendency, and is pernicious to nutrition. The injunction, never completely to satiate the appetite, is never more important than when the diet is animal food. But it is almost equally important that the stomach should never be long empty. And, as animal food is of all aliment the easiest of digestion, at least four or five meals at equal intervals should be taken every day, should the appetite require it.

* Aphorism 51.

567. If improvement does not soon become manifest, as there is every moment danger whilst in a state of tuberculous atrophy, inasmuch as a catarrh, a fever, or any untoward accident which might a little more depress vital resistance, may at any hour become productive of the full development of tubercles in the lungs, we should resort to farther measures in furtherance of our object; to fermented or distilled liquors, for instance, or to chalybeates, &c.

568. In some cases, too, in either diathesis, from habitude or from disordered condition of the nutritive function, from having been long thwarted and irritated by an absurd course of dieting, (559,) a morbid craving comes on for those very articles which are destroying the system, or for articles altogether heterologous or unnatural. Such persons can seldom be restored; but the effort should be made by the use of alterants, condiments, tonics, &c., to correct the aberration. In the interim we must overrule the appetite, and to the best of our judgment, adapt the diet to the condition.

569. Difficulty may sometimes arise, as before adverted to, in distinguishing the tuberculous from the scorbutic atrophy. This can seldom occur; but as it is possible, and as the mistake in treatment would be fatal, it should be attended to.

570. In either case we sometimes remark great emaciation, with tumid abdomen, and extreme atrophy of the extremities. In such the gouty or scorbutic are generally distinguishable by the red or ulcerated face; but not always, for the face may be pale and sallow, or blueish. It then becomes difficult to distinguish except by the history of the individual's manner

of living, or by that *unerring test*, the *analysis of the blood*. (522.)

571. As to the subject of the gouty diathesis, when in this state of extreme atrophy, he may be considered as pretty much in the condition of Magendie's dog; he has been fed amiss so long that he is past recovery.

572. While with him of the tuberculous diathesis the condition is but that of chlorosis; a state which is merely premonitory of consumption.

573. From all those modern instances, I think we may be justified in deducing the following ancient conclusions of the father of physic; who of all medical chroniclers, was the strictest observer of nature's processes.*

574. "SECTION 1st. *Aphorism* iv. A slender and delicate diet, is, in lingering diseases, always dangerous."

"*Aph.* v. For the same reason a very slender and too precise diet, is sometimes dangerous to sound and healthful bodies, because they endure the errors of it with more difficulty. And therefore a thin and exquisitely sparing diet is more dangerous than that which is somewhat too plentiful.

"*Aph.* vi. To extreme diseases extreme and exquisite remedies are best."

"SEC. 2d. *Aph.* iv. Neither satiety nor hunger, nor any other thing, which exceeds natural bounds, can be good or healthful."

"*Aph.* xxii. All diseases which proceed from repletion, are cured by evacuation; and those which proceed

* Hippocrates.

from evacuation are cured by repletion. And so of the rest—contraries are the remedies of contraries.”

“*Aph.* xxxviii. Worse meats and drinks, if pleasant, are to be preferred before better, if unpleasant and distasteful.”

575. And the following, more modern:

In dieting, the selection of food is an extremely delicate and a most hazardous and responsible undertaking.

In the selection of food, either in health or in disease, the appetite is to be regarded; and is generally a safe and correct index. In health it always is such.

If the appetite craves a diet *manifestly* discordant with the indications in the disease, a morbid origin of the craving is to be suspected; in which case the judgment should take the selection in hand, and change it.

If dieting is to be changed, the change should be made gradually, if possible imperceptibly, without the infliction either of feelings of privation or of satiety, and in connection with medicines suitable to remove the morbid indications.

All excesses are injurious; but those of depletion are more dangerous than those of repletion.

To be too fat or too lean, are equally deviations from health, and they demand for their cure opposite descriptions of diet; a diet for each opposite to that under which the condition has occurred. So also with other antipodal conditions. “Contraries are the remedies of contraries.”

EXERCISE.

576. The various bodily, or rather muscular exercises heretofore detailed, (464,) as essential to treatment of consumption, are equally important to prevention. But in addition to those, there are other exercises of the lungs themselves, calculated to invigorate and to increase their powers of vital resistance to morbid action; which, though *wholly inadmissible* in their diseased, irritated and ulcerated condition, are important as preventives. Of this description are full drawn inspirations either with or without respirators;* but better effected by taking repeated long inspirations, to the extent of the capacity of the chest, without the instrument. Distressing palpitation of the heart, which is often merely on account of irritation from imperfectly decarbonized blood, (173-175,) may in most cases be relieved solely by a few successive *full* inspirations and *slow* expirations. The frequent sighing observable in such cases may be looked upon as efforts of nature to this effect.

577. A similar purpose is effected by blowing wind instruments, such as flutes, clarionets, or horns; though none of those should be carried to excess, or to the production of weariness, or dyspnœa.

578. In childhood and early life, exercises of the lungs are exceedingly important. It is this which

* This is the name generally given to various catchpenny instruments, in shape of long tubes, wire-work muzzles, &c., calculated to increase the difficulty of respiration, and thereby strengthening the lungs by increasing their exercise.

principally determines the development and formation of the chest. The crying of infants is important; and it may be remarked, that quiet, noiseless children are but rarely reared to maturity, especially if they are of tuberculous formation and complexion. All-bountiful nature has so arranged that children of consumptive tendency are more nervous, more excitable, and more given to fretting, crying and squalling, than any others; nature furnishing them the instinct to self-preservation. To drug those into quietude, as is sometimes practised, is but little short of murder.

579. At a little more advanced period, running, jumping, dancing, and various plays, particularly such as conduce to hilarity, and to boisterous use of the voice, should be encouraged. When sufficiently grown to engage in hunting, it should be preferred to any thing else for young people; and they should be encouraged to shout after the dogs, and to join them in the chase.

“Better to hunt in fields for health, unbought,
Than fee the Doctor for a nauseous draught.”

580. When at school, the exercises of speaking, singing, and playing on wind instruments, should be practised; and children should be encouraged, every where, to speak loud and much. At any age, loud public speaking and singing are highly advantageous exercises. But of all the exercises of the lungs, at any period of life, laughing is to be preferred. Those who are of tuberculous diathesis should never miss an opportunity of indulging in such enjoyment.

BATHS.

581. Towards prevention, it is exceedingly important to keep the skin clean and in good healthy condition, the pores open and clear of albumen and gluten. To effect this, sea bathing is most appropriate, or an artificial bath made in an equal degree saline, may be substituted. See treatment, (368.)

TEMPERATURE, CLIMATES, ETC.

582. Alternations of temperature are deemed among the most frequent causes of phthisis. Hence it is incumbent on the cachectic, as much as practicable, to avoid exposure to such influences, which may be accomplished, first, by changes of climate; secondly, by judicious construction of dwellings; thirdly, by proper adaptation of clothing.

583. Change of climate would most effectually accomplish the object, provided the invalid could enjoy alternately a winter and a summer residence. The first in a southern situation, the second in a northern mountain region; a migratory existence which is admissible to the circumstances of but few.

584. If a permanent change were desired, we should indeed be at a loss whither to go. According to the present weight of evidence, the temperate zone would seem entitled to the preference. For 30 years past or more, consumption has appeared as a more common disease of the torid, than either the temperate or frigid zones. The reverse of this, was formerly supposed to be the fact. Back to a period

of very remote antiquity, it seems to have been customary to send the consumptive to warmer climates; as, from Greece to Egypt, &c. How the change has been brought about; whether by change of regimen, or whether it is merely a change of impression, the consequence of more correct information, is yet to be determined. It is at least certain that the impression is changed.

585. Dr. Dujat informs us, that he saw as many cases of phthisis in the hospital at Rio Janerio, as in the hospital at Paris; and Professor Cross says, that during his residence in the south he witnessed as many cases, as he did in the same length of time in Kentucky.*

586. With regard to the Island of Madeira, the great place of resort for the phthisical of Europe, we are told, "though the climate of that island may be very beneficial to the consumptive of other countries, there is no disease more frequent than phthisis among the native inhabitants."†

587. M. Louis tells us that he has seen entire wards of consumptive patients in the hospitals at Naples.

588. And from the number of cures effected by Dr. Giovanni in the military hospital at Capua, 216 in less than four years, (359, 360,) if his losses in the time, were in any degree of proportion with those of other physicians, consumption is no uncommon disease in that region.

* Western and Southern Medical Recorder.

† Sir J. Clark.

589. From examination of army reports of mortality, on the various stations in the British service, through periods varying from three to seven years, Sir James Clark found the mortality from consumption "greater in the West Indies, than on any other station."

The subject is of so much consequence that I extract the entire table exhibiting the results of his valuable and elaborate researches on this subject.

590. For the attainment of greater accuracy, the subjoined table was constructed by Sir James Clark from two different tables of data—"One was formed from the records of single regiments during the period of their foreign services, the other was calculated from the mortality in large bodies of troops on the different stations, during a period varying from three to seven years."*

* Clark on Pulmonary Consumption.

TABLE

Showing the effect of climate in determining the prevalence of Consumption among the troops.

Stations where troops were employed.	Tables.	Yearly deaths from all diseases in every 1000 men.	Yearly deaths from Phthisis in every 1000 men.	Average mortality in 1000 men.	
				From all diseases.	From consumption.
East Indies and New South Wales - -	{ 1st table.	76.9	.6 } 1.5 }	57.5	1.0
	{ 2d table.	38.2			
Cape of Good Hope	{ 1st table.	16.0	1.4 } 1.8 }	14.5	1.6
	{ 2d table.	13.0			
West coast of Africa	2d table.			144.5	1.7
Mauritius - - - -	{ 1st table.	30.4	4.1 } 2.4 }	28.2	3.2
	{ 2d table.	26.0			
West Indies, Europeans - - - -	{ 1st table.	70.0	5.7 } 4.1 }	80.3	4.9
	{ 2d table.	90.6			
West Indies, Negroes	{ 1st table.	27.0	17.2 } 10.2 }	26.6	13.7
	{ 2d table.	26.3			
Bermudas - - - -	2d table.			12.4	2.3
Canadas and Nova Scotia - - - - -	{ 1st table.	12.5	3.5 } 3.4 }	12.2	3.4
	{ 2d table.	11.9			
Malta - - - - -	{ 1st table.	15.1	2.4 } 2.8 }	14.7	2.6
	{ 2d table.	14.4			
Gibraltar - - - -	{ 1st table.	17.2	2.9 } 1.9 }	13.1	2.4
	{ 2d table.	9.0			
Ionian Islands - - -	{ 1st table.	15.9	2.2 } 2.1 }	26.6	2.1
	{ 2d table.	27.4			
Malta, Gibraltar, Portugal, and Ionian Islands - - - - -	{ 1st table.			24.2	1.6

591. All the comparisons which I have made within the last 30 years, of reports of mortality in the United States, exhibit the deaths from consumption in the extreme southern cities, in greater proportion than in the northern.

So that it would appear, that, unless the patient was able, and could make it suitable to migrate, semi-annually from north to south, &c., he might as well remain at home in enjoyment of domestic comforts.

592. In truth, the requisite regulation of temperature, may be approximated as nearly perhaps, as requisite, in any of the temperate climates, by means of fuel, walls and clothing.

593. It seems that those who are habitually exposed to frequent vicissitudes of moderate duration, come easily to endure them, and they grow the more athletic. Nor is the philosophy of the thing either difficult or obscure. For we find every part of the body, the physiology of which we have any precise knowledge of, to be strengthened and developed by exercise, whether organ or function, as exhibited in the superior size and power of the blacksmith's arm, and in the superior strength of the forgerman's eye, which can gaze upon the sun without winking. Why, in like manner, should not the vital functions become strengthened when exercised by resistance to assaults from exposure to alternations.

594. It is only long continued exposure, exhausting to the power of vital resistance, which is obnoxious to health. And it would appear to matter but little as to the effect upon this, whether the exposure was to excessive cold or excessive heat. The old, it

would seem, can least endure the former; the young the latter.

595. In the construction of dwellings with a view to preservation of health, there are several particulars worthy of consideration. The first is as to the selection of a healthy situation. The second that the apartments should be large, airy, and so constructed as to accomplish exclusion of sun in summer, and in winter effectually to protect against the inclemency of the weather, and to prevent the impinging force of gales, without preventing free ventilation; and they should be well *heated with ample fires, economy in fuel*, in winter, being utterly *incompatible with preservation of health*. Access to this should be through an unheated hall, in which the invalid should remain several minutes, either when going out or coming into the heated apartment, and the colder the weather the more necessary the delay, to break the suddenness and violence of the alternation. In fair weather such transits should be frequent on account of the benefit of exercise in the open air.

CLOTHING.

596. Clothing should, in no instance, be excessive; but should be as strictly as possible adapted to the changes of the weather; and in cold seasons of the year, or even in cold, damp or chilly days, in hot seasons, should be increased in proportion to the change.

597. In winter, the clothing should be sufficient to prevent all unpleasant sensations from changes, in passing from warm apartments into the open air; and

to prevent the sudden escape of animal heat from the surface of the body.

598. Any considerable excess over this becomes debilitating, as we see exemplified in the doughy, soft flesh, and the tallowy complexions of persons who habitually sleep between feather beds; or in persons who cover their feet with several pair of stockings, and wear over-shoes, the feet becoming soft, tender and relaxed, and subject to excessive perspiration, which keeps them wet and cold, and proves in an unusual degree productive of catarrhal disorders. Persons whose feet are in this condition, whether from improper clothing or from other diseased conditions, would do well to use shoes with cloth tops, through which the perspiration could escape by evaporation.

599. In summer the least possible quantity of clothing should be worn that is consistent with decency, especially by children; who, if the degree of privacy is such as will admit of it, should generally go in a state of entire nudity, allowing free access to light as well as air. Various observations indicate that in the progress of their growth, the symmetry of their developments is materially modified by influence of light. Children raised in subterraneous mines are generally deformed. In very low or in very high life, the same tendency is remarkable; and it is also ascribed to the same cause: want of due access of light. With the first, through want of windows; with the second, through perversion of object, for which they were designed, by means of blinds, curtains, &c. Even plants, if deprived of light, grow distorted, and become blanched and sickly.

600. But the effect of superabundant clothing on temperature, is more marked and better understood. If the increased quantity of clothing did not increase the temperature, it would be folly to thicken it in winter. If the temperature is thus heightened in summer, it approximates the effect that a summer residence farther south, to an equal degree of exaltation of temperature, might be expected to have upon the system, and necessarily subjects to the same debilitating and deteriorating influences. Among these influences we see, as above, (589-590,) is tendency to consumption; but this is not all: the tendency to consumption is notoriously greater in persons passing out of hotter into colder climates than in stationary inhabitants. This is paralleled by arriving at winter through summer, made over hot by superabundant clothing.

601. "From the statements made in regard to the patients treated at the General Military Hospital of Chatham, England," says Prof. Cross,* "it appears demonstrated that the protracted residence in hot countries, and the diseases of those countries, give rise to tuberculous cachexia. It is a very great mistake to suppose that the tendency to tuberculous affections cannot be formed in hot climates. The long continued application of heat in early life is weakening, and therefore favorable to the formation of the tuberculous habits; and it is found by experience that the natives of those climates, both white and black, are peculiarly liable to tuberculous affections, especially when they come to colder climates."

* Western and Southern Medical Recorder.

602. This "long continued heat in early life," is even more weakening, and of more deleterious consequence, when kept up by suppressing its escape by clothing, smothering it in, as it were, (and with this suppressing the escape of the perspiratory fluid, retaining and endangering the re-absorption of the debris,) than when arising from an equal temperature in the open air.

FLANNEL.

603. These effects are most remarkable in persons who wear flannel in summer next the skin; the flannel is generally additional to the ordinary clothing. I have often observed with those who have worn it partially covering the body, as with shirt only, or drawers without shirt, that the part of the body which was covered with flannel was paler, softer, and looked less healthy; and the muscles were more flaccid than the remainder. The more weakly and delicately constituted, the more striking is the diversity. I have seen the skin which was subjected to the flannel, pale, withered, and papillated, resembling that of a picked fowl, the flesh soft and non-elastic; while the surface of other parts of the body was smooth, even and decidedly less pale, and the muscles were firmer and more elastic. I have seen this skin affected extensively with erysipelatous or pustulary eruptions, while that not subject to the flannel remained undiseased.

604. Some of my first observations in this particular, were made on my own person in early life, when I wore flannel as prescribed on account of my tuberculous diathesis; and the indications stated, as well as

others, induced me to believe it injurious. I subsequently experimented, by wearing flannel on but one arm at a time; in this way it effected changes of the same character as above described. (603.)

These occurrences were in the time of my apprenticeship, and in the early period of the practice of my profession; and it was at about this time that I was first struck with the fact from statistical reports of mortality, that, "at the south the proportion of deaths from consumption was greater than to the north." (591.)

605. The coincidence was so remarkable, that it impelled me to connect their relation to each other somewhat in character of cause and effect. It was but a few years prior to this that flannel had come to be almost universally worn *through summer in the south*; and prior to this epoch, for a period of more than 2000 years, it had been the universal belief of the world, that a southern climate was of a less consumptive tendency than a northern. An impression the reverse of this has ever since been gaining ground; until the fact has latterly become matter of demonstration.* (589, &c.)

606. The coincidence of this change, with the universality of the use of flannel, is worthy, I con-

* The facts which are conclusive in this demonstration, it may be observed, had reference especially to soldiers in the British service. I have been informed on reliable authority that British soldiers on tropical stations are required to wear flannel by a standing order of the war department. However beneficial this may be in prevention of other diseases, I think it would seem from the premises to be decidedly otherwise with regard to phthisis.

ceive, of more consideration than the medical profession has given it; especially in the absence of any other known change, to which such a revolution could be ascribed. It is at least worthy of being inquired into: 1st, Whether our ancestors have been, through all time, mistaken? 2d, If not, whence the change? And 3d, if from the habitual use of flannel, whether this is from the increased temperature consequent to this addition to ordinary clothing; or whether it is attributable to the perpetual irritation produced upon the skin by the nature of the fabric? or is it to be ascribed to the combined influence?

607. That flannel acts medicinally and most efficiently so, too, I have had various evidences, from its efficacy in the removal of catarrh, pneumonia, rheumatism; and on some occasions, of inflammatory complications in phthisis. The surpassing efficacy, too, of the flannel bandage in gastro-enteritic diseases, is, or ought to be, familiar to every one. Those are evidences of considerable medical efficacy; and if with such alterative power it is harmless in health, it possesses the peculiarity of being the only known medicinal article that is so. (385.)

608. The modus operandi of flannel coincides not unaptly with the following ascribed by Prof. Cross to tropical temperature:

“The chief difference,” says he, “between tropical latitudes and temperate, or cold climates, consists not so much in the *intensity* as the *duration* of the *heat*. In the latter the mercury frequently ascends nearly as high as in the former, but it does not last so long. The heat of the day continues a greater number of hours, and the summer embraces a greater number of

days in the latter than in the former. This, therefore, keeps the skin in a state of almost *uninterrupted excitation*, and *abundant and protracted sweats that follow*, is, of course, a source of *debility*."

"In consequence," says he, "of the centrifugal direction thus given to the fluids, phthisis, according to M. Cruz Jobins, is much more frequently terminated by *colliquative sweats*, than by colliquative diarrhœas; the latter being a more common accompaniment of phthisis in cold climates than the former."*

609. So, too, is the effect of flannel to be ascribed more to the "*duration*" than to the "*intensity*" of the *heat*; and the "*debility*" which it induces is attributable to the "*uninterrupted excitation, and abundant and protracted sweats that follow*." And this centrifugal tendency we find constantly productive of costive habit with wearers of flannel; and it is chiefly to this mode of operation that we are to ascribe its efficacy in cholera infantum, and other gastro-enteritic disorders. But to combine with the well-known debilitating effects of an excessively hot climate, an apparel adapted to produce artificially, in whatever degree of approximation, a similarly hot and debilitating temperature, for treatment of the *debilitated*, may be very sound *homœopathic therapeutics*, but it comprises a philosophy which to me seems unreasonable and absurd.

* Western and Southern Medical Journal—italicisms by author.

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Introduction, showing the scope of the work, and the plan of the book. It also contains a list of the principal authorities consulted, and a list of the principal terms used in the work.

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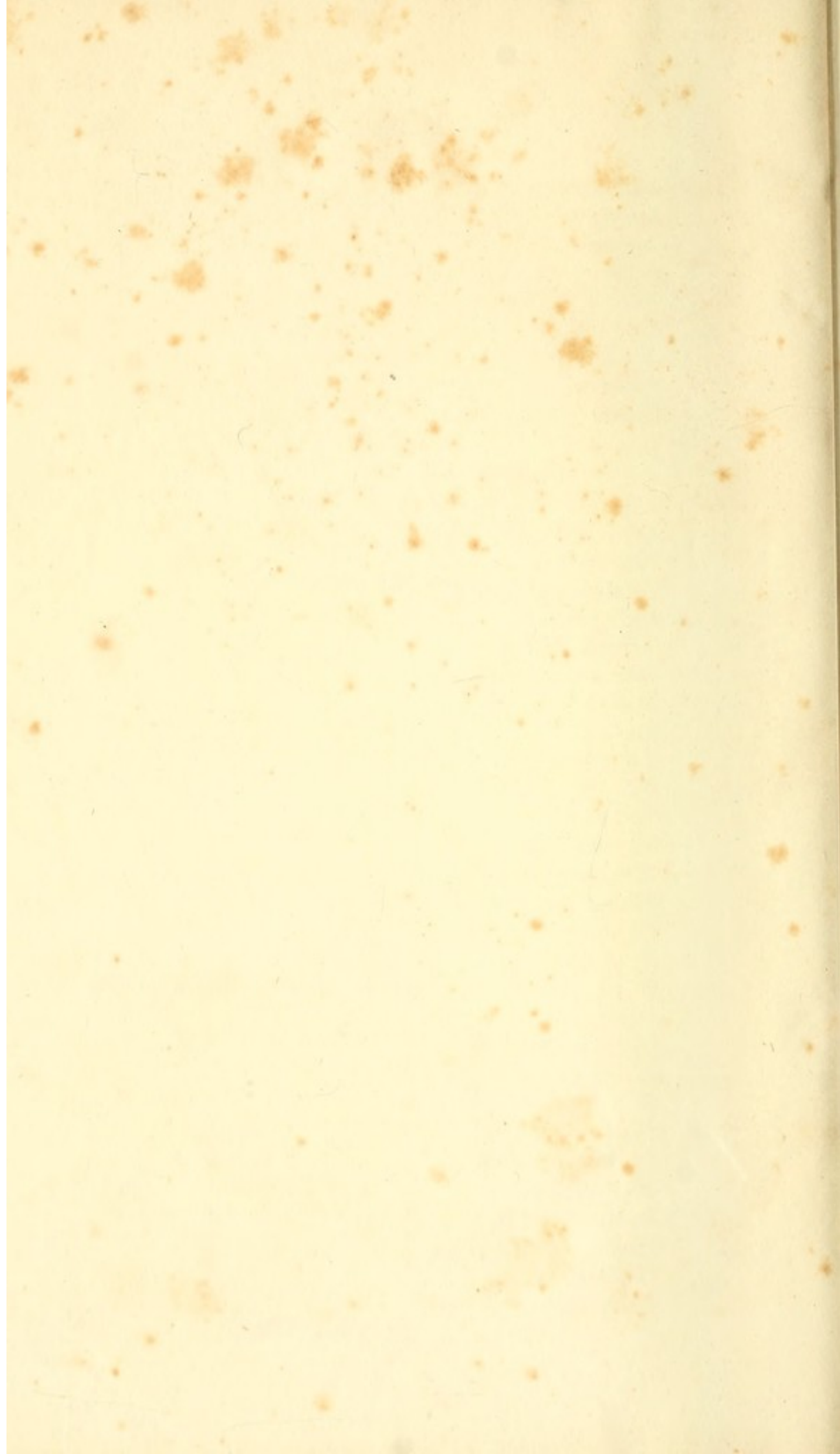
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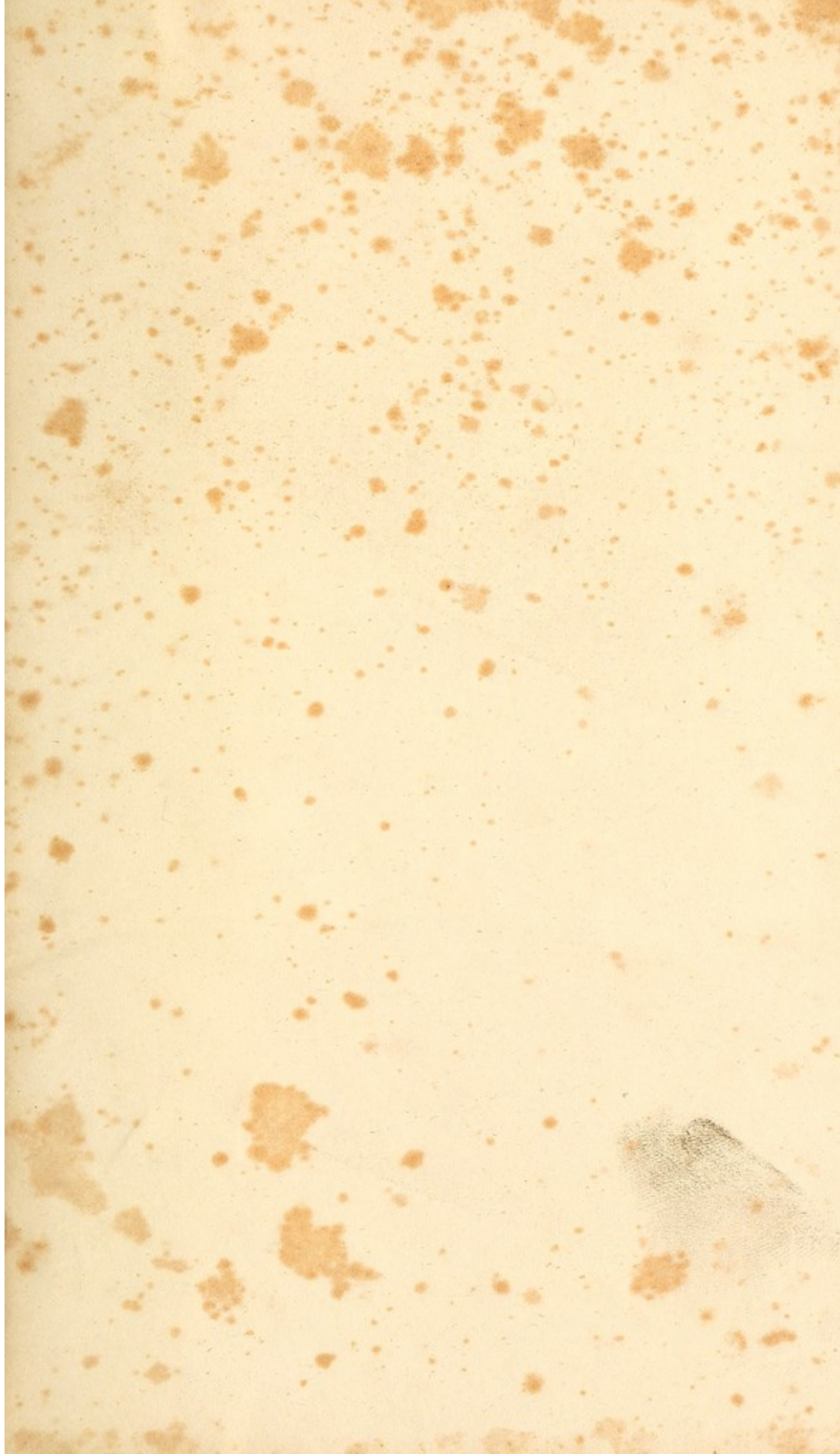
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