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PULMONARY CONSUMPTION:

ITS PREVENTION & CURE

ESTABLISHED

ON NEW VIEWS OF THE PATHOLOGY OF THE DISEASE.

BY

HENRY GILBERT,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON.

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1842.

THE ELEVATED RANK SO LONG AND SO DESERVEDLY

MAINTAINED IN THE PROFESSION

BY

JOHN GREEN CROSSE, ESQ., M.D., F.R.S.

SENIOR SURGEON TO THE NORFOLK AND NORWICH HOSPITAL,

JUSTLY ENTITLES HIM,

ON PUBLIC GROUNDS,

TO THE INSCRIPTION OF ANY WORK WHICH PROFESSES TO TREAT OF

THE REMOVAL OF DISEASE OR THE ALLEVIATION

OF HUMAN SUFFERING:

THIS VOLUME

Is dedicated

TO HIM, WITH SENTIMENTS OF THE MOST PROFOUND RESPECT,

BY HIS GRATEFUL PUPIL,

THE AUTHOR.

London.

PREFACE.

Some apology is requisite for publishing another book on the subject of pulmonary consumption, so many works, and several of them possessing sterling merit, having already appeared before the public. When, however, the rapid advances of pathological science, and the continual improvements daily making in its several departments, are taken into account, it will not at all appear extraordinary that a new work should come out on the very important and engrossing subject of pulmonary phthisis—a malady which interests so large a proportion of the inhabitants of these countries, that any advance made in the knowledge of its pathology, and consequently of its treatment, cannot fail to excuse, and even justify, the confidence of an author in thus venturing on an arena already occupied by so many and

such distinguished pathologists. The new views in the pathology of phthisis now for the first time presented to public notice in this essay, have been the result of close and unremitting attention to the disease for some years, partly in this country, and for some time in Paris, in the clinical wards of the celebrated Louis. One thing must at all events be conceded, namely, that if my views possess no other recommendation, they possess at least that of novelty and originality; at the same time that the method of preventing the disease, as well as of treating it, when established, deducible from my notions of its pathology, cannot but tend to promote the health of the patient, and to retard the progress of this distressing and hitherto irresistible malady, even though these views may not as yet be stamped with the approving seal of my professional brethren. By some it will doubtless be deemed extraordinary, nad perhaps redolent of something very like transcendental vitalism, thus to invest, as I have done, with all the attributes of personality, and almost of perceptivity, those hitherto slighted beings, whose existence has been too long deemed rather metaphysical than real,—I mean, the LACTEAL VESSELS,

those active agents of nutrition, and supporters of the body corporal. True it is, that I lay it down as the grand and prominent feature of my pathology of phthisis, that it consists *primarily in a want of discriminating power in the mouths of these vessels*, whereby they are so far changed from their natural state, as to admit those inorganizable parts, the residue of the materials of nutrition, which in their normal and healthy state they instinctively rejected. In thus endeavouring to trace the origin of this disease, too often considered local, I am borne out by many bright examples in the profession. The mischief of confining our views of phthisis to the mere cavity of the chest, and of looking no farther, appears of late years to be recognised by those who have written on this disease. These gentlemen have insisted on the importance of attending to the function of digestion in the treatment of this disease; a point of paramount importance, it must be admitted, but not more so in phthisis than in many other serious diseases; they have, however, as it were with one accord, stopped short of what I conceive to be the true origin of the disease; they have gone only as far as the deterioration of the function

of digestion; I have gone farther, to the function of nutrition; a view of the subject which, though perhaps hypothetical, is much better supported by facts, as also by the results of treatment, than any of those which have preceded it. There is one point in the pathology of phthisis which still requires clearing up: it is, whether the process of ulceration is absolutely necessary for the dislodgment of tubercles from the lungs. The solution of this problem is beset with many and serious difficulties; the chief difficulty being referable to the consideration as to whether tubercular deposits are so far removed beyond the precincts of vitality as to be exempted from the influence of the agents of absorption. The solution of this important question would contribute much to modify and improve our present views regarding the treatment of this disease. In thus presenting these my views of the pathology and treatment of phthisis, I trust that my desire to contribute my mite to the alleviation of human suffering will plead my apology with my professional brethren.

London, June, 1842.

CHAPTER I.

STATISTICAL OBSERVATIONS ON CONSUMPTION.

"Pallida mors æquo pulsat pede
Pauperum tabernas, regumque turres. O beate Sexti,
Vitæ summa brevis, spem nos vetat inchoare longam."

HORACE.

THE very general want of information, on the part of the public, with respect to the vast and awful mortality annually resulting from pulmonary consumption, renders it necessary to enter somewhat at length into its statistical history, before we consider either its pathology or treatment. By tracing out the fatality consequent on this disease, in some of our large cities, and in counties remote from each other, we shall be better able to form an opinion as to the influence which locality and its concomitant circumstances may possess over it. Considerable interest must also attach to the inquiry as to how far the production and extension of this disease may be influenced by variety of climate.

This last subject will be rendered very clear by considering respectively the influence of sudden transitions of temperature, as well as the effects of cold, heat, humidity, and dryness, on this disease. To these might be added many other advantages likely to accrue from statistical inquiries, such, for example, as the influence of certain occupations, of sex, and of age.

I cannot help noticing the vast importance of the present subject to insurance societies. They who speculate on human life ought certainly to be familiar with the circumstances which tend to shorten it; and a statistical history of consumption must therefore claim a leading place among the data on which they form their calculations.

I have often been astonished when I contrasted the terror struck into mankind by the occasional appearance of some devastating epidemic, more especially when it ran its course in a short period, with the apparent apathy and cold indifference with which they look on at the frightful and equally certain, though slower havoc, daily committed by this insidious scourge. Were cholera or fever to break out in this metropolis to-morrow, every family, possessing the means, would precipitately abandon

the town, and while securing themselves from the inroads of danger, and even when in some safe retreat, would not fail to lament the fate of those left behind. Here the fear of contagion very naturally creates alarm for their own safety, but still the praiseworthy and humane feeling of pity for those necessarily exposed to its influence, does not cease when they themselves are remote from danger. Might we not naturally expect that a similar spirit of commiseration would display itself, in behalf of the thousands that are annually falling victims to that never-ceasing, and hitherto most mortal, of all maladies—pulmonary consumption? Were cholera to manifest itself, public measures would be instantly adopted to protect life; but consumption is permitted to ravage our cities, and carry off whole families, without resistance or apparent regret. With the exception of two small and poorly-supported Infirmaries, in London, whose means of relief are totally disproportioned to the counteraction of the ravages of this dire malady, there exists not in Great Britain a single institution exclusively devoted to its treatment, whether preventive or curative.

The only charitable mode of accounting for such

extraordinary apathy on the part of the public is, by admitting the almost universal dearth of information which exists with respect to the awful devastation committed by this disease. I shall, therefore, endeavour to give further publicity to the mortality resulting from consumption, by circulating more widely some facts which, from their nature and undoubted authenticity, will, I sincerely trust, induce those who are blessed with the means, to assist their less affluent countrymen, in escaping from the most disastrous of all the maladies to which flesh is heir.

PART I.

MORTALITY FROM CONSUMPTION.

There is no disease so universal, and none so mortal, as consumption of the lungs. According to the best data, it has been calculated, by medical men, that it causes one-fourth part of all the deaths occurring from disease in Great Britain and Ireland. Among the many who bear testimony to this startling fact, I might name Dr. Young and Dr. Woolcombe. Dr. Abercrombie, of Edinburgh, whose observations are generally very correct, says: "Deaths from consumption, in the British

islands, have been calculated, on the most moderate computation, at one-fifth of the whole mortality, and there is much reason to fear that the evil is increasing."* Here the calculation is in regard to the whole mortality, and were it in relation to the deaths from disease only, one-fourth part might be assumed as the proportion, as calculated by Dr. Young and Dr. Woolcombe. The testimony of medical evidence is therefore very unanimous; but even if we discard the opinion of the profession, and take official reports as a guide, we shall still find the preceding statement confirmed.

The Annual Reports of the Registrar-General of Births, Deaths, and Marriages, drawn up in compliance with the Registration Act, furnish us with the most accurate statements of the causes of death, throughout England and Wales, that have hitherto been collected. I shall therefore avail myself of the First Annual Report, as presented to both houses of Parliament in 1839, by command of her Majesty.

The total number of deaths registered in England and Wales, from July 1st to December 31st,

* Edinburgh Medical and Surgical Journal, vol. xvii. 1821.

1837, both inclusive, amounted to 148,701. Of this number, 27,754 were the result of consumption of the lungs, of whom 12,968 were males, and 14,786 were females. We therefore find that, according to this authentic report, consumption caused twenty per cent. of the total number of deaths, thus confirming Dr. Abercrombie's opinion, that one-fifth part of all deaths are the consequence of this fearful malady. But if we take away 12,691 deaths from old age, and 4845, which were violent, in all 17,536, we shall then find that consumption produced upwards of a fifth part of all those which resulted from disease, thus bearing out the opinion of Dr. Young and Dr. Woolcombe, that one-fourth part of the deaths occurring from disease is the result of phthisis. The whole evidence is therefore singularly unanimous.

According to the Report of the Registrar-General, pulmonary consumption destroyed more human lives during the six months referred to, than did cholera, influenza, small-pox, measles, ague, typhus-fever, hydrophobia, apoplexy, hernia, colic, diseases of the liver, stone, rheumatism, ulcers, fistula, and mortification !

For the satisfaction of the inquisitive reader, I shall give the mortality resulting from each of these diseases, during the six months already referred to, and, when I have placed them in juxtaposition, shew the difference between the number of their victims and those of phthisis.

EXTRACT from TABLE A, contrasting the Rate of Mortality from Consumption with that from Sixteen other Diseases :—

DISEASE.	MALES.	FEMALES.	TOTAL.
Cholera - - -	246	214	460
Influenza	220	264	484
Small-pox - - -	3,050	2,761	5,811
Measles - -	2,340	2,392	4,732
Ague -	39	37	76
Typhus Fever -	4,439	4,608	9,047
Hydrophobia - -	13	3	10
Apoplexy - -	1,447	1,264	2,711
Hernia - - -	150	102	252
Colic - - - -	39	19	58
Diseases of Liver -	1,018	891	1,909
Stone - - -	161	19	180
Rheumatism - -	221	216	437
Ulcers - - - -	37	45	82
Fistula - - - -	39	12	51
Mortification -	305	276	581
			26,881
Consumption - -	12,968	14,786	27,754

By the above table it is shewn, that from July 1st

to December 31st, 1837, pulmonary consumption destroyed eight hundred and seventy-three more lives than did all the other diseases in this list combined. Such a fact needs no comment; for it at once points out as strongly, as it does clearly, to those who feel an interest in the protection of human life against what malady their efforts ought to be most particularly directed. There surely can be no more satisfactory evidence required in proof of the mortality, whether absolute or relative, occasioned by consumption.

We cannot flatter ourselves into apathy by denying the authenticity of the Registrar-General's Report, as from the care which each individual local Registrar is compelled to use in registering a death, we may infer that we are now furnished with information as near the truth as it is possible to arrive. This vast mortality from phthisis may appear surprising to those who have not hitherto attended to the causes of death; still the above facts cannot be controverted. It may startle the consumptive invalid, nevertheless the truth will hold good.

But additional interest and much useful infor-

mation may result from inquiring into the influence of certain localities, in diminishing or increasing the mortality from this disease, and in so doing, let us commence with the metropolis.

The total number of deaths that occurred in this vast city, from July 1st to December 31st, 1837, both inclusive, was 24,959, being nearly at the rate of one every ten minutes. Of this number 3877 were the consequence of consumption, namely 1947 males, and 1930 females, so that London loses about one soul every hour throughout the whole year by this malady. One circumstance must, however, be observed: we have already seen that phthisis produces twenty per cent. of the total number of deaths occurring in England and Wales, or in other words, that every fifth death, from whatever cause, is the result of this malady. But from the statement relative to London individually, we perceive that here scarcely every sixth death is produced by consumption. Although large cities are proverbially unhealthy, and pulmonary affections generally considered to prove very fatal in such localities, nevertheless, there are few towns or rural districts so free from phthisis, in proportion to their population, as

London. I am also perfectly satisfied that phthisis takes longer time to run through its stages, in the metropolis, than in many of the most healthy rural districts, and there can be nothing more unwise than for those who are unhappily afflicted with this malady, to leave town for country air. If they can afford, in the commencement of the disease, to go abroad, and remain in some clime where the temperature is moderate, but, above all, regular, with an atmosphere impregnated with moisture, then the change may prove useful, but to repair to the country districts of England is decidedly unwise. Devonshire is often selected as a retreat for the consumptive invalid, but we shall best arrive at the true value to be placed on such a fashionable resort, by comparing the number of consumptive deaths occurring there with the whole, so as to obtain their relative proportions, and then contrasting them with those of London.

From July 1st to December 31st, 1837, both inclusive, there were 4801 deaths in Devonshire. Out of this number 835 were the consequence of phthisis; namely, 389 males and 446 females. Thus we find, that of the deaths occurring in this favourite retreat for the consumptive invalid,

one-fifth were the result of consumption, whereas in the smoky metropolis there were not quite one-sixth. It has been argued by those whose attention I have directed to this subject, that from the salubrity of the climate of Devonshire, invalids repair thither in the last stage of consumption, and falling victims to the malady, consequently cause this great mortality. But, on the other hand, it must be allowed, and I can affirm it, from personal observation, that for one patient who goes to Devonshire for the sake of climate, one hundred come to and remain in London for professional advice; and from their protracted application for relief, often sink under their affliction, and swell the metropolitan bills of mortality in a much greater ratio than can possibly be the case with those of Devonshire, from the comparatively few phthisical patients who repair thither.

In order that we may contrast the proportional number of deaths, occurring from consumption in London, with those in some other large towns, we shall select as examples Birmingham and Leeds.

From July 1st to December 31st, 1837, both inclusive, the total number of deaths that occurred in Birmingham was 1459, of which 354 were the

result of phthisis, namely, 190 males and 164 females. The number of consumptive deaths in Birmingham, as compared with those in London, appears not a little surprising. In the metropolis less than one-sixth of the aggregate mortality is referable to this malady, whereas in Birmingham every fourth death is attributable to its ravages.

During the period above cited, namely, from July 1st to December 31st, 1837, both inclusive, the total number of deaths which took place in Leeds amounted to 1582, out of which 335 were the result of phthisis, namely, 161 males and 174 females. We, therefore, here find the mortality from consumption comparatively great, upwards of a fourth part of the whole deaths resulting from it.

It may not be devoid of interest to contrast some other rural district with Devonshire. For this purpose we shall select Norfolk and Suffolk conjointly. The total number of deaths occurring in these two counties, from July 1st to December 31st, 1837, both inclusive, amounted to 6017. Of these 1306 were the consequence of consumption, namely, 582 males and 724 females. A fourth part of the population would therefore appear

ultimately to fall the victims of this malady in this district; so that pulmonary phthisis may be fairly considered more prevalent in Norfolk and Suffolk than in Devonshire or London.

These illustrations might be extended, so as to embrace almost every district in England and Wales; but on comparing the other counties and towns, I find the results so devoid of any peculiar interest as to render further comment useless.

It may be observed that the absolute mortality from phthisis, in reference to the population, is, according to the Registrar-General's Report, "nearly four annually out of one thousand living."

It is matter of regret, that in Scotland and Ireland there is no annual return made of the number and causes of deaths. We cannot therefore avail ourselves of any authentic document, with the view of ascertaining the relative mortality from consumption in these countries; but, from hospital and dispensary reports, we may infer, that they are not more exempt than England from the visitations of this scourge.

I cannot let pass this opportunity of expressing my grateful acknowledgments to my highly-talented

friend, W. Farr, Esq., for the valuable assistance I have derived from his elaborate statistical researches, from which, not only the medical profession, but the public generally, cannot fail to obtain much curious and useful information.

The inference to be drawn from the preceding statistical observations on the mortality from consumption is, that every fifth death occurring in Great Britain and Ireland is the consequence of this disease; and if we exclude deaths from old age and unnatural causes, every fourth death is the result of this malady. We also see, that although one-fifth part of the total mortality is attributable to this disease, nevertheless that some districts are not so subject to it as others—a circumstance which may be ascribed alike to climate, the habits, occupations, and modes of life of the inhabitants.

If these facts relative to the vast destruction of human life, consequent on phthisis, are not sufficient to arouse public attention to adopt measures for the protection of life from this scourge of humanity, nothing will ever do so. Comment must consequently be useless, if these glaring facts

fail in eliciting compassion; I therefore leave the subject.

PART II.

INCREASE OR DECREASE OF CONSUMPTION?

It may very naturally be asked, whether or not the mortality from phthisis is on the increase or decrease. In order to answer this question with any degree of accuracy, we should not only require to be furnished with correct bills of mortality for such a number of years as we include in our calculations, but, in addition to these, we ought to have a return of the population for each year during that period. As we are not in possession of documents on which reliance can be placed, this question must remain unsettled, further than the vague and wide calculations we may deduce from former reports.

It has been argued, that the method of calculating the relative mortality, as compared with that from all diseases, is wrong, and that we ought to take the absolute mortality in reference to the population. This is, no doubt, strictly correct; for some seasons when phthisis has been unusually fatal, the proportion of deaths from this cause, when compared

with the total number, has appeared small. An epidemic, such as cholera, may swell the bills of mortality so much, as to render the proportion of deaths from phthisis comparatively small, although, in fact, the absolute number of such deaths may have been in reality unusually great. Nevertheless, by extending our observations over a number of years, we shall arrive very near the truth, even by discarding the population, for we all ultimately fall the victims of disease, if we except the few instances of unnatural deaths; for even where a demise is ascribed to old age, nevertheless some organic or functional disease is the direct cause. And fatal epidemics are so rare, and generally so confined to districts, as scarcely to influence the accuracy of our calculations made by taking the relative mortality from consumption, as compared with that from all other causes. As all mankind must ultimately be swept from this terrestrial scene by the stream of mortality, the proportional share which phthisis has hitherto taken, and still takes in this office, must, if carefully attended to, bring us very near the truth, in solving the problem under consideration.

It must be obvious that the personal experience

of any medical man can throw no light on the subject, beyond the variations occurring in his own field of practice during the few years of his professional life. If, therefore, we wish to compare the gradual variations in mortality from phthisis as they occurred during past ages, we must necessarily depend on former reports, while to arrive at a knowledge of the relative mortality between these periods and the present time, we can only contrast our recent reports with those which our predecessors have left.

We are furnished with a most valuable work on Statistics by J. Marshall, Esq.,* which, in addition to much other truly important information, shews the annual mortality in the metropolis during a period of two hundred and four years, namely, from 1629 to 1831, both inclusive. In his tables he has also specified the causes of death; consequently there is, perhaps, no more valuable guide than this, on which we can rely for the information now sought. Availing ourselves of this work, we shall go back to the year 1629, and calculate the proportional share of deaths

* Mortality, &c., of the Metropolis, by J. Marshall, Esq , London, 1832.

produced by consumption, from that period, during intervals averaging ten years, up to 1830:

YEAR.	TOTAL NUMBER OF DEATHS.	DEATHS FROM CONSUMPTION.	PROPORTION FROM CONSUMPTION.
1629	10,554	1,827	One-fifth.
1647	14,059	2,423	One-fourth.
1657	15,046	2,757	One-fifth.
1667	15,842	3,087	One-fifth.
1677	19,067	3,272	One-fifth.
1687	21,460	3,473	One-sixth.
1701	20,471	2,678	One-seventh.
1710	24,620	2,706	One-ninth.
1720	25,454	3,054	One-eighth.
1730	26,761	3,728	One-seventh.
1740	30,811	4,919	One-sixth.
1750	23,727	4,543	One-fifth.
1760	19,830	3,776	One-fifth.
1770	22,434	4,594	One-fourth.
1780	20,517	4,889	One-fourth.
1790	18,038	4,852	One-third.
1800	23,068	5,721	One-fourth.
1810	19,893	5,427	One-third.
1820	19,348	3,959	One-fourth.
1830	21,645	4,704	One-fourth.

From the above table we may infer, that pulmonary consumption has of late years decreased in the metropolis; for, from the year 1770 up to 1830, it averaged one-fourth, and sometimes as high as one-third of the whole mortality, whereas now and

for some years back, it has not exceeded one-sixth. The variations occurring during the period embraced in the table are, however, very considerable, and shew that in 1701, 1710, 1720, and 1730, the deaths from phthisis were proportionally fewer than they even are now. Sir James Clark, in his Treatise on Consumption, gives a table, constructed from data contained in Mr. Marshall's work on the Mortality of the Metropolis, and remarks that "from 1700 to 1750 the deaths from consumption increased from four to six in every thousand of the population," and that since the last period they have remained stationary. But in coming to the conclusion that this disease has increased, he must surely be aware that he has selected, as a period of comparison with subsequent dates, one when the number of consumptive cases was singularly low. Had he gone back for a few years, he would have found the number of phthisical cases averaging one-fifth of the whole, and in 1687 they were, as at the present time, one-sixth.

Dr. Heberden states that consumption was on the increase in the eighteenth century, which certainly is indisputable, as the table I have con-

structed shews; but if his object was to prove, from former changes, whether or not the disease was likely to become more or less frequent, he, like Sir James Clark, made a most unfortunate selection as to time, and affords an instance of the errors we are liable to fall into by restricted observation. I shall, however, give his observations on the period he refers to. He says, "The following statement was deduced, in a coarse manner, from an average of about ten years, for the purpose of comparing, generally, the mortality occasioned by certain diseases, at the beginning, middle, and end of the eighteenth century, care being taken, in each period, to select such years, in which the whole number of deaths was nearly the same, namely, about twenty-one thousand."* In regard to consumption, his table exhibits the following statement for these three specified divisions of the eighteenth century :—

	BEGINNING.	MIDDLE.	END.
Consumption	3000	4000	5000

* Heberden, Jun., Observations on the Increase and Decreaseof Different Diseases. London, 1801.

These illustrations, it must be observed, are restricted to the metropolis, and we have no documents from which we can draw any conclusions as to the increase or decrease of consumption throughout the whole of Great Britain.

From my own personal observation, as well as from the statements made to me by many practitioners, in various parts of the country, both in England and Scotland, I am inclined to believe, and, in fact, entertain no doubt, but that during the last ten years the disease has increased among some ranks of society, while it has decreased among others. On the whole, therefore, we may reasonably infer, that although London does not now lose so great a proportion of her inhabitants by this scourge, nevertheless the general mortality occasioned by it, throughout the kingdom, seems to continue unabated.

PART III.

CONSUMPTION BEING ON THE INCREASE AMONG SOME CLASSES OF SOCIETY, WHAT RANK, IF PARTIAL, DOES IT CHIEFLY ASSAIL?

This is a question which it would be impossible to solve by means of official reports, for the Re-

gistrar-General does not, of course, specify what number of phthisical cases belongs to each of the artificial grades into which society has been divided. The united observations of professional men, or an annual statement from the local Registrars on this subject, can alone settle it. As far as my own experience goes, I am disposed to think that the partial increase of consumption has chiefly occurred in the upper classes of society, and more especially among females ; while among the lower classes the malady seems to have become less frequent. This may, perhaps, be accounted for by taking into consideration the greater comfort now enjoyed by labourers and the poor, which classes constitute so great a proportion of the population ; while the rich, to gratify the morbid fancies of the age, indulge more and more in pernicious and unnatural luxuries, which gradually produce a tendency to disease. We see that this malady is not even heard of among some nations, where the arts of refinement and the luxurious practices of civilised life have not as yet obtained a footing. Dr. Benjamin Rush, of Philadelphia, speaking of pulmonary consumption, says, it is " unknown among the Indians

of North America."* Sydenham remarked, that acute diseases come from God, but chronic diseases originate with ourselves, or, to use his own words, "Morbi acuti Deum habent autorem, chronici ipsos nos."

Sir James Clark's opinion is so far confirmatory of mine, as to the partial change which has taken place, in regard to the increase of phthisis among the wealthy. He says, "Whether tuberculous diseases have diminished or not during the last half century among the labouring part of our population, I am of opinion that they have increased in the middle and upper ranks."†

PART IV.

INFLUENCE OF CLIMATE ON PULMONARY CONSUMPTION.

In treating this part of the subject, we must, in the first place, consider the influence of climate in producing the disease ; and, secondly, its influence in exciting the malady in those predisposed, as also its effects on consumption already existing.

An opinion has been very generally entertained,

* Medical Inquiries and Observations, by B. Rush, M.D., vol. i. p. 159.

† Treatise on Pulmonary Consumption, by Sir James Clark, M.D., p. 10.

that certain climates will produce pulmonary consumption; and an attempt has been made to discover, by reference to the statistical reports of Great Britain, and, by contrasting this nation with other countries, some evidence of a regular and universal law on the subject. Although such result was anticipated, and although industry and talent have conjointly embarked in this voyage of discovery, still the result has been extremely unsatisfactory. Sir James Clark observes, that "the facts relating to the prevalence of consumption in different nations, which I have been able to collect from their statistical documents, are so discrepant, that no positive conclusion can be drawn from them to shew the influence of climate in producing the tubercular diathesis." * Another author says, in reference to the influence of climate on this disease, that, "on no subject has more been written, or less satisfactory information been obtained."†

The question may, therefore, be reasonably put —Why has there been such a lack of success attending this inquiry? I would answer it by putting a second. I would ask what grounds there

* Op., cit. p. 204. † Louis on Phthisis, by Cowan, p. 346.

exist for anticipating any better result? The answer to this is easily given, and a correct one, moreover, it is—because erroneous views of the pathology of consumption (as will, I think, appear evident in the following chapter) have been entertained in our schools, and adopted by the profession. False premises have been proceeded on, and therefore no satisfactory termination could be expected. These erroneous views have misled each succeeding race of medical men, a circumstance which clearly shews the danger of placing implicit reliance on any assertion merely because it comes from a great man. The motto of every medical practitioner should be—

"Nullius addictus jurare in verba magistri."

My opinion is, that till such time as the seeds of consumption are absorbed by the lacteals, climate can have no influence whatever in producing the disease, and it matters not whether it be hot or cold, moist or dry, changeable or regular. A changeable climate, or one too dry, may no doubt induce pulmonary disease, but can never produce consumption, till such time as the seeds of that malady are absorbed, and circulate with the

blood. The pathology of phthisis bears me out in this statement, which is, moreover, confirmed by daily observation, and, in my opinion, rendered indisputable. But when the seeds of the disease are once absorbed and circulate with the blood, or when they are deposited in the lungs, and consumption actually established, then, but not till then, does climate possess great power, alike in producing the local disease, and in modifying it when existing. The farmer is well aware that a warm temperature, with a moderate quantity of rain, encourages and favours the growth of corn, when once the seed is deposited in the earth ; but he would never expect a favourable climate to raise grain till such time as the seed was sown. And till the seeds of this malady are in the system, climate, in like manner, cannot act upon them.

My assertion, that climate has no influence in producing consumption till such time as some other cause has predisposed the system to the disease, may be rendered still more manifest, by considering respectively the connexion between a changeable temperature, cold, heat, humidity, dryness, and pulmonary phthisis. In doing so, not

only will the opinion just offered be confirmed, but the nature of the climate best calculated for the safety of the consumptive invalid will be determined.

The organs of respiration are exposed to the influence of thermometrical and barometrical changes, which subject them to extreme hazard. When we consider the delicacy and high sensibility of the membrane lining the air passages, we may readily conceive that effects the most marked will be produced on it by atmospheric changes, and the more especially if such changes are sudden. Let us only consider for a moment the effect of a quick transition from heat to cold on the skin. In defiance of clothing, it produces corrugation of its tissue, stoppage of the cutaneous excretion, with a tendency to internal congestion. If the skin is thus magically, as it were, acted on by change of temperature, are the lungs not very much more likely to suffer from the same cause? Organs, at once the most delicate and sensitive, without any intervening substance between them and a changeable atmosphere, are coming, from fifteen to twenty times every minute, in direct contact with fresh supplies of air, the vehicle of a changeable temper-

ature, which will produce effects on their structure and functions much more marked than on the skin.

The membrane lining the air passages is in consequence irritated, the air-cells contracted, the circulation rendered irregular, and if these causes are long continued or often repeated, every function will become impaired. The irritation produced is often followed by acute inflammatory action in the lungs. There is, consequently, a greater quantity than natural of blood forced into the small vessels, and along with it a proportional share of the seeds of consumption. Here they are deposited; and now the disease exists in its first stage. In this way does a changeable climate tend to multiply the number of consumptive cases. And if the malady already exist, such a change of temperature must obviously tend to aggravate it, by inducing a greater proportion of inorganizable matter to settle in the lungs, in addition to which, suppuration will advance more rapidly, in consequence of the irritation and inflammatory action induced by these transitions.

I shall only here remark, that the transitions

most unfavourable to those predisposed to consumption, or to such as are actually labouring under the disease, are, from moderate heat to severe cold, and from humidity to dryness. This will appear obvious, from the following remarks offered on these subjects. We may, therefore, derive some advantage from considering the influence of thermometrical and hygrometrical extremes on phthisis.

Cold.—In cold countries, such as Russia, consumption is a disease comparatively little known. This is a well-attested fact, and confirmed beyond doubt. I may, in proof, quote one authority, Sir Alexander Crichton, who observes, that "consumption is infinitely more frequent in Great Britain and Ireland, in comparison to their population, than in the northern parts of Russia; yet the climate of Russia is in general infinitely colder and ruder than ours." The Canadian winter is bitterly cold, but there consumption, or, in fact, any disease of the lungs, is rare, the temperature being very uniform. Sweden is also comparatively free from this malady. Mr. Marshall, in his work already quoted, gives a table, shewing the mortality in

each of the twenty-four provinces of this country, and in the city of Stockholm, in the year 1820, in which table he exhibits the various diseases from which the mortality ensued. From this account it appears, that during the year referred to there were 31,572 male deaths, of which number, only 3110 were the result of consumption; being only one-tenth of the whole. Out of the female population there occurred 31,358 deaths, of which 3195 were from phthisis; constituting one-ninth part of the whole. But we have found, that in England, where the winter is by no means so cold, every fifth death is the consequence of this disease. We may, therefore, upon clear evidence, infer, that cold has no tendency to induce consumption, if regular and uniform, a fact coinciding with an opinion already expressed, and confirmed by the views of its pathology hereafter to be considered.

It must, however, be kept in mind, that when the disease is established, cold has an obvious and decided effect on its progress. We lose a greater proportion of our consumptive invalids during the winter months than in any other season of the year. This may be easily proved from the

tables furnished us by Dr. Heberden. He gives a statement of the mortality from consumption, in London, during a period of ten years, namely, from January, 1763, to December, 1767, and from January, 1795, to December, 1799, these years consequently inclusive. The facts were extracted by him from the weekly bills of mortality, and shew the variations every week, during the whole period. The following is a statement of the whole number of deaths from phthisis during the ten years, shewing the months when they took place :—

January	4363	July	3249
February	4527	August	2825
March	4634	September	2994
April	4227	October	3521
May	4043	November	3711
June	3604	December	4516

We therefore find the occurrence of death from consumption more frequent during the winter than summer months. The variations, during the four seasons of the year, are as follow :—

Winter	13,406
Spring	12,904
Autumn	10,226
Summer	9,678

In countries where the winter is not so severe as in Great Britain, the spring is generally most fatal

to the consumptive patient. This has been illustrated by M. Benoiston, as follows. Out of 12,668 deaths from phthisis, occurring at Milan, Paris, and in the adjacent country, the proportion in the different seasons was as follows :—

Autumn -	3001	12,668
Winter	3109	
Spring	3482	
Summer	3076	

No advantage can result from dwelling longer on this subject. The fact, I believe, must be admitted, that cold can have no influence in producing phthisis, but, if great, is very injurious to those already suffering from the malady.

Heat.—Heat can have no more influence in the production of phthisis than cold, but when the disease has reached its last stage, it then accelerates its progress. This fact has attracted the notice of many eminent professional gentlemen, and has been noticed more particularly by Dr. Simmons * and Sir Gilbert Blane.† It must be admitted, that the natives of some warm climates are more generally afflicted

* S. F. Simmons's Practical Observations on the Treatment of Consumption. London, 1780.

† G. Blanes' Observations on the Diseases of Seamen. London, 1785.

with pulmonary consumption than those of cold countries. But we must not attribute this circumstance to the influence of heat. A very general error prevails, of taking into consideration only the temperature. We ought also to consider the influence which the habits of a nation exercise over the health, as well as the great changes certain to be effected by the produce of the soil as articles of food. Louis has justly remarked, that "civilization renders the appreciation of climate peculiarly difficult," and it is to be regretted, that those who have written on the effects of climate on health, have not taken collateral circumstances into consideration, an omission that has rendered their remarks comparatively useless, everything being ascribed to climate, though, in many instances, much should be referred to the agency of dress, food, occupation, &c.

Although phthisis is very prevalent in some warm countries, I cannot assign heat as the cause, being clearly convinced, by the pathology of the disease, that it cannot be induced by this agent.

One circumstance tends to confirm my statement, that heat has no influence in the production

of consumption. In the West Indies, it is a peculiarly prevalent disease, and proves quickly mortal. But at the Cape of Good Hope, and in the East Indies, it is comparatively little known. Now, if heat were really so influential an agent in exciting the disease, it would be but natural to expect a comparatively increased prevalence in the latter countries referred to.

Humidity.—The idea that a moist atmosphere is injuriousto consumptive invalids is very generally entertained by physicians, and universally so by the public. The consequence is, that those who possess the means remove to the driest districts of Great Britain, or repair to some sunny, arid clime, as soon as afflicted by this malady. So anxious have some professional men been to discover a climate the most free from humidity, that they have ascertained, with the greatest care and accuracy, the average quantity of rain that falls, in various counties and districts, during the year, and, from their hygrometrical observations, have, no doubt, furnished us with much valuable information.

My opinion is, that there never was a more erroneous or more injurious opinion entertained,

than that humidity is pernicious to consumptive invalids. I am fully convinced that a moist or damp atmosphere tends very materially to the relief of the phthisical, and that the disease is comparatively rare under such circumstances. I have not come to this conclusion from mere theory or supposition, but from repeated observations made in localities differing most widely. For instance, on the west coast of Scotland, and in the adjacent islands, an immense quantity of rain falls throughout the whole year, and the atmosphere is at all times highly charged with aqueous vapour. But, among the inhabitants, consumption is a disease comparatively little known. Again: in many of the driest and mildest counties and districts in England, where the inhabitants should possess the advantage consequent on exemption from humidity, we find phthisis very prevalent.

I am much pleased to find similar opinions entertained by a few medical gentlemen, whose talents and experience merit consideration; and as the subject is one involving very materially the interests of the public health, it may be excusable to dwell on it at greater length, particularly as an

opinion directly contrary to that here offered is so universally entertained. My object is only to elicit truth. I have no favourite whim to indulge and gratify; but, feeling as I have ever done, the sad results that may follow false views of disease, I am anxious to promulgate those which I consider likely to serve the interests of humanity.

Dr. Harrison, in "An Address delivered to the Medical Society of Horncastle, on the Endemic Causes of Disease," has offered some valuable remarks on the subject here treated of. He says—"I had not resided long in this division of Lincolnshire, before I was strongly impressed with an idea, that the inhabitants upon the wolds were a great deal exposed to idiopathic consumptions, and peculiarly liable to calculous complaints. In the division of Holland, and the extensive marshes of our county, these disorders are probably less known, than in most other situations in England. Multiplied experience and numerous inquiries have tended to confirm these opinions."* Again, he observes, "The situation of this town has afforded

* Harrison on the Endemic Causes of Disease. Medical and Physical Journal, vol. viii., p. 221. 1802.

me numerous opportunities to investigate more particularly pulmonary complaints, and I can truly assert, that *they are much less frequent in the fens and marshes than in the upper parts of my circuit.* The difference with respect to idiopathic consumption is very great indeed. In some parts where I practise, it is a very common complaint, and in others it is scarcely known to the faculty. Pulmonary consumptions are certainly to be met with everywhere; but when I have been consulted upon such cases in our marshes, or the division of Holland, I could either trace them to other situations, to neglected cold, or some irregularity in the suffering person."

Mr. Weekes, of Hurstperpoint, in Sussex, has asserted, that in his neighbourhood consumption became more frequent as draining was extended. So long back as the year 1779, the learned Dr. Wells* found out that consumptive patients in Flanders removed to the marshy parts of the country for relief, a circumstance that attracted his attention, and elicited much valuable information from this gifted physician.

* Vide Transactions of Society for the Improvement of Medical and Chirurgical Knowledge, vol. iii. p. 471. London, 1812.

Dr. Speer, of Dublin, has remarked that, " how far humidity, unaccompanied with severe cold or heat, contributes to the production of disease or health, is as yet a point not clearly settled; the latter would with us seem rather to be the case. Dr. Rutty thought our moist seasons the healthiest, at least much freer from epidemics, and his various observations go decidedly to confirm this opinion; this has also been the opinion of other observers since his time, who think that, unless with great variations of temperature, severe cold, and easterly winds, our humid seasons are in general our healthiest. A single proof of this seems to have been furnished in the year 1816, which was remarkably healthy and remarkably wet. Dr. Franklin, and Dr. Percival, of Manchester, conceived that moist seasons are healthier than dry ones, *ceteris paribus;* Sir John Pringle seems to have been of a similar opinion. It is only, therefore, in its combination with extremes and varieties of temperature, &c., that we can consider humidity in its promotion of disease, and even here we know not how far to go."*

* Dr. Speer, on the Diseases of the Lower Orders in Dublin. Dublin Hospital Reports, vol. iii. p. 176. Dublin, 1822.

It is evident, from the statement of Dr. Speer, that so far from humidity tending to induce consumption, it is favourable to health—a circumstance which, in my opinion, does not admit of doubt.

Mr. Thackrah, in a most interesting work, gives a mass of information on the effects of humidity. He observes that, "whether we examine the agency of moisture on men in the open air, or those under cover, we find it much less than common opinion would expect. In this country almost all our maladies are ascribed to the agency of wet, or to 'taking cold.' Medical men adopt this notion. It is consequently heard in their expressions; it constantly appears in their writings. The people, of course, have gradually adopted the medical doctrine, and carry it even further than its founders. A reference, however," continues he, "to the history of cases attributed to wet and cold, and an examination of the reasoning of the patients, are enough to expose the insufficiency of the evidence and the incorrectness of the inference."*

The following passage, extracted from "Mad-

* The Effects of Arts, Trades, and Professions on Health and Longevity, by C. Turner Thackrah, p. 66. London, 1831.

den's Travels," bears upon the present subject, and is worthy of notice. In vol. i. p. 221, he says, "Indeed Alexandria, at all times, is excessively damp; the atmosphere is saturated with a saline vapour, which condenses on the walls and furniture of the houses, in small crystals of nitre, muriate of soda, and muriate of ammonia; the soil is everywhere coated with the saline particles; and although it is quite impossible to keep any articles made of iron free from rust, yet the constant breathing of this saline atmosphere does not appear to be prejudicial to health; *diseases of the lungs are unknown. I have not seen one case of pulmonary consumption among the Arabs.*"*

I think, on the whole, that the evidence I have adduced in support of my opinion, (which has no claim to originality, and therefore the more likely to be correct,) is very conclusive. But still, before leaving the subject, I must refer to the observations of Dr. Lombard, of Geneva, "On the Influence of Professions on Pulmonary Consumption." The following tables, extracted from his paper now

* Travels in Turkey, Egypt, Nubia, and Palestine, by R. R. Madden, Esq. London, 1829.

referred to, tend still further to confirm the opinion I have ventured to express.

The subjoined table shews, from among a number of deaths that took place among professions surrounded with watery emanations, the relative proportion of those that were the result of pulmonary consumption :—

OCCUPATION.	TOTAL NUMBER OF DEATHS.	DEATHS FROM CONSUMPTION.
Weavers	41	2
Dyers	25	0
Tanners	43	4
Watermen	46	3
Bleachers	11	1
Bleaching-women	39	1
Washerwomen	21	1
	226	12

From this it appears that pulmonary consumption is a very rare complaint among those exposed to watery vapour. Let us contrast the relative proportion of consumptive deaths with those among persons whose employment requires them to inhale a dry air. The following table will give us this opportunity, as it shews the total number of deaths

occurring among persons surrounded with a dry atmosphere, and the number from among them that were the result of phthisis :—

OCCUPATION.	TOTAL NUMBER OF DEATHS.	DEATHS FROM CONSUMPTION.
Tool-makers - - - -	22	6
Enamellers - - - -	75	13
File-smiths - - - -	37	4
Founders - - - -	47	0
Blacksmiths - - - -	63	8
	244	31

Dr. Lombard observes, that " the result of this table is, that workmen surrounded by a hot dry atmosphere yield more readily than other workmen, in the proportion of 127 to 114 ; from which it may be inferred, that if a moist atmosphere is a preservative against consumption, so hot dry air may be considered as a cause of the disease." And he afterwards remarks that, " it is probable that the frequency of consumption among certain workmen, as clock-makers, jewellers, watch-case mounters, goldsmiths, &c., depends partly on the high temperature of their choffers, which dries and rarifies the air of their workshops."

I might extend the evidence very considerably, did a treatise of this sort permit, in order to prove that humidity is favourable to the consumptive patient. It appears singular to me that medical practitioners should generally entertain the contrary opinion. They have all seen that ague and consumption rarely occupy the same district, but still they are fearful, as it were, of inquiring into the cause, lest it should alter an old-established, popular, and favourite opinion. Ague is the daughter of humidity, and, to use the words of Dr. Marshall of Lynn, she "will bear no brother near the throne;" but over consumption she rides rough-shod. In proof of this I could bring forward ample evidence. In Minorca, for instance, Cleghorn says, ague is considered as endemic; and there consumption is rare. In Egypt consumption seldom occurs; there intermittents are common. Volney tells us that consumptive patients are frequently sent to the sea-coast, where intermittents may prevail. In Bengal, an aguish country, consumption is rare.*

But if the remarks already offered on this sub-

* Wells' Trans. Soc. Med. Chir. vol. iii. p. 471. London, 1812.

ject are not sufficient to convince the most sceptical, I feel satisfied that a volume devoted to the subject would fail. I shall, however, point out how the bad effects that result from a dry atmosphere may be accounted for, on acknowledged principles, and in this way we may close this part of the subject.

Dry Atmosphere.—A dry atmosphere acts as an irritant on mucous membranes, when they come in direct contact. Humidity, like heat, has a great tendency to equalization, and therefore the moisture which constantly lubricates mucous membranes, evaporates when surrounded by a dry atmosphere, in order that equalization may be favoured. This result calls for increased secretion, and consequently increased action in the vessels of the part must take place. Then follow irritation, inflammation, and its consequences. When such an action takes place in the air passages and lungs of a person predisposed to consumption, or in a patient labouring under the disease, the effects already described in this chapter follow. The smaller vessels become gorged with blood, and if this fluid contain the seeds of phthisis, they

become arrested in their course, and constitute the first stage of the malady. And where the disease actually exists, the irritation produced by the contact of a dry atmosphere, encourages inflammation, and accelerates the suppurative process, the last stage of phthisis.

Observation has confirmed these statements; indeed, we have *ocular* demonstration of the fact. And in order to shew that it is *ocular*, I am informed, that during the summer of 1826, generally termed the dry season, there were many successive weeks during which no rain fell in the mountain districts of Aberdeenshire, and the atmosphere was singularly dry. During this period, inflammation of the eyes was very prevalent—indeed, almost universal — throughout several parishes of that mountainous district. During the same period, coughs were equally prevalent, so that two diseases, little known in that country, were as unexpected as unusual. They, however, disappeared, when the rain returned. But let me, without going so far northwards, come a little nearer the metropolis, and here again I can find a similar result from a

similar cause—a result too, which, occurring in a country more frequently visited than the heath-clad mountains of the north, has attracted more notice. We are told that strangers, on visiting some of the dry parts of Devonshire, are attacked with inflammation of the eyes, which, after a time, disappears. Now, the membranes lining the eyes and air-passages are in their nature exactly similar, and in fact continuous. If the eyes, therefore, are liable to suffer from a dry atmosphere, are not the lungs equally so?

PART V.

INFLUENCE OF OCCUPATIONS IN INDUCING OR PREVENTING CONSUMPTION.

There can exist no doubt but that occupation has a powerful influence over the liability of mankind to phthisis. When we reflect on the pernicious and trying circumstances which attend some avocations, and the gentle and healthful duties attached to others, we may readily conclude that the effects produced on the system will present a corresponding difference. It is not, however, my

province to consider in this treatise the influence of occupation on health generally, or its connexion with the various diseases incident to the human race. Although such an inquiry would be fraught with interest, we have here only to inquire into the power it possesses over consumption.

Occupation (and the consequent modes of spending life) may act in two directly opposite ways, depending on the nature of employment, namely, by tending to induce consumption, or by preventing the attack of the malady. Some trades and employments are attended by such unfavourable and injurious circumstances, as quickly to affect the animal economy, even inducing that morbid organic change described in the following chapter, which leads to the absorption of the seeds of consumption and their ultimate deposition in the lungs. He, therefore, who was by nature constituted the least liable to this affection may, by following some of the arts introduced into civilized life, thwart her very best intentions, and entail on himself the most grievous of human afflictions.

Some occupations and their inseparable attend-

ants, as confinement and impure air may influence their followers in two ways. They may generate a predisposition to phthisis in those naturally the least liable to it, while in others originally predisposed, and having the seeds of the disease circulating in their blood, they may cause their deposition in the lungs, and establish the malady.

Whence let it be observed, that a predisposition to consumption may be induced by such avocations as subject their followers to unnatural and unhealthy modes of living, particularly such employments as are attended by circumstances calculated to impair the action of the organs of digestion, and derange the functions of the alimentary canal. Out of a long catalogue of such employments, might be named such as are sedentary, and others directly the reverse, but which encroach on the natural rest, and are attended with habits of intemperance.

On the other hand, the seeds of consumption once absorbed, the malady will be confirmed by such avocations as tend to induce irritation and increased vascular action, or congestion in the lungs. It must be obvious that such employments as re-

quire the body to stoop, and thereby contract the cavity of the chest, must tend to induce pulmonary congestion, by interrupting the free circulation of blood through the lungs; while those which compel the tradesman to inhale irritating particles or effluvia must induce increased vascular action in the bronchial tubes and pulmonary tissue.

Employments which do not require, but even prevent, the general muscular exercise necessary for health, although their influence be indirect, are nevertheless equally pernicious. In the very commencement of life, future health is often sacrificed in our schools to the barbarous methods of the present day, adopted with the view of teaching refinement. The confinement in schools is equally injurious as that in prisons, and the distinction is only in name, and slightly in degree. Indigestion is a very general consequence, and at a time of life when it is most likely to prove particularly injurious. Dr. Todd may well say that dyspepsia "is, as it were, endemic in the boarding-school,"* and it is an affection almost invariably the forerunner of acquired consumption. But to make

* Cyclopædia of Medicine, vol. ii. p. 615.

bad worse, this disease seldom meets with any consideration in such instances, and is allowed to undermine the health, and but too frequently induces a predisposition to phthisis. Mr. Thackrah has justly observed, that "young ladies, especially, suffer from habits of schools. Their exercise is much too limited. They walk out, it is true, but scarcely at a rate to warm their feet. Their time for amusement is too little; and full romping exercise, exercise which brings all the muscles into play, is discouraged; it is vulgar to use the limbs as nature designed; it is vulgar to take food which nature requires; and young ladies must not do anything that is vulgar." This statement is but too true, a circumstance that must be lamented by all who make common sense the guide of life. We can only term it refined barbarism, and can but regret the unhappy fate of so many fair victims. In place of ruddy health and vigour of body increasing with their years, every successive season shews how gradually these precious gifts are lost. The progress of consumption may, under any circumstances, be slow; it is, however, but too often sure, particularly when so encouraged. Its attack

may be so insidious as not to create suspicion, but let me ask, in the words of the poet—

> "With step as noiseless as the summer air,
> Who comes in beautiful decay? Her eyes
> Dissolving with a feverish glow of light;
> ——————————— and on
> Her cheek a rosy tint, as if the tip
> Of beauty's finger faintly press'd it there:
> Alas! Consumption is her name."

Persons engaged in sedentary occupations, as milliners and dress-makers, are all liable to pulmonary consumption, from want of exercise. In addition to confinement, the bent position, consequent on the nature of their employment, tends alike to predispose and determine a phthisical state.

Much new and valuable information has, within the last few years, been collected, in order to shew the influence of employments that subject tradesmen to the inhalation of irritating matter. M. Benoiston de Chateauneuf has furnished us with a valuable and elaborate paper, in which he gives a most singular account of the manufacturing of gun-flints. It will be found in the "Annales d'Hygiène Publique et de Médecine" for July, 1831. The following facts extracted from it give, however, the more interesting features

of this subject. He says, that the whole of France, and the greater part of the continent of Europe, is supplied with gun-flints from a single parish in France, that of Meusnes, containing a population of twelve hundred souls, of whom, about three hundred families are occupied with the flint manufacture. The French government alone consumes ten millions annually, and the exports amount to two hundred and eighty millions. This singular trade, however, has not been acquired without a terrible sacrifice of life and health on the part of the workmen. About the beginning of the last century, before flints were used for muskets, the mortality of the parish was one in 33¼; of the births, one-half survived till the eighteenth year; and the mean duration of life was 24¼ years. But after the establishment of the manufacture of flints, the mortality became one in 22¼; half of the births were cut off by the fifth year, and the mean term of life was reduced to 19⅛ years. The cause of this enormous increase in mortality, according to the author, was consumption, arising from the inhalation of flint-dust.

Dr. Johnstone, of Worcester, so far back as the

year 1796, was struck by the frequency of consumption among persons employed in pointing needles. In a paper, published by him with the view of directing attention to the subject, he observes, that they are constantly very soon affected with pulmonary consumption, and hardly ever attain the age of forty years.*

Dr. Knight, in his account of the grinders of Sheffield, gives a very clear and interesting account of the pernicious influence of their trade. He says, the grinders "altogether amount to about two thousand five hundred; of this number, one hundred and fifty, namely, eighty men and seventy boys, are fork-grinders: these grind dry, and die from twenty-eight to thirty-two years of age. The razor-grinders grind both wet and dry, and they die from forty to forty-five years of age. The table-knife-grinders work on wet stones, and they live to betwixt forty and fifty years of age."† The difference of mortality between those who grind wet and those who grind dry is very striking. No doubt the wet-grinding prevents, in some mea-

* In Memoirs of Medical Society of London, vol. v. p. 89. 1799.

† North of England Med. and Surg. Journal. vol. i. p. 86.

sure, the ascent of the metallic particles; but I have equally little doubt, that the humidity attending this sort of grinding proves very serviceable to the air passages and lungs. On comparing the diseases of the grinders with those of other mechanics, in Sheffield, he found, that two hundred and fifty-four grinders laboured under disease of the chest; while only fifty-six were similarly affected in the same number of workmen among other trades.

By contrasting the respective ages of the grinders with those of other workmen, he has furnished us with the following result:—

Age.	Grinders.	Other Workmen.
Above 30	124	140
—— 35	83	118
—— 40	40	92
—— 45	24	70
—— 50	10	56
—— 55	4	34
—— 60	1	19
	286	529

Dr. Alison, of Edinburgh, has furnished us with some most valuable Observations on the Pathology of Scrofulous Diseases, and Pulmonary Consump-

tion. The following extract from his paper is not without interest:—"Another fact," he observes, "which still more clearly demonstrates the effect of repeated irritation of the lungs in producing, even in constitutions not predisposed to it, that modification of phthisis which occurs in middle and advanced life, is the well known unusual frequency of the disease in those workmen who are much exposed to irritation of the lungs, particularly such as are in the constant habit of inhaling various fine powders into their lungs,—in coal-heavers, dressers of flax and feathers, needle-grinders, in the workmen in the mill-stone quarries of Waldshut, and in the stone masons in this country. I have witnessed many melancholy examples of the disease among the latter class, at the age of forty or more, and in well made men, of apparently vigorous constitutions, and the appearances on dissection have been what I have stated above; and I have reason to believe, that there is hardly an instance of a mason, regularly employed in hewing stones in Edinburgh, living free fromphthisical smptoms to the age of fifty."*

* Transactions of Med. Chir. Soc. of Edinburgh, p. 365, 1824.

Millers, and such as inhale particles less irritating than those to which grinders, stone-masons, and the like, are exposed, suffer considerably from pulmonary complaints, but consumption is not remarkably frequent among them.

I have had many opportunities of examining the lungs of stone-masons who have died from disease of the lungs, which, during life, very much resembled tubercular phthisis in symptoms. There was, however, a decided difference, obvious on making a *post-mortem* examination. The trachea and bronchial tubes were generally very highly vascular, the lungs ulcerated in some places, and their tissue much condensed in others. This disease was, therefore, totally different from tubercular phthisis, and no doubt that which carries off so many grinders, and so great a proportion of those engaged in the gun-flint manufactures is, in many instances, of this description. But pure tubercular phthisis is certainly more frequent among those exposed to the inhalation of irritating particles, than among other classes of society. The reason is obvious.

The inference to be drawn from the whole is,

that such employments, trades, or professions, as prevent their followers from taking moderate bodily exercise, and those which subject them to impure air, and particularly if charged with stimulating matter, all tend to induce pulmonary consumption.

The individual who is unfortunately liable, by hereditary organization, to consumption, and he who is already predisposed to this malady, may, on the contrary, by following an employment attended with moderate exercise and pure air, or air impregnated with animal matter, not unfrequently escape a disease that, under other circumstances, might have been inevitable. I am not aware that any class of men are so exempt from consumption as butchers. I, to the best of my recollection, have not seen a case of consumption among this trade for two years, and in London, it must be granted, its members are sufficiently numerous. The circumstance of their exemption from this malady has attracted the attention of many professional gentlemen, among whom I might name Dr. Beddoes, Dr. Withering, and Mr. Creaser. Dr. Beddoes made inquiries among the

butchers in Bristol, of whom there were then about five hundred, and he could scarcely find an instance of consumption having occurred among them.

Mr. Thackrah says, "Consumption is remarkably rare among the men employed in the slaughter-house. If we see a phthisical youth in the fraternity, we shall generally find that his parents, aware of an hereditary predisposition to consumption, brought him up to the business with the hope of averting this formidable malady."*

Tanners and tallow-chandlers are also peculiarly exempt from phthisis. Although it may be difficult to account for this fact, nevertheless it is indisputable.

PART VI.

INFLUENCE OF SEX ON PULMONARY PHTHISIS.

An opinion has very generally prevailed, that consumption is more prevalent among females than among males; an impression, I have no doubt, correct, although not to the extent supposed. I have very little doubt that the pro-

* Op. Cit., p. 9.

portion of females has been made to appear comparatively great, from the practice of calculating the actual number of deaths from this disease in each sex, and comparing them, without regard to the disproportion of the number of the male and female population. In Great Britain the female population is considerably greater than the male; and, consequently, although phthisis were equally fatal in both sexes, we ought to have a greater number of females sinking from this cause, than of males. The very usual method, therefore, of contrasting the gross numbers of each sex that sink from the malady, is no guide whatever in determining on which the mortality falls heaviest. As well might we contrast the vast number of consumptive deaths that take place in London during six months with those in Birmingham during a like period, without making any allowance for the immense difference of population; and draw an inference, that pulmonary phthisis is more prevalent in the former than the latter city, because the number of such deaths is greater; which would be grossly incorrect. To arrive at the truth, we must compare the number of deaths in each sex with the

respective population; or, in the absence of facts to enable us to do so, we may take the relative proportion of consumptive deaths in each sex, to the respective total number from whatever cause.

Observations made in public hospitals on this subject must be very partial, and can only apply to the poorer classes of society. And when we consider the influence of trades on this disease, we may readily presume that the inmates of charities have, generally speaking, been subjected to those causes which often exert so great a power on the lungs. Thus the observations furnished us by the reports of hospitals may be so affected by peculiar circumstances, incident to such a field of observation, as to render them of comparatively little value in solving the question in its full extent.

The following table, which I have constructed from the First Annual Report of the Registrar-General of Births, Deaths, and Marriages, shews the comparative mortality, as resulting from phthisis, between the sexes, throughout England and Wales, during a period of six months; as also the variations in a few different places.

The table refers to a period of six months; viz., from July 1st to December 31st, 1837:—

Place.	Sex.	Total Number of Deaths.	Deaths from Consumption.	Proportion of consumptive Deaths to the whole.
England and Wales -	Male	75,159	12,968	One-sixth.
	Female	73,542	14,786	One-fifth.
London -	Male	12,528	1,947	One-sixth.
	Female	12,431	1,930	One-sixth.
Devonshire	Male	2,411	389	One-sixth.
	Female	2,390	446	One-fifth.
Birmingham	Male	761	190	One-fourth.
	Female	698	164	One-fourth.

From the above table we perceive that, in making our observations on England and Wales as a whole, consumption was more fatal among females than males. The total number of female deaths was less by 1617 than that of males, but the number of female consumptive cases exceeded that among males by 1818.

In attempting to come to some conclusion on the subject under consideration, I am of opinion that

our calculations ought to be made on the fullest and most extensive field of observation. Pulmonary consumption is so much under the influence of particular trades, and these trades so universally followed in some districts, that calculations restricted to individual towns, or even counties, are certain to be more or less influenced by local circumstances. And were we to be regulated by calculations made in the individual towns and counties, the results would be so discordant as to leave us in a state of uncertainty. In London, for instance, the mortality seems equally divided between the sexes; in Devonshire, a greater proportion of females fall victims to this disease than males; and, again, in Birmingham, the proportions vary but little.

On the whole, I am disposed to think the general opinion that consumption is more prevalent among females than males is correct, at least as far as England and Wales is concerned.

Our French neighbours seem to entertain a similar opinion as regards their nation. M. Benoiston de Chateauneuf infers, from his statistical observations, that phthisis is, in France, much

more common among females than males. Out of 1554 phthisical deaths registered in four of the Parisian hospitals, (the Hotel Dieu, La Pitié, La Charité, and Cochin,) 745 were men, and 809 women; while, of the admissions, 26,055, were men, and 16,955 women; so that the proportional deaths from phthisis relatively to the admissions are 28.5 per thousand for men, but 47.5 per thousand for women.* His opinion is also confirmed by the researches of other medical men who have devoted attention to the subject. Their evidence is, however, in some instances, contradictory, a result to be expected from restricted inquiries.

We may conclude this subject by briefly mentioning the cause of the greater fatality from phthisis falling on the female sex. In my opinion it is easily accounted for. Have we not seen that want of muscular exercise, of free air, and of regular hours, and whatever tends to interrupt the free circulation of the blood through the lungs, tend to induce consumption? The answer must be—yes. And Dr. Rush has shewn, that the nearer we live to a state of nature, so much the less liable are

* Annales d'Hygiène Publique et de Médecine Légale, 1831.

we to this malady. Look, for instance, at the American Indians, among whom consumption is unknown; a circumstance easily accounted for by their strict adherence to the simple, unsophisticated habits of life suggested by nature. Let us now turn our observation to the delicate frames of those females who move in the higher circles of refined society, and what a melancholy and pitiable contrast will present itself! Here, instead of the rosy hue of blooming health, we too often meet the sickly pallor of countenance, the unerring forerunner and inseparable attendant of pulmonary phthisis—a pallor which is only relieved by the periodical accessions of a consuming hectic, which soon dries up the very springs of life. Nor will it be difficult to trace such sad effects to their real cause—viz., late hours, and want of natural rest, insufficient exercise in the open air, by the influence of which the functions of digestion and nutrition are impaired, and ultimately destroyed; to which may be added, tight lacing, by which the all-important function of respiration, and consequently the conversion of venous into arterial blood, are so materially interfered with. To render the case still

more distressing to the philanthropist, we invariably find that it is the most interesting, fascinating, amiable, and intelligent of the sex who so frequently fall victims to the ravages of consumption.

PART VII.

INFLUENCE OF AGE ON CONSUMPTION.

Pulmonary consumption is a disease that respects neither rank nor age. "It affects," as M. Bayle says, "all ages, from the most tender infancy to the most decrepit old age."* We may be born with this disease far advanced, and it may terminate a long and previously healthy life. I have attended several infants, one under four months, in phthisis; and, I believe, were it not that they swallow the expectoration, and that their cough is often supposed to be hooping cough, or the mere effects of cold, more cases of consumption would be recognised in that tender age. We have many records, shewing the frequency of tuberculous matter,

* Researches on Pulmonary Phthisis, by G. S. Bayle, M.D., translated by Dr. Barrow, p. 40. 1815.

or the seeds of consumption, in the system during early life. M. Guersent, an experienced physician, attached to the Hôpital des Enfans Malades, in Paris, a charity admitting no patient under the first or above the sixteenth year, gives it as his opinion, that tubercles existed in two-thirds, or even five-sixths of the bodies which he examined.* Many cases of phthisis have presented themselves in the very opposite extreme of life.

Nevertheless, there are some periods at which it seems more fatal than at others. Medical gentlemen have therefore endeavoured to detect the various ages at which it most frequently carries off its victims, and on this subject considerable information has been collected.

The following interesting table was drawn up by M. Bayle, to shew the different ages at which death occurred among a hundred phthisical patients who died in the Hospital of La Charité, at Paris :—

* Clinical Reports, Journ. Hebdom, tom. vii. p. 588.

Age.	Deaths.	Age.	Deaths.	Age.	Deaths.
15	1	33	1	50	1
17	1	34	2	51	3
18	2	35	3	52	3
19	3	36	3	53	1
20	3	37	1	54	2
21	2	38	3	55	2
22	3	40	5	56	1
23	5	41	1	57	1
25	2	42	6	60	2
26	2	43	2	61	1
27	4	44	2	62	2
28	1	45	2	67	1
29	1	46	1	68	1
30	3	47	3	69	1
31	3	48	2	70	2
32	2	49	1		—100

He then shews the result of the same table, divided by ten years, as follows :—

Age.	Dead.	Age.	Dead.
From 15 to 20	10	From 40 to 50	21
—— 20 to 30	23	—— 50 to 60	15
—— 30 to 40	23	—— 60 to 70	8
			—100

From this it appears that, out of one hundred deaths from consumption, thirty-three only were below the age of thirty, and sixty-seven above it,

of which last number forty-four were above the age of forty.

Dr. Alison, of Edinburgh, says, that "in the practice of the New Town Dispensary here, there have been fifty-five deaths from phthisis in the last two years. Of these, eight occurred before fifteen years of age, thirteen between fifteen and thirty, thirty-four after thirty, and of these last twenty-four after forty."*

Hippocrates observed that the age most liable to consumption is from eighteen to thirty-five; and I am inclined to think, both from my own observation, and from the experience of others, that his opinion is correct.

We have, however, sufficient evidence to convince us that age is no protection, and that at all times the exciting causes ought to be religiously avoided, and particularly where a predisposition to the disease exists.

* Op. cit., p. 368.

CHAPTER II.

PATHOLOGY OF CONSUMPTION.

"Felix qui potuit rerum cognoscere causas."—VIRGIL.

PATHOLOGY constitutes by far the most important branch of medical science, if we except anatomy. But a knowledge of the former is no less necessary to the medical practitioner who makes reason his guide in practice, than is a critical acquaintance with the structure of the human body. Pathology teaches us not only the morbid changes which take place in the various organs, but points out their causes and origin. It must therefore appear evident that the physician who neglects this branch of his profession, cannot trace cause and effect, and it must be equally apparent, that in the treatment of a case, he can only adopt such remedies and means as he has been taught to believe are useful.

As well might a man who has only learned the formation of a watch, but is utterly ignorant of the principle of its movement, endeavour to regulate it, as the physician who has not studied pathology, try to cure a disease by his own reasoning without an acquaintance with the nature of the morbid changes which the body may have undergone. The former adopts certain means to make it go slow or fast, merely because some person has said that such means will have the effect of producing the required change, but he does so, ignorant of the rationale on which such effect depends. In the same manner the physician, who has not studied pathology, employs certain measures to regulate the deranged functions of the body, because he has been told they will have the desired effect; but nevertheless, he is totally unacquainted with the morbid condition of the body demanding such measures.

The pathology of pulmonary consumption should not only shew the morbid changes which take place in the lungs of those unhappily the subjects of this malady, but also point out to us clearly and distinctly the origin and causes of this deviation from

health. It is therefore manifest that he who undertakes the responsibility of treating this disease, and who has for his object the restoration of the lungs to a healthy state, and the removal of the primary cause, which induced, and would again induce, a return of the malady, even after a cure of the local disease in the lungs, ought, in order to attain his object, be thoroughly acquainted with the pathology of pulmonary phthisis.

For as the success or inefficiency of our treatment depends solely and entirely on the correctness of the views entertained of the pathology of a disease, how useless, nay, how pernicious, must be that mode of treatment founded on wrong views of this subject. Not only may the remedies prove ineffectual in protecting and restoring health, but, from their being selected in ignorance, and contra-indicated by the true nature of the malady, the result may be most fatal. The disease, in place of being subdued, is urged on, from bad to worse, till death ultimately throws its curtain over the scene. Such, I fear, has been but too frequently the case with consumption. Hitherto this has

been not only the most common, but infinitely the most mortal of all diseases. How seldom have we heard of a confirmed case of pulmonary phthisis being radically cured? Who does not anticipate the very worst result in every instance where consumption has attacked the lungs? Who has not beheld the consumptive invalid linger on, from day to day, and from week to week, and, although under the immediate and anxious care of, perhaps, an experienced and able physician, nevertheless, gradually losing flesh and strength, till nothing but a shadow remains for the cold earth to claim?

It is reasonable to believe that there must be some cause for so universal a want of success attending the medical treatment of this malady. There has been ample field for observation, free scope for experience. Neither does the disease run its course so quickly, that medicines and remedies might not have time to act; nor is phthisis so difficult to detect, as that diagnosis does not give us timely warning. Everything connected with the malady has been most favourable for establishing a more successful mode of treatment.

Where, then, lies the great, the fundamental error, which has misled so many able physicians, not for a season, but for centuries? Exactly where we might anticipate — namely, in erroneous views, or, to say the least, in half views of the pathology of the disease. Pathology is to the physician what the compass is to the mariner, and as well might the latter try to steer his vessel to her destined port with a compass which points the wrong way, as the former try to discover a successful mode of treating consumption, while his views of its pathology are incorrect and mistaken. Here, then, lies the cause of the want of success. No doubt the great Laennec, whom I might not improperly term immortal, did much for science, by throwing new light on the pathological condition of the lungs in this disease. But consumption should not be considered as a local disease, merely confined to one organ. He who restricts his attention to the state of the organs of respiration, in this complaint, takes in but a small share of the field of consumption.

Having thus considered the vast importance of correct and complete views of the pathology of

pulmonary phthisis, I shall endeavour to point out what I believe to be the true nature of the malady. I do not pretend to be possessed of greater discernment, or sounder judgment, than others, by which I have been enabled to throw light on that which has so long been enveloped in darkness; but having devoted my particular attention to this malady for years past, and having made its pathology and treatment the object of my studies and reflection; having had innumerable opportunities of investigating, minutely and carefully, the various tissues and structures implicated in this disease, at Paris, under the celebrated Louis; having had, moreover, the advantage of the experience of my predecessors, in some instances pointing to truth, and in others guarding me against error, it surely is not unreasonable to hope that, from such a combination of favourable circumstances, some good may result.

That the new views of the pathology of consumption, presented in this work for the first time, as to its primary cause, are correct, I have no hesitation in asserting. My evidence lies in the success which has attended, and continues to attend, my prophylactic treatment. Had my views of the pathology

of the disease been wrong, the result of my treatment must have been unsuccessful, and vice versâ.

Having said thus much, I shall now endeavour to render the subject matter of this chapter as plain and intelligible as possible.

In order that the morbid changes and actions which form the groundwork of pulmonary consumption may be clearly understood by the non-professional reader, it is necessary, in the first place, that he comprehend the working of the system therein implicated, in the physiological or healthy state. In the absence of this information, it would be impossible to discriminate between what promotes health and induces disease, and the import of the following pages would be rendered obscure, if not incomprehensible. This, therefore, naturally claims our first consideration. After this, we shall be able to investigate the morbid conditions which lead to the absorption of the seeds of consumption, and the circumstances which cause their deposition in the lungs, as also their appearances and effects on these organs, and the system generally.

PART I.

NATURAL AND HEALTHY PROCESS OF NUTRITION.

It must be evident that the great and steady increase which takes place so gradually in the frame, from infancy to maturity, must be the result of a continual production of new animal matter taking place in the system. And it will be readily granted that this can only be manufactured, if I may be permitted to use a very familiar but appropriate term, by the machinery of which the body is so beautifully and marvellously composed, from material supplied to it by the animal and vegetable kingdoms. Such is the case, and nothing can excite more forcibly than this, our adoration of the all-wise, but incomprehensible Maker of man.

Not only the growth of the body, but also the supplies which are to compensate for the waste or expenditure constantly going on while life exists, derive their resources from the numerous and varied ingredients so regularly introduced into the stomach. This is the first machine or organ, to the action of which the food is entrusted, in order

that it may undergo the first stage of the process whereby it is ultimately converted into blood. The term Digestion has been applied to this function, which has been defined, "the process by which aliment is made to undergo a succession of changes, so as to adapt it for the purposes of nutrition."*

The food, when in the stomach, is there reduced to a soft mass, known to medical men by the name of chyme. Although our evidence of the means by which this change is effected may not be perfectly conclusive, still there can remain no doubt but that the coats of the stomach secrete a fluid having this power. The fluid to which I refer is termed the "gastric juice," and is the substance so well known to cheese-makers, by which they are enabled to coagulate the milk, in order to procure the curd, which for this purpose is obtained from the stomach of the calf.

It is the general opinion of our most accurate observers, that a chemical action takes place between the food and gastric juice. The result seems not only to be the solution or minute

* Bostock's Physiology.

division of the contents of the stomach, but in addition, new properties are acquired, whereby the food approaches one stage nearer to the state required, before it can become fit to support animal life. And all the various kinds of aliment require to undergo the same process by means of the gastric juice, after which, as already stated, it is known by the name of chyme.

The first stage of digestion being now completed, the chyme is transmitted from the stomach to the first portion of the intestine, termed the duodenum. But the inquisitive may desire to learn how it is propelled from one organ to another. The stomach and intestines are furnished with a muscular coat, which enables them to keep up a continual motion, very much resembling the action of a worm when crawling. This intestinal movement is, in consequence, denominated the vermicular motion of the intestines, and has the effect of carrying the food onwards, and is the means of transmitting it from one organ to another.

When the contents of the stomach enter the duodenum, they are there subjected to a new

action, the second process in assimilating the food. The first we have found to be performed in and by the stomach, the second takes place in the duodenum, but apparently with the assistance of other organs. I regret to state that we are in possession of but few facts demonstrative of the means whereby this second stage is effected. One is, however, undeniable—namely, that soon after the chyme has entered the duodenum, it begins to separate into two parts. One portion of this is a white opaque substance, bearing a great resemblance to cream, not only in its colour, but also in its physical properties. This newly-formed matter is termed chyle, and possesses the peculiar property of being convertible into blood and organizable matter, such as flesh and bone. How it becomes separated from the remaining mass, which is inorganizable, and constitutes the fæces, is a process of which we seem in perfect ignorance. The liver and pancreas—the latter of which is often known by the name of sweetbread—transmit their secretions to the intestines, at the place where this separation is effected, but they do not appear at all to contribute to this separation. However, when it is accomplished, the process of digestion is then completed.

The object of digestion—a process which we have found to be accomplished in two different organs, and to be divisible into two stages—is to prepare and separate the organizable from the inorganizable matter taken into the stomach, and to effect such changes in the former matter as shall render it susceptible of being converted into blood on being submitted to the influence of the atmospheric air in the lungs. This intricate process of digestion being now effected, we have, in the next place, to consider how and by what means the chyle, or, as it may be termed, organizable matter, is conveyed to the blood, and exposed to the atmospheric air.

Numerous small vessels, termed lacteals, arise on the inner coat of the alimentary canal, which ultimately unite on the body of the second or third lumbar vertebra, and form a tube about the size of a quill, known by the name of the thoracic duct. But as we trace the lacteals onward from their origin, towards their ultimate point of union, we find numerous round or ovoid bodies, termed mesenteric glands, which appear, as it were, to interrupt their course. The lacteals, entering these bodies, divide and subdivide into numerous small vessels, in which there are very minute

cells, and then emerging, frequently in greater numbers than they entered, run on to the thoracic duct. From the third lumbar vertebra the thoracic duct running up enters the chest, passing along the right side of the spine, and crossing obliquely from the right to the left side, opposite the fifth or sixth dorsal vertebra, it ascends in the neck as high as the sixth cervical vertebra. It then bends tortuously downwards and outwards, and joins a vein termed the left subclavian, just before its union with the internal jugular, shortly before they reach the heart.

The organizable matter, which we have traced throughout its preparation and separation from the food, the process of digestion, is absorbed by the mouths of the lacteals, which, as formerly observed, rise on the internal surface of the alimentary canal. These vessels possess the inherent sense of selecting the organizable from the inorganizable matter, or in other words, the nutritious fluid termed chyle, from that which contains no nourishment, and is ultimately discharged from the body. This sense is as peculiar to them as is vision to the eye, or hearing to the ear. In fact, these vessels possess as distinct a sense as that of seeing, hearing, touch,

taste, or smell. And when we consider that on them devolves the vital task of selecting the organizable from the inorganizable matter, of taking up and transmitting to the blood the seeds of life, are we not warranted in supposing that they are endowed with the most highly developed organization? Such is the fact. What can be more admirable, at the same time more incomprehensible, than this singular, this vital faculty, bestowed, by a peculiarity of organization, on the mouths of the lacteals, and engrossed in a space so minute as scarcely to be obvious to the human eye, even when aided by the microscope? On their organization is stamped the sacred impress of creative wisdom, so deeply as to arrest the attention of the most thoughtless, while it must elicit the admiration of all who reflect on the great first cause of such a structure.

The organizable matter prepared from the food, having once entered these vessels, passes through the mesenteric glands, which bodies have been supposed by some physiologists to purify it, as it were, by filtration. Others, again, suppose that they secrete a fluid which tends to dilute the organizable matter, but these opinions are merely

gratuitous, and, like many others, shew most plainly the infant state of medical science. Having passed through these glands, the organizable matter runs along the lacteals to the thoracic duct, which transmits it directly to the blood, with which it first becomes mixed in the neck, shortly before entering the heart.

But although the organizable matter is now combined with the blood, nevertheless it does not yet possess the properties of that vital fluid. The conversion of the former into the latter, of a milky looking fluid obtained from the food into human blood, is a process which may well excite feelings of adoration even in the most debased. The nutriment, on being mixed with the blood, flows on to the heart. On entering the right side of this propelling machine, it is by the power thereof forced on through the lungs, and back to the left half of the heart. But while passing through the pulmonary tissue, it is there exposed to the influence of the atmospheric air, and, along with the venous blood with which it was previously united, is converted into pure, red, florid arterial blood, fit for all the purposes of animal life!

It would appear from experiments made by the

most correct observers, that the following changes take place in the lungs, between these vital fluids and the atmospheric air we breathe for this purpose.* The blood absorbs or consumes more or less of the oxygen from the air inhaled, and in return discharges a quantity of carbonic acid, equal to, and in many cases exceeding, the quantity of oxygen received. This process effects an immediate change on the colour, and, beyond doubt, equally so on the other properties of the blood. That which was, prior to this exchange of gases, dark venous blood, incapable of sustaining life, instantly becomes red and florid, termed arterial. It is then fit for every purpose required in the economy, and so important is this state, that a stoppage of the supplies of air, but for a few minutes, destroys existence. "But although the fact be thus established, the manner in which this change is effected is much less easy to comprehend than the nature of the change."†

But, as formerly referred to, another effect of

* Atmospheric air is composed of oxygen, nitrogen, carbonic acid, and aqueous vapour. The first two substances are its essential constituents. It never varies in composition, and is the same in all places and at all seasons. It consists in bulk of 79 azote and 21 oxygen=100

† Bostock's Physiology.

respiration is to complete the process of assimilation—namely, that of converting the chyle or organizable matter into blood. Important as must be this process, still the mode by which it is effected remains one of the many mysteries in which the healing art is involved. It has been *supposed* that the removal of carbon from the blood, during its passage through the lungs, tends to bring it into that condition which fits it for the purpose of repairing the necessary waste of the body, and maintaining the various functions in their perfect state. One fact is, however, certain—namely, that this object is effected in the lungs, yet how, or by what means, has not hitherto been ascertained.

This process completed, the blood is returned to the left side of the heart, renewed in power, and charged with a fresh supply of nutriment. It is now capable of supporting life, and susceptible of conversion into bone, or any other tissue of which the body is so miraculously composed. The heart next propels it to all parts of the frame through the arteries, and where repair from the expenditure consequent on the functions of the body is re-

quired, there do the minute vessels prepare and deposit the necessary supplies. In one case they will manufacture bone; in a second, muscle; in a third, fat; in a fourth, hair; and, in a word, any constituent part of the body. This is, again, the result of peculiar and distinct species of organization, yet so delicate and so exquisitely minute, that man, with all his ingenuity, can as little comprehend the varied operations here taking place, as he can fathom the infinite wisdom of his Maker.

In this way the growth of the body takes place, and by this means all wastes are supplied. The blood,* after these processes are performed, loses its vital properties, and returns to the heart by the veins, having first received, from the thoracic duct in the neck, a fresh supply of organizable matter, all of which undergo a repetition of the process we have just seen so wonderfully effected in the lungs, and by which it is again qualified for the support of the body.

We have now seen how the system is supported

* The quantity of blood in the human body constitutes about one-fifth part of the whole weight. It is supposed that three-fourths of it are in the veins, and one-fourth in the arteries.

in a state of health. We have now learned what actions take place in the lungs, and their effects on the economy. We have traced the food from the mouth to the stomach, have seen the changes which prepare it for being converted into blood, and its ultimate application.

PART II.

MORBID CONDITION WHICH LEADS TO THE ABSORPTION OF THE SEEDS OF CONSUMPTION.

I have already applied the term, organizable matter, to the chyle or nutritious fluid prepared and separated from the food. And, as before observed, it is termed organizable, from its susceptibility of being converted into the tissues of which the organs are composed. But we have found that a great proportion of the food transmitted to the stomach does not undergo the change necessary to qualify it for this purpose. It is in consequence inorganizable, or, in other words, it is not convertible into animal matter. This depends on two circumstances; first, it has not all been fully acted on by the stomach and the other co-operating

organs. The consequence is, that a certain proportion of the ingesta, that would otherwise have been converted into organizable matter, remains inorganizable. Again, the whole of the remaining proportion, although acted on by these organs for an indefinite period of time, could never become susceptible of assimilation, or of being converted into organizable matter, as it does not contain the principles necessary for this purpose. Being, therefore, unfit for the support and repair of the animal body, it is accordingly rejected.

Sometimes, however, a portion of this matter is taken up by the lacteals and mixed with the blood, and circulated with that fluid, unchanged in its properties or composition. The atmospheric air in the lungs can consequently effect no change on it, and in whatever organ or part of the body it becomes deposited, there it remains as a foreign body.

Suppose, by way of illustration, that the lacteals were to absorb an ounce of gun-shot, and that the pellets were to become mixed and circulated with the blood. They could never be converted into muscle, or participate in the repair of any organ. And even when deposited by the blood-vessels,

either singly or collectively, in any organ, there they would remain, irritating and disturbing the surrounding parts. Such is exactly the case with the grains of inorganizable matter. While in circulation with the general mass of blood, they seem to produce no local mischief, often, however, rendering the whole system irritable. But when they are deposited in any organ, they there produce effects exactly similar to what would result from the deposition of gun-shot. It is this inorganizable matter, absorbed from the alimentary canal, and circulated with the blood, that constitutes the seeds of pulmonary consumption. It is the irritation produced by these seeds when deposited in the lungs, that leads to all the melancholy consequences attendant on this dreadful malady.

Pulmonary consumption, or tubercular phthisis, cannot take place till these seeds are absorbed, and circulate with the blood.

In medicine, these seeds are generally known by the name of tubercular matter, and when deposited in the lungs in separate masses, they are termed *tubercles*, and the resulting disease is denominated consumption of the lungs.

It may, however, be here observed, that when tubercular or inorganizable matter becomes deposited in any of the lymphatic glands, or in the joints, the disease is termed scrofula. If, on the other hand, it is arrested in its passage through the mesenteric glands, already referred to, then the name of tabes mesenterica is employed to distinguish it. It must, therefore, appear obvious, that these three diseases are all radically one and the same, depending entirely on the presence of inorganizable matter, and differing only in locality. Their results are, nevertheless, as may be anticipated, as widely different as are the structure, functions, and importance, of the organs implicated. The glands that are generally the seat of scrofula, are not indispensable to life, and, therefore, when inorganizable matter becomes deposited in them, although suppuration follow, life is not necessarily compromised. The same may be said of the mesenteric glands implicated in tabes mesenterica. But the lungs being organs of so delicate and spongy a structure, and so indispensable to life, that, with their first action, it may be said to commence, and to terminate when they cease to act;

moreover so intimately connected with the due performance of every other function, as, when diseased, to elicit the universal sympathy of all the organs, it is not to be wondered at, that in them inorganizable matter should produce effects widely different from what it does in other parts.

In regard to the nature and properties of tuberculous matter, Dr. Carswell offers the following observations: —"The most important fact connected with the chemical composition of tuberculous matter is, that, either from the nature of its constituent parts, the mode in which they are combined, or the conditions in which they are placed, they are not susceptible of organization, and consequently give rise to a morbid compound, capable, as I have already said, of undergoing no change that is not induced in it by the influence of external agents."* In itself it possesses no vital power whatever, and cannot be directly acted on, when in the lungs, by any medicine or agency yet discovered.

But it may very reasonably be asked, what evidence or proof can be adduced, to shew that the

* Pathological Anatomy, by Robert Carswell, M.D., 1838.

inorganizable matter does come from the alimentary canal by the lacteals, and that it is afterwards mixed with the blood. It must be allowed that it is impossible to open the body of a living animal, and give ocular proof that such is the case. Another method must, therefore, necessarily be followed, but one almost equally conclusive. In the first place, every one will allow that a great portion of the contents of the alimentary canal consists of inorganizable matter. This is indisputable. Secondly, the lacteals, which in the healthy state only take up chyle, may, when in a morbid condition, also absorb inorganizable matter. Numberless experiments have been instituted on the subject of absorption, and many with the view of detecting whether or not the lacteals admit any substance except chyle. Lister and Musgrave shewed that the lacteals do absorb inorganizable matter ; and Haller, Hunter, and Cruickshank, have all given similar evidence. We cannot therefore deny, that they, when in a morbid state, may absorb a portion of that inorganizable matter, and, in fact, the experiments instituted by the above-named scientific authorities

prove that they do. Dr. Ayre tells us, plainly and distinctly, that "diseased mesenteric glands occur in children from the acrid condition of the duodenal contents." Now the disease found in the mesenteric glands of children is neither more nor less than a collection of inorganizable matter, which we may fairly presume, from Dr. Ayre's statement, came from the duodenum or alimentary canal. We therefore see that inorganizable matter may be absorbed by the lacteals, and I can have no difficulty whatever in shewing its frequent existence in these vessels, with, I think, demonstrative proof that it came from the prima via or alimentary canal. Dr. Carswell, in his note explanatory of figure i., plate 3, representing tubercular disease, shews "the lacteals dilated, and filled with tuberculous matter, passing from the intestine into, and out of, the mesenteric glands, many of which are enlarged. All of them contain a greater or less quantity of tuberculous matter; one of them is completely filled with it. The lacteals are represented, arising from the ulcerated follicular gland. One of the branches was injected with mercury, the progress of which was soon arrested by the

tubercular matter accumulating in front of the metal." The preceding are Dr. Carswell's own words. They prove a great quantity of inorganizable matter in the lacteals close to the intestine, and in such quantity, and in such a locality, that it is directly contrary to physiology to ascribe any other source to it than the intestine. It is not a little singular that the lacteals so filled with tubercular matter are described as "arising from the ulcerated follicular gland," a circumstance shewing that they were in a morbid condition, as I have represented them to be, when indiscriminate absorption is going on.

But the frequency of inorganizable matter in the lacteals and mesenteric glands, as compared with other parts, evidently points them out as its first channel, and through which it reaches the blood. Meckel, who is a very high authority in questions of pathological anatomy, tells us, that the mesenteric glands are the parts most subject to tubercular degeneration, more so even than those of the neck, groin, or axilla.

On the whole, it must be allowed that it may come from the alimentary canal by the lacteals, and

that it does so is rendered very manifest, by the experiments already referred to. Moreover, there is no other way of accounting for its origin, and here is a plain, simple solution of the mystery, supported by physiology, anatomy, and every-day observation.

And as the blood receives its constituent parts from the lacteals, if we can, in the next place, find tubercular matter in that vital fluid, I think there can be no additional proof required of its original source. That inorganizable or tubercular matter does become mixed with the blood, cannot now be denied. Lest, however, it might be supposed that it is my anxiety to found a theory rather than to confirm a truth, I shall once more have recourse to the words of other writers, but which I have confirmed by my own experiments and observations.

Dr. Williams, for instance, says, that tuberculous matter is "sometimes found in the blood itself, and also in fibrinous concretions within the vessels." He, however, draws a most unwarrantable inference from this very fact; for he observes, that "this circumstance tends to shew that the fibrinous portions of the blood are liable to be converted into

tubercle."* Does he say how? No. But were the question put to him, could he answer it? I can say, No; an assertion, which, I venture to affirm, he cannot contradict. Here, then, is a glaring instance of assumption, without a shadow of argument to defend it. Why should not medical men throw all such baseless notions aside, and be guided by anatomy, physiology, and observation? Let me not be supposed, by this, to throw any reflection on Dr. Williams; for although I never beheld the gentleman in my life, still I respect him, as an intelligent and talented physician, and in this instance he only draws an inference without any grounds for so doing—a system unfortunately too generally adopted by medical practitioners, but one which I hope soon to see banished. Here surgery triumphs over physic, and that justly, because deservedly. Dr. Carswell, in his third plate illustrative of tubercular disease, gives a section of the spleen, in order to shew the tuberculous matter in the blood, as contained in the cells of this organ.

* Pathology and Diagnosis of Diseases of the Chest, by C. J. B. Williams, M.D., p. 132.

He tells us, that the tubercular matter separates "from the serum, fibrin, and colouring matter, and is distinguished from them by its peculiar physical character."

But the existence of tubercular matter in the blood of consumptive and scrofulous invalids has been, no doubt, witnessed by so many observing physicians, that I consider it useless to adduce further proof.*

Having, therefore, now proved its existence in the blood, we have confirmatory evidence that it originally came from the alimentary canal by the lacteals.

Let me not, however, be supposed to deny, that foreign matter that was never absorbed by the lacteals may be generated in the system, even from the most healthy blood. The secreting vessels possess the power, when in a morbid condition, of manufacturing inorganizable matter from the very purest blood. We, for instance, see this in various tumours. We also see it in the chalky

* For some excellent observations on this subject, the author begs leave to refer the reader to a paper by Dr. Thomas Hodgson Watts, in the Dublin Journal of Medical Science, vol. xx. p. 42, and vol. xxi. p. 1.

matter occasionally formed in the placenta, &c. But tubercular matter is not the result of a morbid secretion in the capillary vessels or glands, for we have the best of evidence—ocular demonstration—that it becomes mixed with the blood, and therefore we cannot argue that it is afterwards formed or generated from that fluid by secretion, as a mere separation is all that is required.

The most contradictory opinions have hitherto been entertained, as to how inorganizable matter is originally generated. Every possible view of the subject has been taken, if we except that which anatomy and physiology point out to us as most natural. But this seems to have been entirely neglected, or looked upon as too simple a path to lead to the truth, and therefore the mind has been employed to devise complex and intricate theories, none of which have stood the test either of observation or discussion. It may appear presumptuous to assert, that hitherto no rational opinion had been entertained on the subject, but such is, to the best of my judgment, the case.

A very favourite way of accounting for the formation of tuberculous matter has been by

ascribing it to inflammation, but, as Laennec observes, M. Bayle has completely proved that tubercles cannot be regarded, either as a termination, or consequence of inflammation. It is, says Laennec, satisfactorily proved by a multitude of facts, that the growth of tubercles in the lungs most commonly takes place without any previous inflammation, and that, when inflammation is found contemporaneous with them, it is generally posterior in its origin. The real cause, like that of all other diseases (he states), is probably beyond our reach.

Broussais says, tubercles are the result of a caseous secretion from inflamed lymphatics. Here is another instance of an assertion, without one shadow of evidence to support it. As already shewn, inflammation is not at all necessary for the formation of tubercles. Dr. Carswell observes that, " it is well known to every practical pathologist, whose mind is not biassed by preconceived theory, that inflammation, whatever may have been its degree, extent, or duration—whatever may have been the tissue or organ affected with it, is not necessarily followed by the formation of tuber-

culous matter, or any other product of a similar kind, inasmuch as in such cases we often meet with no trace of this particular product in the affected organ after death; and, on the contrary, the formation of tuberculous matter is found to take place in organs, the functions of which were never observed to have been deranged, and in which, after death, none of those lesions could be detected which are known to follow the presence of inflammation. Under such circumstances, it would be absurd to ascribe the origin of tuberculous matter to inflammation."* Dr. Thomas Reid† thinks that tubercles result from an obstruction of the exhalant vessels, caused by the viscidity of their contents.

Although Dr. Reid was a physician who thought and reasoned for himself, nevertheless he has no proof to adduce in support of this theory. A statement is easily made, but, in medicine, we ought to hold all groundless which have not the support of evidence, either direct or indirect. Professor Richter‡ says, that mucus in the lungs

* Cyclopædia of Medicine, vol. iv. p. 267.

† Essay on the Nature and Cure of Phthisis Pulmonalis.

‡ A. G. Richter's Medical and Surgical Observations, from the German, 1793; and Edinburgh, 1794.

may be a symptom of the existence of tubercles, or the cause of this morbid product; and Dr. Rush says, tubercles are nothing more than a collection of inorganic mucus in the lungs.

If we consider all, or even a few, of the arguments by which these theories may be opposed, their weakness and absurdity will be at once recognised. Observation alone will at once overturn each and all of them. On the contrary, the view I have ventured to express, to say the very least of it, may be correct, as it is founded on observation, anatomy, and physiology. Moreover, as we proceed in our inquiries, many facts may be adduced, on the highest authority, which will render the correctness of my observations very obvious. The inquiry into the morbid condition of the mouths of the lacteals, which leads to the absorption of tubercular or inorganizable matter, in consequence of which it ultimately becomes mixed with the blood, must be a subject of the deepest interest to the pathologist, and of the most vital importance to the practitioner. We have seen that the villi, or absorbing extremities of the lacteals, possess an inherent sense, whereby they are enabled to discriminate

between organizable and inorganizable matter. By this faculty, we find them absorbing the former and rejecting the latter—selecting healthy nutriment, and refusing the unhealthy matter. As before stated, this sense is as peculiar to them as is the sense of vision to the eye, or of hearing to the ear. The organs of sense are all endowed with their incomprehensible powers by a peculiarity of organization proper to them.

But in some families, we find the powers of vision much weaker than in the average of mankind, while it is not uncommon to meet with instances, where deafness has been hereditary in families for generations. This is consequent on some hereditary peculiarity in the eye and ear. This being the case, we may, I think, reasonably infer, that the mouths of the lacteals may, in common with other organs, occasionally possess some hereditary peculiarity of development. I consider this fact incontrovertible, and consequently that they, like the eye and ear, when improperly developed, do not possess in a perfect degree that faculty or sense peculiar to them. In the eye, it leads to imperfect vision; in the ear, to partial deafness; and in the

lacteals, to the partial loss of that sense whereby these vessels are enabled, in their healthy state, to discern between organizable and inorganizable matter.

There is no medical man who has observed for himself, who will deny that an hereditary peculiarity of organization does frequently exist, which induces tubercular disease. Dr. Cumin says, " The foundation of the scrofulous habit is frequently laid during the fœtal state, by the transmission of that peculiar organization of the frame from parents who themselves possess it. Nothing, indeed," continues he, " can be better established, as the result of general observation, than the hereditary nature of scrofula." Sir James Clark's observations also tend to confirm this, as the following extract is calculated to shew. He says, " that pulmonary consumption is an hereditary disease,—or, in other words, that the tuberculous constitution being transmitted from parent to child, is a fact not to be controverted; indeed, I regard it as one of the best established points in the etiology of the disease. A parent labouring under tuberculous cachexia entails on his offspring a disposition to the

same affection, proportioned in general to the degree of disease under which he labours."* Although he does not, like Dr. Cumin, expressly ascribe this to peculiarity of organization, still there is no other way of rationally accounting for it.

Where, then, or in what organ or part of the body, does this hereditary peculiarity of organization exist? I should say in the mouths of the lacteals, for it explains, without any difficulty, all future mysteries.

What, then, is their peculiar hereditary organization that induces the tubercular cachexia, and which ultimately leads to consumption in so great a proportion of cases? This, I consider, may depend on two circumstances. No organ can perform its office without the influence of nerves—therefore the lacteals must be dependent on their nerves for the due execution of their office; and as the nerves of the eye, ear, or any other organ, may be hereditarily malformed, the like may occur in those of the lacteals. Although we cannot always, in cases of partial deafness, when it results from some imperfections in the auditory nerves, detect

* Op. cit., p. 220.

the cause by investigating the structure of those nerves, in consequence of their exquisite delicacy, still we must grant that, in many instances, some organic peculiarity is the cause of the deficient sense. We cannot but admit that such may be the case with the nerves of the villi. But again: in the eye and ear the respective nerves are very often perfectly developed, and capable of performing their functions, yet, from some morbid condition of the surrounding parts, they cannot act. The optic nerve is in general perfectly sound in cataract, but, from the opacity of the crystaline lens, vision is nevertheless obstructed. The ear is often similarly circumstanced. Thickening of the tissue in which a nerve is deposited will render its action deficient, and I have no doubt but this is sometimes a cause of the deficiency of power in the nerves of the villi. This condition would not, therefore, depend on any diseased state of the nerves, but on the peculiar organization of the surrounding parts, whereby the nerves cannot exercise their function to the required extent.

Similar circumstances would, as respects the lacteals, by depriving their nerves of due power, also

disqualify them from discriminating between organizable and inorganizable matter, and thus predispose the individual so circumstanced to pulmonary consumption. In endeavouring to prevent the disease, it is to the original cause that we must direct our attention with any reasonable prospect of success, and from the success that has attended my practice based on this principle, I entertain no doubt of its accuracy. As this subject naturally comes under the head of *prevention*, I shall not dwell on it at present.

But consumption of the lungs is not invariably an hereditary disease; indeed, it is very frequently acquired, being contracted either by imprudence on the part of the sufferer, or, what is not uncommonly the case, the consequence of unavoidable circumstances. The lacteals may originally be most perfect in their development, and most efficient in their action—free from hereditary disease, yet, like other parts, ultimately become the seat of a morbid affection. Most persons have met with instances, where the organs of vision and hearing had originally been most perfectly developed, exempt from hereditary imperfection, and where they performed

their respective offices in the most perfect manner, yet ultimately, from some obvious and apparent cause, lost their powers. Vision has frequently been destroyed by long exposure of the eye to too powerful or unnatural stimuli, and hearing in like manner. Indeed there are many circumstances which, when not guarded against, will destroy these invaluable senses. And the mouths of the lacteals are equally subject to the loss of their discerning faculty, by exposure to the influence of unnatural agents; and when so exposed, the result will be precisely similar to what took place from hereditary disease—namely, the absorption of inorganizable matter. The changes that take place in their structure may be exactly the same as what we found as an hereditary development, although, in this instance, other circumstances may also lead to the absorption of the seeds of consumption.

Whatever will destroy the sense of discernment in the lacteals, will lead to the absorption of inorganizable matter. The causes of this may be divided into direct and indirect. The direct causes of this morbid action are, with one solitary exception, the continued or repeated influence of matter coming in

contact with the villi, which is unnatural to them. These are,—

Improper diet,

Injudicious use of medicine,

Inordinate indulgence in spirituous liquors; and,

Excessive fasting.

The indirect causes of the absorption of inorganizable matter are, whatever circumstances may impair the process of digestion. These are so familiar as scarcely to require notice; accordingly, I shall only advert, by way of illustration, to the extremes of exercise—viz.

Deficient exercise,

Excessive labour.

We may, therefore, consider how they act on the lacteals, in destroying their peculiar power of discernment. And, first, we shall review those which act directly on these vessels.

Improper Diet.—By improper diet is here implied, food which does not contain a sufficiency of nutriment, as also that which is too rich, and apt to pass from the stomach undigested. To these may be added, such food as differs very much from what had previously been used, and which has

been suddenly adopted; or, in other words, sudden and extreme change of diet. We have already seen that the organs of digestion, when free from organic disease and functional derangement, possess the power of converting natural aliments into chyme, and of separating the nutritious matter from the general mass. The process by which this object is effected has also been already explained. But, however ready the digestive organs may be to operate on matter adapted to the support of the animal economy, they cannot, but in a limited degree, alter the inherent properties of matter, nor extract nutriment from that which does not contain it. When imposed on by being required to do so, the consequence is, that such food passes through the stomach without undergoing the natural changes; thus it will not be fully converted into chyme, and little or no organizable matter will be separated from the general mass. In this state, the inorganizable matter comes in direct contact with the mouths of the lacteals. These vessels naturally exert their power to supply the system with nutriment from this source; but acting on unnatural ingredients, from which little or no chyle

has been separated, they are over-worked in their attempts, and foiled in their effort. The result will be, that these vessels, by over-exerting their powers on unnatural objects, lose their discerning faculty, and, in my opinion, eventually their absorbing power in a great degree. And it may readily be presumed, that by frequently coming in such direct contact with matter foreign to their nature, they will be irritated, and ultimately become the seat of inflammation. They can no longer discriminate between what promotes health, and induces disease, and the consequence is, that they absorb inorganizable matter.

But proper and nutritious food, as also that which is too stimulating, may be used, and produce similar effects, unless regulated in quantity, in the mode of its preparation, &c. I may here be permitted to avail myself of the confirmatory evidence of Sir James Clark. He says that even proper food, when taken in excess, is "a frequent cause of scrofula. Again: the aliment may be too rich; and if taken in excess, and indulged in for a length of time, the organs of digestion become deranged, and allow it to pass along without undergoing the

requisite changes. Its effects on the lacteals may, then, be exactly similar, and equally deleterious as would be those of matter which contained no nutriment, and was but little susceptible of change by the digestive organs. But what consequences do we see result from the want of correct views of pathology on this subject. The practitioner, ignorant of the real source of the evil, and not unfrequently entertaining erroneous notions of the cause, aggravates the very evil he wishes to remedy. I am also supported in this assertion by Sir James Clark, who says, that the effects of food of too exciting a quality, when taken in excess, in producing tuberculous disease, is "not generally understood, even by medical men." * Then he continues to remark, that "the ultimate effect is often tuberculous disease, which is generally attributed to imperfect nourishment; and on this erroneous view, steel and other tonics and stimulants are often prescribed, by which the evil is increased." † Do not these remarks go far to prove that scrofula, and consequently consumption, owe their very birth to the contents of the alimentary canal? I do not

* Op. cit., p. 230. † Op. cit., p. 231.

think that any thing can be more fairly claimed, as a just and well-warranted inference up to this part of our inquiries, than that the seeds of consumption come from the alimentary canal, and that, from ignorance of this fact, injurious treatment has been generally adopted.

Again : sudden changes of diet are peculiarly injurious, and tend to produce similar effects. The intelligent Dr. Paris says—" It would appear that, although man may subsist upon almost every variety of food, he cannot bear with impunity a sudden transition from one species to another." The stomach has not the faculty of altering its functions so readily as to accommodate its actions to such sudden and varied changes of diet, and, under these circumstances, the food is allowed to pass on unaltered in its constitution, and, consequently, injurious to the lacteals.

Abuse of Medicines.—The injudicious use of medicines will be found, not only a direct, but a most frequent and powerful cause of inorganizable absorption. I have no hesitation in saying, that could a medical man convince the public of the undoubted fact, that medicine is, at this day, and

has been for many years, taken in too great a quantity, and to excess, thereby producing more diseases than ever it will relieve,—such a man would confer a much greater benefit on the human race than any member of the profession ever has done. Medicines, when not absolutely requisite, either for the prevention or cure of disease, always produce some morbid condition of the system. In the alimentary canal, they come in direct contact with the mouths of the lacteals, and acting on them, frequently destroy the sensibility of these delicate organs beyond recovery. Their injurious consequences will vary, in a ratio with the nature and strength of the medicines consumed, the quantity taken, &c. One result is, however, always the same, except in degree—namely, the partial or complete loss of taste, or discernment in the mouths of the lacteals, and a consequent absorption of inorganizable matter, which, becoming mixed with the blood, circulates throughout the system, until it is either again discharged, or deposited in the lungs or some other organ. Sir James Clark remarks of calomel, that "there are few remedies more efficient," but he says that "the injudicious manner

in which children are dosed with it, and drenched with black draughts, is the destruction of many. Against this pernicious system of treatment," continues he, "I would enter my strongest protest."

There is, perhaps, no habit more universal than opium-eating in some districts of England. Although opium is not taken, by those who indulge in it, as a medicine, but as a stimulant, nevertheless, it is one which destroys the sense of the lacteals very readily. As it is one of the most powerful narcotics, we might naturally expect, if the views of the pathology of phthisis which I have laid down are correct, that opium-eaters would ultimately fall victims to pulmonary phthisis, the consequence of the direct narcotic effects of this drug on the nerves of the villi, whereby the lacteals would lose their sense of discernment, and consequently absorb inorganizable matter. And such is the case. In Lincolnshire, opium-eating is a very general habit among the lower orders, and where it is confirmed and indulged in for a length of time, I am informed tubercular disease is generally found to exist. Dr. Christison, of Edinburgh, has, with his usual ability, investigated so far the effects of

opium-eating on health and disease; but, as he justly remarks, it is singular how very little is known by the medical profession of the effects of this habit. In the first volume of the *Lancet* for 1831-32, p. 710, Mr. Mart observes, that "opium-eaters are generally affected with, or predisposed to, pulmonary complaints." Out of ten cases brought forward by Dr. Christison, there is only one of death where the cause of the mortality is known, and there the opium-eater "died, aged forty-three, of consumption." And in the cases given by Mr. Mart, pulmonary consumption was the cause of death in every instance. We have, therefore, the coinciding testimony of those who have attended to the effects of opium, proving that it does lead to the absorption of inorganizable matter. I therefore consider this a powerful argument in favour of the new views of tubercular disease which have been offered by me in this work.

The injudicious use of medicine, if persevered in, from whatever motive, also destroys the functions of the stomach, and in this way acts as an indirect, but certain, cause of inorganizable absorption. There are but few families, indeed, where

some member of it does not illustrate the baneful effects of over-dosing: but this, like inebriety, seems to be a passion which, although indulged in from different motives, is seldom subdued till the result is past remedy.

Abuse of Spirits. — Inordinate indulgence in spirituous liquors is a passion, that not unfrequently leads to the absorption of inorganizable matter. A very high authority, whom I have often quoted, says, that "among the causes of tuberculous cachexia, a free indulgence in ardent spirits holds an important place. There is," says he, "good reason to believe, that the abuse of spirituous liquors among the lower classes in this country is productive of consumption, and other tuberculous diseases, to an extent far beyond what is usually imagined." Spirituous liquors, although they no doubt act directly on the mouths of the lacteals, by bathing them, as it were, in this narcotic, and consequently destroying their sensibility, moreover impair the functions of the stomach and liver. These organs, the integrity of whose functions are so important to the healthy condition of the body, then become incapable of converting the most natural and

healthful of food into chyme, so that it passes along the alimentary canal unchanged in its properties, consequently destroying the sensibility peculiar to the mouths of these lacteals. Indulgence in spirituous liquors, therefore, very obviously leads to the absorption of the seeds of consumption in two ways, so that the drunkard has a double chance of falling a victim to one of the most dreadful scourges that ever afflicted humanity. Dr. Wilson Philip truly remarks, that "alcohol, in every shape, is unnecessary to those who are in health, and have never been accustomed to the use of it; and that, had no beverage but water ever been known, however we might feel the want of a stimulus, some of the most fatal diseases we are subject to would have been less frequent."

And the learned Dr. Willan, whose field of observation was very extensive, as physician to a large dispensary in this capital, confirms the general bad effects of this habit. He says, "on comparing my own observations with the bills of mortality, I am convinced that considerably more than one-eighth of all the deaths which take place in persons above twenty years old, happen prema-

turely, through excess in drinking ardent spirits. The stomach and bowels suffer first," says he, "from the use of spirits; and then their baneful influence is afterwards extended gradually to every part of the body, producing a variety of morbid phenomena." Well might Dr. Paris say—"happy is the man who considers water the best drink, and salt the best sauce." But as I am convinced that neither argument nor example will overcome this, the most baneful of all habits, there can arise no good from further remarks on the subject.

Excessive Fasting.—In considering the causes of inorganizable absorption, excessive fasting is well worthy of our notice. When the system demands a fresh supply of organizable matter, and this demand is not complied with, the mouths of the lacteals become excited, and on food being transmitted to the alimentary canal, they not only absorb inorganizable matter, but also inorganizable particles. They, in fact, do what a starved man would—namely, consume whatever comes within their reach, whether healthful or the reverse. But, fortunately, we have but few opportunities of observing the effects of an imperfect supply of food.

And when such painful circumstances do come under our notice, we find that they have been attended by so many other aggravating evils, such as cold, fatigue, &c., as to prevent our deciding what influence deficient nourishment alone may have exercised. But that inorganizable absorption is one result, and that to a great extent, there can be but one opinion. Dr. Cumin also adds his testimony to the frequency of tubercular matter being a consequence of imperfect nourishment.

Having now illustrated how certain agents, which act directly on the mouths of the lacteals, destroy the natural sense peculiar to these vessels, and induce in them a morbid indifference, we are consequently furnished with the causes which are most active in promoting the absorption of the seeds of consumption. We have, in the second place, to investigate those which act indirectly in producing such an effect. It may therefore be observed, that whatever has the power of destroying the natural action of the stomach, and preventing the full digestion of the food, will, if long continued or often repeated, have a tendency to the same result. It has already been stated, that there is no more

powerful cause of the destruction of the inherent faculty of discriminating between organizable and inorganizable matter,—a faculty peculiar to the lacteals,—than is the direct contact of these vessels with undigested food. Dyspepsia must, consequently, be a fertile source of such a morbid contiguity, and it must appear altogether unnecessary to enter into a detail of all the circumstances which would induce indigestion. They are so numerous, as well as so familiar, that I shall consequently, by way of illustration, content myself with considering merely the two following:—

Deficient Exercise.—This is a very frequent and powerful cause of the absorption of inorganizable matter. There is nothing tends more forcibly to weaken the action of the system, and to impair the organs of digestion. Sir James Clark says, "If a due supply of proper food and pure air are necessary to nutrition, bodily exercise is scarcely less so." Dr. Cumin truly remarks, that "the mischievous effects of the want of air, and sun-light, and healthful exercise, may be seen among the rich as well as the poor, though not to the same extent. The confinement, mental fatigue,

and anxiety, to which female children, in particular, are so unremittingly subjected during their education, prove fertile sources of scrofula in boarding-schools ; and even in the families of the higher classes, bodily health is too often sacrificed to the idol of accomplishment, and the intellectual powers, perhaps originally of excellent quality, are forced into a state of extreme culture and morbid precocity, destructive of all genuine soundness and vigour." The inquiring Louis observes, that " of all the causes which seem directly active in the production of phthisis, this (a sedentary life) appears the most general and influential. In our manufactories," says he, " there is no doubt that a far greater number of consumptive patients is produced by the want of exercise, and a confined posture of the body, than by those special, and in general local, influences to which the disease has been so often erroneously attributed." *

Excessive Labour.—Most persons have experienced the effects of over-exertion. One very general and almost universal consequence is, the total loss of appetite for food. And when bodily fatigue

* Louis' Pathological Researches on Phthisis, by Cowan, p. 343.

is kept up for weeks and months, the stomach becomes so affected, that food, when subjected to its influence, passes through this organ but little altered in its properties, and consequently proves destructive to the sense peculiar to the villi. And although in this case, as under the conditions already inquired into, inorganizable matter may not manifest its existence in the system, by becoming deposited in any particular organ, nevertheless, excessive labour is as sure a cause of the absorption of inorganizable matter as almost any other.

The intimate connexion which subsists between dyspepsia and pulmonary consumption has not failed to attract very general notice. I am not aware, however, that they have been ever considered in the relation of cause and effect. Dr. Todd has particularly adverted to the union between tubercular complaints and dyspepsia, and he has even given the name of Strumous Dyspepsia to that which I believe induces the disease. He says that it "presents a more characteristic feature of this habit of body (tubercular), than any physiognomical portrait which has yet been drawn of it. Upon whatever temperament the disordered

habit we call scrofula may engraft itself, we venture to say that this form of dyspepsia will also there be found; and therefore, being constantly present with it, preceding and accompanying the various symptoms which issue from it, it would be contrary to all reason to refuse to it an important share in the development of this disordered habit, and in the production of the local affections which have hitherto too much engrossed the attention, to the exclusion of a proper consideration of the constitutional disease."*

This quotation I consider invaluable in the support of the pathological views offered in this treatise. It shews how intimately the state of the alimentary canal is connected with the absorption of inorganizable matter, and that this state *precedes* the various symptoms of tubercular disease. In my opinion, there can be nothing clearer than the source from which the seeds of consumption flow, and if we can stop the morbid influx, we shall accomplish more in subduing the mortality from this awful malady than has yet been done.

An opinion has already been offered, as to the

* Cyclopædia of Medicine, Art. INDIGESTION; vol. ii. p. 654.

probable organic changes which may take place in the villi of those hereditarily predisposed to tubercular disease. These, as has been stated, may be confined to the nerves, or may be only attributable to a thickening of the tissue in which the nerves are developed. Where the disease is acquired, I am disposed to believe that undigested food, or other matter unnatural to the lacteals, produce, in some instances, irritation and inflammation in the latter. The natural consequence of this would be thickening of the villi, by which the sensibility of their nerves would be diminished, and absorption of inorganizable matter the consequence.

In other cases, again, where narcotic substances have been long indulged in, they may act directly in destroying the sensibility, and, consequently, the discerning power of the lacteals, as, I have little doubt, happens with opium-eaters. Their liability to pulmonary consumption is ascribable to some cause; and if we admit this as correct, we can explain it on reasonable grounds.

From the foregoing views, we would therefore attribute the production of phthisis, in many cases, to functional derangement of the stomach, and

other organs connected with digestion. This, as well as some other causes, induces irritation, inflammation and thickening, in the intestinal villi, by which they ultimately lose their delicacy of sense. Absorption of inorganizable matter is the consequence. The influence of powerful narcotics is another cause of phthisis, but one which, I believe, acts directly in subduing the sense of discernment peculiar to the lacteals, without producing any irritation on them. The ultimate effects are, however, exactly the same as in the preceding case.

I have paid considerable attention to the state of the lacteals in those who have fallen victims to phthisis, and in subjects with tuberculated lungs. In examining the villi, inflammation has often been most apparent, and their natural appearance in other respects altered. And I have reason to believe, that the inflammation and ulceration so frequently found in the mucous coat of the duodenum, jejunum, ilium, and colon, in consumptive patients, often commence in the lacteals, although there can exist no doubt but that tubercular deposit in this membrane often aggravates such a condition, and may, in fact, be the sole cause thereof.

If the foregoing remarks are not so fully and minutely detailed as might have been desired, I can only plead, as an apology, the infant state of the present views, and the little time I can devote to putting my observations and ideas into words. I am, however, so confident of the accuracy of the principles I have laid down, and more particularly from the unprecedented success which has attended my practice founded thereon, that I am willing to submit them, as they stand, to the test of a more general, although not a more impartial trial. Everything requires time for coming to maturity, and the more generally the attention of the profession is devoted to a subject, the more correct will be the result.

The first allusion, as far as I have been able to ascertain, made to this theory, was by Sir Charles Scudamore, in 1840, in the first number of the *London Medical Gazette* of that year, in a paper written on the subject of Inhalation in Tubercular Phthisis. His words are, "It is incumbent on us to look comprehensively to the state of all the constitutional functions; to attack the tubercular diathesis; *to control, to the utmost of our power, the*

nutritive functions, from the first digestion of the food in the stomach to the succeeding processes of chylification, lacteal absorption, assimilation, and sanguification." In the words of this talented physician, which I have taken the liberty of representing in italics, I find the first and only dawning of the idea that a morbid action of the mouths of the lacteal vessels acts any part, or takes any share in the origin of phthisis; and I feel not a little confirmed in, and satisfied of, the soundness of the views entertained by myself for so long a time on this subject, when I find them sanctioned by so high an authority.

Again: when we consider how little is known, even of the healthy action of the lacteals, it is not surprising that the present inquiry should require much reflection to mature it. How does Bostock account for the absorption of chyle by these vessels? He tells us, good-naturedly enough, that they, *in some way or other*, possess the power. Bichat conceives that absorption is a vital function, in which there is a relation between the absorbing vessel and the fluid absorbed, which relation is of an elective nature.* Dumas supposes that the lacteals possess

* Bichat's Anat. Gen., tom. ii. p. 125.

an elective sensibility, and distinctly ascribes it to a peculiar sense, resembling that of vision.* Bostock says, "As far as we are able to judge, when particles, possessed of the same physical properties, are presented to their mouths, some are taken up, while others are rejected; and if this be the case, we must conceive, in the first place, that a specific attraction exists between the vessels and the particles, and that a certain vital action must, at the same time, be exercised by the vessel connected with, or depending on, its contractile power, which may enable the particles to be received within the vessels after they have been directed towards it."†

In the healthy condition, I do not believe that the lacteals will admit inorganizable matter. Magendie, Flandrin, and Dupuytren, have endeavoured, by their experiments, to prove that, under all circumstances, they reject it, but their experiments are directly opposed by those of Hunter.

My sole object is, to arrive at the primary cause of this malady, the very fountain from which pulmonary consumption derives its birth. Anatomy and physiology, I am confident, must alone be our

* Dumas' Physiol., tom. i. p. 397. † Bostock's Physiol., p. 622.

guide in this inquiry, and if any more rational view is offered than that which is here suggested, I shall be glad to entertain it, if supported by good evidence, and more particularly if confirmed by the result of practice. Truth is my only aim, and come from whom it may, it must be equally valuable.

PART III.

CIRCUMSTANCES OR CONDITIONS WHICH CAUSE THE SEEDS OF CONSUMPTION TO BE SEPARATED FROM THE BLOOD, AND LEAD TO THEIR DEPOSITION IN THE LUNGS.

Having thus fully considered in what way, and from what causes, inorganizable matter, or, as we have termed it, the seeds of consumption, become absorbed and mixed with the blood, the next subject of inquiry is the investigation of the conditions that lead to their deposition in the lungs.

It is this, the second stage of the morbid actions necessary for the production of consumption, which medical men have so universally considered as the very primary cause of the disease, and which has alone claimed their attention, to the exclusion of the more important inquiries which have occupied the

foregoing part of this chapter. The result has been, that the origin of phthisis has never attracted sufficient notice, and consequently its frequency has never diminished. It must be obvious, that till such time as the seeds of the disease gain access to the system, they cannot, under whatever circumstances, become deposited in the lungs, but had the means by which they do enter the system been attended to, discovered, and measures adopted to prevent such an event taking place, then consumption, to say the least, would have been much less frequent than has as yet been the case.

Sir James Clark says, that "the total inefficacy of all means hitherto adopted for diminishing the frequency, or reducing the mortality, of this class of diseases, is of itself sufficient incitement to us to seek for some other method of remedying the evil; and it is evident to me that this can only be done, with any reasonable prospect of success, by directing the attention to such measures as are calculated to prevent the hereditary transmission of the particular morbid state in which the formal disease originates, and to correct the predisposition

to it in infancy and youth." * Again, he says, in p. 2, that, " Notwithstanding the great advantages which have resulted from these pathological researches (of Laennec), they have tended to keep up the idea that consumption is a local disease, referable to a local cause; and thus the investigation of the constitutional origin of tubercles, by far the most important part of the subject, has been neglected. Before we can hope to acquire an accurate knowledge of consumption, we must carry our researches beyond the pulmonary disease, which is only a secondary affection, the consequence of a pre-existing constitutional disorder, the necessary condition which determines the production of tubercles. An imperfect acquaintance with this morbid state of the system has led to great discrepancy of opinion concerning the nature and causes of tubercles."

In consequence of the erroneous views hitherto entertained as to the origin of tuberculous matter, there has been an endless waste of discussion concerning the causes of consumption; such discussion, moreover, has been devoid of all the most neces-

* Op. cit., pref., p. xi.

sary primary facts, and consequently without the very basis of sound reasoning. But to come to the causes of a deposition of tuberculous matter in the lungs. They may, I believe, be referred to two distinct heads—namely, increased vascular action in the pulmonary tissue, and mechanical obstruction.

Increased vascular action, whatever may cause it, forces an unusual quantity of blood into the smaller vessels. When the eye, for instance, is irritated by a mote, or any other cause, increased vascular action follows; and who has not seen the eyeball become red and florid under such circumstances? This is the consequence of the smaller vessels, which in the healthy state did not admit red blood, being now gorged with it. A similar result takes place in the lungs, when they become the seat of irritation and consequent increased action in the vessels. The smaller vessels are distended with red blood, and if this state is kept up, increased secretion of mucus, and eventually of pus, is the result. And if this take place in an individual having inorganizable matter mixed with his blood, this matter, the seeds of consumption, ne-

cessarily constitutes part of the contents of the smaller vessels, as also of the increased secretion or effusion. I have no doubt but it is often mechanically arrested in the capillaries, and when thrown into the air-cells with the secretion, there it frequently remains. Such having taken place, the individual is now in the first stage of this malady. Tubercular matter may be often seen in the air-cells of those who have sunk under phthisis, mixed up with the secretions; and there is no doubt but it would have been more frequently noticed, were it not in some degree cloaked by the mucus or pus. From these observations it must be inferred, that whatever irritates the lungs, so as to induce increased vascular action, will, in such as have the seeds of phthisis mixed with their blood, establish the disease, if the irritation is sufficiently great, and continued for the necessary time.

The principal irritants to which the lungs are subjected are, sudden transitions of temperature and the inhalation of stimulating matter. In constitutions having inorganizable matter in the system, the air passages, and, in fact, all the mucous membranes, are peculiarly susceptible of excitement, but

I entertain no doubt, that if we can keep down increased vascular action in the lungs, and avoid mechanical obstructions to the seeds of the disease, phthisis may be obviated in almost every case, even where the absorption of inorganizable matter is great. In this case I have the support of practice, having had the medical direction of many families predisposed to this disease, in which it proved very fatal prior to adopting the necessary prophylactic treatment. Since this has been followed, however, I can assert that, with two exceptions, where I have reason to say the disease had actually made considerable progress before taking precautionary measures, there has not a single member shewn any symptom of the malady. I am far from wishing to imply that my treatment possesses any mystery; on the contrary, it is in strict accordance with the most acknowledged principles of the practice of physic. My practice, therefore, only differs in its immediate objects, and not in the means of attaining them. These objects are indicated by the preceding and subsequent views of the pathology of consumption, which point out what must be done to protect life from the ravages of

this malady. Still, the means pursued are open to all who will adopt them, and I venture to say, that success will often be the reward, if due caution is exercised on the part of the physician, and, what is equally necessary, strict compliance on that of the patient.

It must be granted that some determining cause is required to induce consumption, even after the absorption of the seeds of the disease, otherwise we should have every scrofulous patient consumptive. In them the seeds of consumption are abundant; nevertheless they very generally escape phthisis, and merely because they have not been subjected to circumstances which would cause their deposition in the lungs.

But mechanical obstruction may arrest the progress, and cause a deposition of the inorganizable matter, in the absence of any vascular excitement. This might be illustrated in the mesenteric glands. Here the seeds of the disease, passing on by the lacteals, very frequently become arrested in the minute vessels constituting these glands. The learned Dr. Cullen, who filled the chair of Practice of Medicine, in the University of Edinburgh, with

so much benefit to the world, and with so much credit to himself, was well aware of the fact, that the vessels of the mesenteric glands became obstructed by inorganizable particles, thus often preventing the transit of even healthy nutrition.

Since his day it has been falsely assumed that his opinion is incorrect, in consequence of Soemmering, Boeker, and others, having succeeded in passing injection through some of these glands, after death, which contained inorganizable matter, and they consider them but rarely impervious. Now the truth is, that they are frequently obstructed, as Dr. Cullen so well knew, and as I have often proved, by the most minute and delicate injections. But, even where they are not entirely obliterated, the irritation generally existing in them during life, as a consequence of tuberculous matter, prevents them from admitting the chyle, and it is a well-known fact, that an inflamed or irritable passage will resist, as far as possible, the admission of any matter. But after death this irritation of course ceases, and injection will then flow, where in life it would not have been admitted; and, moreover, the force that can be used in injecting wil

even overcome any contractions that may have been produced in these minute vessels. But those opposing Dr. Cullen's correct observations did not consider the effect of that irritation which existed during life, and consequently made no allowance for its absence after death; and although Dr. Cullen himself has taken no notice of it, still I have no doubt but the circumstance would have been most readily observed by him.

But to return to mechanical obstruction of inorganizable matter. We see that it is often mechanically arrested in the mesenteric glands, and such is also frequently the case in the lymphatic glands. Where it is absorbed in great quantities, the small vessels, which form these glands, arrest its progress, and constitute tabes mesenterica and scrofula. But during the natural and free circulation of the blood in the lungs, tubercular matter passes freely through the vessels in the pulmonary tissue. This I consider sufficiently demonstrated by the fact that, in scrofulous individuals, we have no arrestment of inorganizable matter in the lungs, and were the vessels which transmit it through their substance so small as not to allow a free passage to the inor-

ganizable matter, every scrofulous patient would be consumptive.

I have no doubt, however, that a compressed and contracted state of the chest, whether from the effects of posture, the pressure of corsets, malformation, or whatever other cause, will so interrupt the free circulation of the blood, as to arrest the progress of the seeds of consumption, while passing through the lungs, in very many cases.

The effects of a bent position in producing consumption has attracted very general notice, and been very frequently commented on by medical men. But it must be very apparent, that, however much bent the chest may be, or however malformed, consumption can never be a result until the seeds of the disease have been absorbed.

Corsets have generally been considered, by most medical men, as a fruitful cause of pulmonary consumption. I feel fully convinced that the health of females is often sacrificed to the unnatural caprice for narrow waists, and that, from the tightness with which they are so perseveringly squeezed into stays, the lungs are in particular prevented from fully performing their duty, whereby numerous evil con-

sequences follow. But it must be remembered, that neither compression of the chest, however severe, nor any other means, can produce tubercular phthisis, unless in a system already predisposed to that disease. Were not this the case, I doubt not but a vast proportion of the female population would fall victims to this malady before they arrived at the age of maturity. But females who are, unfortunately, the hereditary heiresses of pulmonary phthisis, or who, by subjecting themselves to the predisposing causes, have allowed the seeds of consumption to enter their blood, cannot be too careful in avoiding even the slightest compression of the chest. Stays, if at all tight, reduce, very materially, the cavity of the chest, and the lungs are forced up, and compressed into the smallest possible space. There is no organ in the body so susceptible of compression as are the lungs, and none where it can ultimately produce worse effects. For the free performance of respiration, the ribs and muscles of the chest must have unfettered room to act, and it must be apparent that, squeezed into corsets, it is impossible for them to perform that duty. Moreover, in consequence of pressure

being applied before the ribs and muscles are fully developed, and so unremittingly persevered in after, the chest becomes disproportioned and malformed, the muscles, in place of enlarging, are diminished in size and in power, and are unable to expand the unnatural-shaped thorax, so as to admit a sufficient quantity of atmospheric air.

The compressed lungs never having an opportunity of becoming inflated, the blood which ought to circulate through them freely and unimpeded, is now retarded in its course, and the probability is, that should there exist the seeds of consumption in it, they will be deposited to a greater or less amount in the pulmonary tissue.

The nature of this work prevents me from exposing the other and innumerable evils which result from the use of corsets, but they are very destructive of health, and not unfrequently prove fatal to the apparently willing victim. Soemmering,* in his usual masterly style, has ably treated this subject. It is worthy of remark, that Joseph II. wisely, although unsuccessfully, endeavoured to abolish the use of whalebone stays throughout his dominions.

* U'ber die Wirkungen der Schnübrüste. Berlin, 1793.

I am firmly convinced, that were such an attempt made in England, we should soon have all the fair daughters of Eve in open rebellion.

But, to do justice to the common sense of some, I must allow, that in several instances I have succeeded in persuading females, who were predisposed to consumption, to abandon the use of corsets. And it ought to be known, that not only has their health been protected, but their personal appearance very much improved. The natural figure which God Almighty intended them to possess has, with proper exercise, so far returned; but where compression has been long continued, and carried to an excess, the ribs, in some instances, never recover their natural shape. Timely precaution is therefore very necessary.

PART IV.

APPEARANCES, SITUATION, AND CONSEQUENCES OF INORGANIZABLE MATTER IN THE LUNGS.

Inorganizable matter seems to be deposited in two distinct forms in the lungs. We find it very generally congregated in small round bodies, each

formed by a collection of tuberculous particles deposited together. In other cases it is diffused throughout the substance of the lungs in minute grains, the consequence, no doubt, of general irritation in the pulmonary tissue, leading to indiscriminate deposition. When inorganizable matter is collected in bodies, they are termed tubercles, but when it is diffused through the substance of the lungs indiscriminately, it is then characterized by the name of tuberculous infiltration.

Tubercles differ very materially in size and shape: they are in some cases so small as scarcely to be obvious, while in others they vary in bulk from that of a millet-seed to that of a hemp-seed, a cherry-stone, filbert, or almond. When they exceed the latter size, which is but seldom the case, it is generally either the result of several tubercles uniting, or of tuberculous infiltration. If, however, we find them retaining their primitive round or ovoid shape, we may then, generally, infer that no such union has taken place, and that they are in reality unusually large tubercles.

The shape to which I have just referred is that which is generally presented by tubercles when in

the lungs, although they are not unfrequently angular. They seem to be moulded into this form by that of the part where the deposition occurs. This being the case, tubercles will present different appearances in different organs and tissues, which we find to be the case. After they have remained some time in the lungs, they very frequently become enveloped in sacs, which are at first very thin and delicate, but gradually increase in thickness and density, till, in some instances, they appear semi-cartilaginous. These sacs seem to consist of two coats, the internal being delicate and glistening, resembling serous membrane. It not unfrequently sends off folds, which divide the substance of the tubercles into separate cells or compartments, which in some instances do, and in others do not, communicate with each other.

The consistence of insulated tubercles, as the first variety of tuberculous deposit has been termed, differs according to circumstances. Originally these bodies are soft and mucilaginous, but gradually become more firm and solid, frequently approaching to a state somewhat less hard than cartilage. In consequence, however, of the action which they

induce in the surrounding pulmonary tissue, they ultimately become softened, presenting, at first, an appearance resembling a mixture of curds and whey, and lastly, a yellow matter, differing in no obvious respect from pus, with which it is, no doubt, now mixed, and giving it this appearance.

The variety in the size, form, and appearance, of insulated tubercles, has led pathologists, who are in some cases, unfortunately, too fond of complication, to subdivide them into classes. Laennec, for instance, makes four varieties of insulated tubercles, which he distinguishes by the names of Miliary, Crude, Granular, and Encysted. The subdivisions are of no practical utility, and, in fact, pathology does not warrant such distinctions.

In no respect do tubercles differ so widely as in the numbers met with in different cases. Sometimes we find a single tubercle, at others twenty or fifty, while it is by no means rare to see a very large portion of the lungs completely filled with them.

It is a fact worthy of notice, that inorganizable or tubercular matter almost invariably makes its first appearance in the superior lobes of the lungs.

has been for many years, taken in too great a quantity, and to excess, thereby producing more diseases than ever it will relieve,—such a man would confer a much greater benefit on the human race than any member of the profession ever has done. Medicines, when not absolutely requisite, either for the prevention or cure of disease, always produce some morbid condition of the system. In the alimentary canal, they come in direct contact with the mouths of the lacteals, and acting on them, frequently destroy the sensibility of these delicate organs beyond recovery. Their injurious consequences will vary, in a ratio with the nature and strength of the medicines consumed, the quantity taken, &c. One result is, however, always the same, except in degree—namely, the partial or complete loss of taste, or discernment in the mouths of the lacteals, and a consequent absorption of inorganizable matter, which, becoming mixed with the blood, circulates throughout the system, until it is either again discharged, or deposited in the lungs or some other organ. Sir James Clark remarks of calomel, that "there are few remedies more efficient," but he says that "the injudicious manner

in which children are dosed with it, and drenched with black draughts, is the destruction of many. Against this pernicious system of treatment," continues he, "I would enter my strongest protest."

There is, perhaps, no habit more universal than opium-eating in some districts of England. Although opium is not taken, by those who indulge in it, as a medicine, but as a stimulant, nevertheless, it is one which destroys the sense of the lacteals very readily. As it is one of the most powerful narcotics, we might naturally expect, if the views of the pathology of phthisis which I have laid down are correct, that opium-eaters would ultimately fall victims to pulmonary phthisis, the consequence of the direct narcotic effects of this drug on the nerves of the villi, whereby the lacteals would lose their sense of discernment, and consequently absorb inorganizable matter. And such is the case. In Lincolnshire, opium-eating is a very general habit among the lower orders, and where it is confirmed and indulged in for a length of time, I am informed tubercular disease is generally found to exist. Dr. Christison, of Edinburgh, has, with his usual ability, investigated so far the effects of

opium-eating on health and disease; but, as he justly remarks, it is singular how very little is known by the medical profession of the effects of this habit. In the first volume of the *Lancet* for 1831-32, p. 710, Mr. Mart observes, that "opium-eaters are generally affected with, or predisposed to, pulmonary complaints." Out of ten cases brought forward by Dr. Christison, there is only one of death where the cause of the mortality is known, and there the opium-eater "died, aged forty-three, of consumption." And in the cases given by Mr. Mart, pulmonary consumption was the cause of death in every instance. We have, therefore, the coinciding testimony of those who have attended to the effects of opium, proving that it does lead to the absorption of inorganizable matter. I therefore consider this a powerful argument in favour of the new views of tubercular disease which have been offered by me in this work.

The injudicious use of medicine, if persevered in, from whatever motive, also destroys the functions of the stomach, and in this way acts as an indirect, but certain, cause of inorganizable absorption. There are but few families, indeed, where

some member of it does not illustrate the baneful effects of over-dosing: but this, like inebriety, seems to be a passion which, although indulged in from different motives, is seldom subdued till the result is past remedy.

Abuse of Spirits. — Inordinate indulgence in spirituous liquors is a passion, that not unfrequently leads to the absorption of inorganizable matter. A very high authority, whom I have often quoted, says, that "among the causes of tuberculous cachexia, a free indulgence in ardent spirits holds an important place. There is," says he, "good reason to believe, that the abuse of spirituous liquors among the lower classes in this country is productive of consumption, and other tuberculous diseases, to an extent far beyond what is usually imagined." Spirituous liquors, although they no doubt act directly on the mouths of the lacteals, by bathing them, as it were, in this narcotic, and consequently destroying their sensibility, moreover impair the functions of the stomach and liver. These organs, the integrity of whose functions are so important to the healthy condition of the body, then become incapable of converting the most natural and

healthful of food into chyme, so that it passes along the alimentary canal unchanged in its properties, consequently destroying the sensibility peculiar to the mouths of these lacteals. Indulgence in spirituous liquors, therefore, very obviously leads to the absorption of the seeds of consumption in two ways, so that the drunkard has a double chance of falling a victim to one of the most dreadful scourges that ever afflicted humanity. Dr. Wilson Philip truly remarks, that "alcohol, in every shape, is unnecessary to those who are in health, and have never been accustomed to the use of it; and that, had no beverage but water ever been known, however we might feel the want of a stimulus, some of the most fatal diseases we are subject to would have been less frequent."

And the learned Dr. Willan, whose field of observation was very extensive, as physician to a large dispensary in this capital, confirms the general bad effects of this habit. He says, "on comparing my own observations with the bills of mortality, I am convinced that considerably more than one-eighth of all the deaths which take place in persons above twenty years old, happen prema-

turely, through excess in drinking ardent spirits. The stomach and bowels suffer first," says he, "from the use of spirits; and then their baneful influence is afterwards extended gradually to every part of the body, producing a variety of morbid phenomena." Well might Dr. Paris say—"happy is the man who considers water the best drink, and salt the best sauce." But as I am convinced that neither argument nor example will overcome this, the most baneful of all habits, there can arise no good from further remarks on the subject.

Excessive Fasting.—In considering the causes of inorganizable absorption, excessive fasting is well worthy of our notice. When the system demands a fresh supply of organizable matter, and this demand is not complied with, the mouths of the lacteals become excited, and on food being transmitted to the alimentary canal, they not only absorb inorganizable matter, but also inorganizable particles. They, in fact, do what a starved man would—namely, consume whatever comes within their reach, whether healthful or the reverse. But, fortunately, we have but few opportunities of observing the effects of an imperfect supply of food.

And when such painful circumstances do come under our notice, we find that they have been attended by so many other aggravating evils, such as cold, fatigue, &c., as to prevent our deciding what influence deficient nourishment alone may have exercised. But that inorganizable absorption is one result, and that to a great extent, there can be but one opinion. Dr. Cumin also adds his testimony to the frequency of tubercular matter being a consequence of imperfect nourishment.

Having now illustrated how certain agents, which act directly on the mouths of the lacteals, destroy the natural sense peculiar to these vessels, and induce in them a morbid indifference, we are consequently furnished with the causes which are most active in promoting the absorption of the seeds of consumption. We have, in the second place, to investigate those which act indirectly in producing such an effect. It may therefore be observed, that whatever has the power of destroying the natural action of the stomach, and preventing the full digestion of the food, will, if long continued or often repeated, have a tendency to the same result. It has already been stated, that there is no more

powerful cause of the destruction of the inherent faculty of discriminating between organizable and inorganizable matter,—a faculty peculiar to the lacteals,—than is the direct contact of these vessels with undigested food. Dyspepsia must, consequently, be a fertile source of such a morbid contiguity, and it must appear altogether unnecessary to enter into a detail of all the circumstances which would induce indigestion. They are so numerous, as well as so familiar, that I shall consequently, by way of illustration, content myself with considering merely the two following:—

Deficient Exercise.—This is a very frequent and powerful cause of the absorption of inorganizable matter. There is nothing tends more forcibly to weaken the action of the system, and to impair the organs of digestion. Sir James Clark says, "If a due supply of proper food and pure air are necessary to nutrition, bodily exercise is scarcely less so." Dr. Cumin truly remarks, that "the mischievous effects of the want of air, and sun-light, and healthful exercise, may be seen among the rich as well as the poor, though not to the same extent. The confinement, mental fatigue,

and anxiety, to which female children, in particular, are so unremittingly subjected during their education, prove fertile sources of scrofula in boarding-schools ; and even in the families of the higher classes, bodily health is too often sacrificed to the idol of accomplishment, and the intellectual powers, perhaps originally of excellent quality, are forced into a state of extreme culture and morbid precocity, destructive of all genuine soundness and vigour." The inquiring Louis observes, that " of all the causes which seem directly active in the production of phthisis, this (a sedentary life) appears the most general and influential. In our manufactories," says he, " there is no doubt that a far greater number of consumptive patients is produced by the want of exercise, and a confined posture of the body, than by those special, and in general local, influences to which the disease has been so often erroneously attributed." *

Excessive Labour.—Most persons have experienced the effects of over-exertion. One very general and almost universal consequence is, the total loss of appetite for food. And when bodily fatigue

* Louis' Pathological Researches on Phthisis, by Cowan, p. 343.

is kept up for weeks and months, the stomach becomes so affected, that food, when subjected to its influence, passes through this organ but little altered in its properties, and consequently proves destructive to the sense peculiar to the villi. And although in this case, as under the conditions already inquired into, inorganizable matter may not manifest its existence in the system, by becoming deposited in any particular organ, nevertheless, excessive labour is as sure a cause of the absorption of inorganizable matter as almost any other.

The intimate connexion which subsists between dyspepsia and pulmonary consumption has not failed to attract very general notice. I am not aware, however, that they have been ever considered in the relation of cause and effect. Dr. Todd has particularly adverted to the union between tubercular complaints and dyspepsia, and he has even given the name of Strumous Dyspepsia to that which I believe induces the disease. He says that it "presents a more characteristic feature of this habit of body (tubercular), than any physiognomical portrait which has yet been drawn of it. Upon whatever temperament the disordered

habit we call scrofula may engraft itself, we venture to say that this form of dyspepsia will also there be found; and therefore, being constantly present with it, preceding and accompanying the various symptoms which issue from it, it would be contrary to all reason to refuse to it an important share in the development of this disordered habit, and in the production of the local affections which have hitherto too much engrossed the attention, to the exclusion of a proper consideration of the constitutional disease." *

This quotation I consider invaluable in the support of the pathological views offered in this treatise. It shews how intimately the state of the alimentary canal is connected with the absorption of inorganizable matter, and that this state *precedes* the various symptoms of tubercular disease. In my opinion, there can be nothing clearer than the source from which the seeds of consumption flow, and if we can stop the morbid influx, we shall accomplish more in subduing the mortality from this awful malady than has yet been done.

An opinion has already been offered, as to the

* Cyclopædia of Medicine, Art. INDIGESTION; vol. ii. p. 654.

probable organic changes which may take place in the villi of those hereditarily predisposed to tubercular disease. These, as has been stated, may be confined to the nerves, or may be only attributable to a thickening of the tissue in which the nerves are developed. Where the disease is acquired, I am disposed to believe that undigested food, or other matter unnatural to the lacteals, produce, in some instances, irritation and inflammation in the latter. The natural consequence of this would be thickening of the villi, by which the sensibility of their nerves would be diminished, and absorption of inorganizable matter the consequence.

In other cases, again, where narcotic substances have been long indulged in, they may act directly in destroying the sensibility, and, consequently, the discerning power of the lacteals, as, I have little doubt, happens with opium-eaters. Their liability to pulmonary consumption is ascribable to some cause; and if we admit this as correct, we can explain it on reasonable grounds.

From the foregoing views, we would therefore attribute the production of phthisis, in many cases, to functional derangement of the stomach, and

other organs connected with digestion. This, as well as some other causes, induces irritation, inflammation and thickening, in the intestinal villi, by which they ultimately lose their delicacy of sense. Absorption of inorganizable matter is the consequence. The influence of powerful narcotics is another cause of phthisis, but one which, I believe, acts directly in subduing the sense of discernment peculiar to the lacteals, without producing any irritation on them. The ultimate effects are, however, exactly the same as in the preceding case.

I have paid considerable attention to the state of the lacteals in those who have fallen victims to phthisis, and in subjects with tuberculated lungs. In examining the villi, inflammation has often been most apparent, and their natural appearance in other respects altered. And I have reason to believe, that the inflammation and ulceration so frequently found in the mucous coat of the duodenum, jejunum, ilium, and colon, in consumptive patients, often commence in the lacteals, although there can exist no doubt but that tubercular deposit in this membrane often aggravates such a condition, and may, in fact, be the sole cause thereof.

If the foregoing remarks are not so fully and minutely detailed as might have been desired, I can only plead, as an apology, the infant state of the present views, and the little time I can devote to putting my observations and ideas into words. I am, however, so confident of the accuracy of the principles I have laid down, and more particularly from the unprecedented success which has attended my practice founded thereon, that I am willing to submit them, as they stand, to the test of a more general, although not a more impartial trial. Everything requires time for coming to maturity, and the more generally the attention of the profession is devoted to a subject, the more correct will be the result.

The first allusion, as far as I have been able to ascertain, made to this theory, was by Sir Charles Scudamore, in 1840, in the first number of the *London Medical Gazette* of that year, in a paper written on the subject of Inhalation in Tubercular Phthisis. His words are, "It is incumbent on us to look comprehensively to the state of all the constitutional functions; to attack the tubercular diathesis; *to control, to the utmost of our power, the*

nutritive functions, from the first digestion of the food in the stomach to the succeeding processes of chylification, lacteal absorption, assimilation, and sanguification." In the words of this talented physician, which I have taken the liberty of representing in italics, I find the first and only dawning of the idea that a morbid action of the mouths of the lacteal vessels acts any part, or takes any share in the origin of phthisis; and I feel not a little confirmed in, and satisfied of, the soundness of the views entertained by myself for so long a time on this subject, when I find them sanctioned by so high an authority.

Again: when we consider how little is known, even of the healthy action of the lacteals, it is not surprising that the present inquiry should require much reflection to mature it. How does Bostock account for the absorption of chyle by these vessels? He tells us, good-naturedly enough, that they, *in some way or other*, possess the power. Bichat conceives that absorption is a vital function, in which there is a relation between the absorbing vessel and the fluid absorbed, which relation is of an elective nature.* Dumas supposes that the lacteals possess

* Bichat's Anat. Gen., tom. ii. p. 125.

an elective sensibility, and distinctly ascribes it to a peculiar sense, resembling that of vision.* Bostock says, "As far as we are able to judge, when particles, possessed of the same physical properties, are presented to their mouths, some are taken up, while others are rejected; and if this be the case, we must conceive, in the first place, that a specific attraction exists between the vessels and the particles, and that a certain vital action must, at the same time, be exercised by the vessel connected with, or depending on, its contractile power, which may enable the particles to be received within the vessels after they have been directed towards it."†

In the healthy condition, I do not believe that the lacteals will admit inorganizable matter. Magendie, Flandrin, and Dupuytren, have endeavoured, by their experiments, to prove that, under all circumstances, they reject it, but their experiments are directly opposed by those of Hunter.

My sole object is, to arrive at the primary cause of this malady, the very fountain from which pulmonary consumption derives its birth. Anatomy and physiology, I am confident, must alone be our

* Dumas' Physiol., tom. i. p. 397. † Bostock's Physiol., p. 622.

increased heat in the palms of the hands and soles of the feet during the night, with a countenance indicative of serious organic disease. Although, on a superficial examination of the aggregate symptoms, and appearance of the patient, I could have believed that the lungs were diseased, still more was required to satisfy me that such was decidedly the case, favoured though I was by the opinion of the medical attendants, which was still further confirmed by the conviction of the patients and relatives. On examination of the lungs by auscultation, I was decidedly of opinion that they were perfectly sound in both cases; and when I considered the formation of the chest—in one case beautifully developed—the pedigree, habits, and occupations of these patients, together with the history of the present diseases, I felt fully convinced that they had been treated for a complaint, from which they were perfectly free. The question immediately put to me was—"If this is not a case of consumption, pray what is it?" This led to further inquiry; when, by minute examination of other organs, I found myself warranted in pronouncing these cases to be nothing more than disorder of the

stomach. In the one case, there was irritation, and, as I inferred, chronic inflammation of its mucous coat, while the other seemed to be the result of functional derangement, produced by improper diet, and kept up by mal-treatment. That this opinion was correct, I afterwards felt satisfied; for, in a few weeks, both patients perfectly recovered under the new treatment adopted—not at my suggestion, but by their own attendants, on taking a new view of the cases. I may illustrate this subject still further, by a case given by Dr. Spillan, in his work on Pathological Semeiology: "We once remember," says he, "the case of a patient who presented a group of symptoms, such as dyspnœa, violent cough, copious expectoration, great exhaustion and emaciation, together with night sweats, which his medical attendant decidedly pronounced to indicate phthisis; the patient was directed to give up his business, and retire to the south of France. This occurred just at the time when the stethoscope was beginning to gain some ground in this country, in spite of powerful and virulent opposition from those practitioners who were either too lazy, too stupid, or too old, to

submit to the labour of studying it. The patient was submitted to a stethoscopic examination; we detected absolute dulness of sound on percussion on the right side, over the lower part of the right lung, both anteriorly and posteriorly, with distinct puerile respiration in the upper part of the same lung, commencing dulness on the left side, &c. Here our diagnosis was, hepatization of the lower portion of the right lung, and that the case was originally a simple pneumonia, which, because some relative of the patient had died of phthisis, the family physician took for granted, without further examination, to be a similar affection. By the adoption of the proper means, the patient was restored to health and his family—though it is evident that, had he gone on much longer, he would have fallen a victim to the disease, and to the ignorance of his symptomatic attendant, whose diagnostic powers would have gained still further credit from the very fact which should have for ever damned him as a practitioner."*

We may now infer that consumption, particu-

* Outlines of Pathological Semeiology; translated from the German of Professor Schill, with copious notes, by D. Spillan, M.D., A.M., &c.

larly in the early stage, cannot be so readily discriminated from some other diseases as has been supposed; and that many who have been treated for, and supposed to die of, this malady, have, on the contrary, died with sound lungs. But diagnosis is the most difficult part of the practitioner's task; while, at the same time, it constitutes the first duty he has to perform to his patient. An error here is often attended with serious, and even fatal consequences; and, as Seneca observes, "serum est cavendi tempus in mediis malis." Such being the case, I shall endeavour to lay down, as plainly and intelligibly as I can, the best method of forming a correct diagnosis as regards pulmonary consumption. And, as prevention constitutes a most important part of the physician's duty, I believe I shall most effectually contribute to this useful purpose—first, by describing the circumstances, conditions, and appearances, which indicate a disposition to phthisis; secondly, by reviewing those symptoms which are so generally found to characterize an established consumption, and, lastly, by pointing out the method of examination which we must pursue, so as to enable us

to arrive at a true conclusion, founded on the evidence adduced. The latter is, in fact, as indispensable as the preceding; the one constituting the evidence, as it were, in a trial at court—the other, the summing-up and judgment. And as the physician here stands, at one and the same time, in the responsible position of judge and jury, and not as in a matter of property, but in a case of life and death, he ought to be fully impressed with a due sense of his vast responsibility, and, accordingly, give his undivided attention and deepest thought to the consideration of so momentous a question.

CONDITIONS INDICATIVE OF A PREDISPOSITION TO CONSUMPTION.

From what has been stated in a former chapter, relative to the predisposing causes of consumption, we may generally determine, after a thorough investigation, whether or not any given individual is so predisposed. It would no doubt prove difficult in some cases to decide on the exact condition which would warrant us in pronouncing a predisposition to phthisis, as actually established and existing.

The peculiarity in the organization which leads to a predisposition, may descend by birthright as an hereditary possession, and exist even before birth; or it may be acquired at any subsequent period of life. Whichever of these two circumstances may be taken into consideration, I do not think that we are warranted in declaring a predisposition to consumption as established, till such time as inorganizable matter is absorbed, in however small a degree, by the lacteals; but whenever any proportion of it is deposited in the lungs, then the term of predisposition is past, and the disease is actually existing. Where it is desired to find out whether or not an hereditary predisposition to consumption exists, the physician ought, in the first place, to learn the genealogy of his patient; and should he discover that the ancestors of the individual have been subject to hereditary phthisis, the presumption is, that the present heir will inherit, or does already possess that morbid condition of the mouths of the lacteals, and condition of chest, which admits inorganizable matter into these vessels, and causes its deposition in the lungs. But we must not forget that the father or mother, or both, of a nu-

merous family, may have died of consumption, and the offspring remain free from any hereditary peculiarity of organization, that would in the least tend to the absorption of tuberculous matter: for if the parents have died of acquired phthisis, it will never influence the health of their progeny. Acquired phthisis never, to the best of my knowledge, shews a tendency to prove hereditary, or, in other words, to arise from hereditary causes, unless where gestation is going on. The fact is, however, undoubted, that by exciting this malady successively in a regular line of descent, which might happen from hereditary family avocations, a disease which originally was the consequence of some casual circumstance, will ultimately prove itself hereditary, or at least, the result of a peculiar morbid hereditary organization. When we have detected this liability to the absorption of inorganizable matter, our suspicions will of course be excited; nevertheless, there may not as yet have commenced any unhealthy action of this sort. If, however, the countenance betrays that unhealthy aspect peculiar to scrofulous and consumptive invalids, and recognisable only by those accustomed to watch such

indications; if the alvine secretions are more or less unnatural, and the system irregular in its functions, then, putting the whole facts together, I should unhesitatingly consider such an individual predisposed to pulmonary consumption.

Where phthisis has not hitherto afflicted a family, and where there is no reason to suspect any hereditary taint, then we require more powerful evidence of the absorption of inorganizable matter, than in the former instance. The condition of the alvine evacuations must be observed—the action of the stomach, the state of the glands, more particularly of the mesenteric glands—the general state of health, and appearance of the countenance, all of which will in some degree be affected and altered, though not unfrequently in so slight a degree as neither to attract the notice of the individual so affected, or of the observer, who has not directed his particular attention to this subject. It would therefore prove useless to enter further on a subject which can only be learned by practical experience and repeated observation; although we must allow, that it is a subject paramount in importance to most others.

I have, secondly, to consider the symptoms indicative of phthisis being actually established, a duty I would willingly have declined, so critical is it, especially as regards the early state of the first stage; and so apt are they who have not made frequent personal observations to be misled by even the most guarded description in arriving at a correct diagnosis. We shall first review the external signs of the disease; and secondly, the physical indications, to all of which, conjointly, we must trust in drawing our inference as to the nature of the case.

Cough.—This is generally one of the first consequences of the irritation produced in the lungs by the deposition of inorganizable matter. In the commencement it is generally very slight, and in nine cases out of ten, looked upon as the effect of a common cold. So frequently indeed does the disease first manifest itself by a dry cough, that the ancients considered it the cause, and not the effect, of consumption. Sometimes the cough will continue for months, no other symptom presenting itself. In the commencement it will often be found restricted to the morning, after the patient's getting

out of bed; and again returning at night, on lying down between cold sheets. It however gradually becomes more lasting, and occurs during the day, being excited by the most trifling causes, and ultimately may be considered as constant, increasing in severity with the pulmonary disease which excites it. Although I have stated that in the commencement the cough is generally dry, nevertheless expectoration will generally be found to come on at no distant period from the first attack. Great weight has been attached to the presence of cough, by those who trust too implicitly to symptoms, and it has even been thought by many, that absence of cough is a certain, though neutral, indication of sound lungs. Let me, however, give a caution to all those who entertain such an opinion; for it may truly be asserted, that there is no one symptom of consumption that may not be individually absent even till within a few days of death. To strengthen this statement, I shall quote Louis' remark, relative to cough in consumption. He says, "It varied much; some patients only coughed towards the close of life, although cavities had existed for some time. Others, and they were not numerous, coughed

very little, or even, after a certain time, *not at all*, until the disease approached its termination." * This he illustrates by the cases of two females, (Observations xxxi. and xxxii.) where the absence of cough was singularly demonstrative of this fact, and both of whom died of consumption, the one with several excavations in the lungs, the other with a great number of encysted tubercles, some of which were excavated, others softened, while the remainder were still crude. We therefore see that even this symptom, the most constant of all the attendants on consumption, is not to be too implicitly relied on; and it ought to caution us against forming too hasty an inference where it is absent. On the other hand, we have seen from preceding observations, that the presence of cough is no certain criterion of disease in the respiratory organs, as it is often the sympathetic effect of dyspepsia, of disease of the heart, and of many other complaints wholly unconnected with the lungs. It is therefore only a collateral indication or symptom of disease in the respiratory organs, and taken singly, is totally useless in enabling us to form our diagnosis, al-

* Op. cit., p. 125.

though, conjointly with other symptoms, of the greatest importance.

Expectoration.—There are few symptoms which have been considered more worthy of attention than the nature of the expectorated matter. It would be useless to refer to them, as the advanced state of pathological knowledge has in a great measure proved, that the opinions formerly entertained on this subject were grossly incorrect; nevertheless, too great stress is even still laid upon it by modern physicians of first-rate abilities. To be brief, I shall just observe that the expectoration in phthisis does not differ in any one individual respect from that consequent on bronchitis, and that as an indication of consumption it is totally useless. Where pus is expectorated, consumption used to be considered as fully established; but we may have pus secreted by any mucous membrane, merely as a consequence of inflammation. Do not the mucous linings of the urethra and vagina secrete pus when affected with gonorrhœa?—and in inflammation of the conjunctiva, do not the eyes discharge purulent matter in great abundance? So it is with the air passages; hence the nature or quantity of the

sputa is, in my opinion, unworthy of even the least consideration in leading us to a correct diagnosis. On reading many modern works on consumption, we find detailed accounts of the different colours, consistencies, and gradual changes that take place in the expectoration; the consequence is, that those who have not had great experience, or neglected to make correct observations in pulmonary diseases, would be disposed to think, from the minute and apparently learned comments offered on the subject, that it is one paramount in importance to all others. I should wish, however, to divert attention from it in forming a diagnosis, as it will frequently mislead those who are not accustomed to pulmonary practice. No doubt, in treating consumption we ought to consider the quantity of matter expectorated; for if it is great, we must recompense the system for the loss, but with this, all interest in it ceases. There are some rare and aggravated cases of consumption, where expectoration has been entirely absent, as observed by Portal, Sir James Clark, and others, and where, after death, the lungs have been filled with abscesses. My opinion is, that expectoration may be wholly

absent in the first stage of the disease, and equally so in the second, till such time as an abscess forms an opening into a bronchial tube; but this having taken place, I believe that subsequently expectoration will always attend this disease. In infants it may not attract notice, in consequence of their swallowing it.*

* The following account of the expectoration in pulmonary consumption is condensed from "Fournet's Clinical Researches on Phthisis," Part 2.

The value of the expectoration, as a means of diagnosing phthisis, has been variously represented by medical writers. If, however, we consult what has been written on the subject, we discover nothing but vagueness and uncertainty. The expectoration appears under a great many different forms, none of them of any value, because none of them fixed or constant. This variety in the characters of the expectoration is more especially remarkable, according as we approach the first stage of phthisis. The expectoration is sometimes wanting altogether, even in the most advanced periods of the disease. At other times it retains the mere salivary appearance throughout the entire course of the disease, with the exception of the catarrhal periods. It is sometimes a little viscid, sometimes clear, sometimes turbid, sometimes homogeneous, sometimes mixed with small greyish, blackish, or opaque, dull, white sputa, which are occasionally met in the expectoration of individuals, whom we have no reason whatever to consider phthisical. The sputa are sometimes full of blood; at other times, from the very commencement of the disease, they are whitish, thick, and as it were a little pearly; in some patients they put on the appearance of small masses, with uneven, jagged edges; whilst in others, those small masses are regularly rounded. Sometimes, when catarrh occurs, the expectoration assumes all the characters observed in the sputa of bronchitis. The expectoration may be wanting, even in cases where the lungs are the seat of large cavities. Amidst such a variety of forms and characters it is scarcely possible to meet any sufficiently fixed to merit attention on

HURRIED RESPIRATION.—This is another attendant on tubercles in the lungs; and where they are deposited in considerable quantity, it is seldom absent. At first it is so slight as not to attract attention, although on the least exertion it is quickly aggravated. But like most other symptoms of phthisis,

the part of the practitioner. In a considerable number of phthisical patients, however, the expectoration goes through the following stages:—At first, it is merely salivary, then a little viscid, but transparent and homogeneous; sometimes marked, at this period and a little later, with some streaks of blood, then becoming a little more abundant; towards the transition from the first to the second stage of phthisis, instead of the clear, frothy fluid hitherto observed, we observe some whitish, opaque points, about the size of a pin's head, of a rounded or flattened form, which give a pearly appearance to the ordinary expectoration. These points increase in number and size, resembling grains, of a dull, white colour, and sometimes of a dark grey, which, becoming every day more numerous, and larger, after a certain time put on the appearance of small, irregularly-rounded masses, jagged at their edges, and varying in size from that of a lentil to that of a one or two franc piece. These small opaque masses seem to float in the midst of a transparent, viscid fluid; they are sometimes a little streaked with blood; we are then coming towards the end of the second stage of phthisis: sometimes cavities are already formed in the lungs; then, to complete the series of its changes, the expectoration has only to take on the purulent character, which it is known to have at this period. M. Fournet positively asserts that the *physical characters* of the expectoration can furnish no assistance whatever in diagnosing the first stage of phthisis.

According to recent microscopical researches instituted by M. Kuhn, this observer states that he has discovered, in nascent tubercle, traces of real organization; he affirms that the tubercle is formed by an agglomeration of irregular, yellowish corpuscles, to which he gives the name of *tuberous tissue*, and that these corpuscles are united together by extremely fine fila-

it is not restricted to this disease; for the lungs sympathizing with so many distant organs, it may be the result of an affection totally unconnected with the respiratory organs. It therefore merits consideration as collateral evidence, and where it is met with, the cause ought invariably to be mi-

ments. He then set about inquiring whether he could not find in the sputa the corpuscles, which, according to him, form tubercles. He says that, "at the period when the sputa of phthisical patients are not yet purulent, and when, by mere inspection with the naked eye, we cannot distinguish them from the sputa of bronchitis, the microscope detects the same tuberous tissue which forms the basis of tubercle." However, even though we may admit the possibility of diagnosing phthisis by this test, still it never can suffice to enable us to detect the disease in its first stage, since we cannot for a moment suppose that parcels of tuberculous matter can be found mixed with the sputa, before the tubercles scattered through the lungs have at least commenced to soften.

M. Gueterbock has endeavoured to establish, by recent investigations, the differences between pus and mucus. The result of his research on this important subject is—that the greasy or fatty matter which exists in considerable quantity in pus, and not at all in mucus, is the character by which we are best enabled to distinguish these two products from each other. "The presence of fat in pus," he says, "makes this liquid to burn with a bright flame, similar to that of resinous bodies, whilst mucus, when it burns, furnishes only some inflammable gases." However, admitting the truth of this test, it is of no value in distinguishing phthisis, as every pathologist knows that in certain cases, independently of any trace of tubercle, the bronchial mucous membrane secretes real pus; as, for instance, in certain cases of dilatation of the bronchi, when accompanied with ulceration of the lining membrane. Thus neither the physical nor chemical qualities of the expectoration can afford any certain diagnosis of pulmonary phthisis.

nutely inquired into, as it not unfrequently leads to the discovery of a malady in its infancy.

Hæmoptysis, or spitting of blood, is a very usual attendant on consumption, so much so, indeed, as to have been considered the cause of this disease, before its pathology was understood. This opinion, no doubt, arose from the circumstance of its often preceding the other symptoms. Hæmoptysis is invariably either the consequence of congestion in the lungs, or of lesion of those organs, whereby blood escapes into the air passages. Any condition, therefore, tending to produce congestion in the lungs, or lesion of the mucous lining of these organs, will tend to produce hæmoptysis. It is therefore very obvious that it may be present and phthisis absent; consequently it is, like every other external symptom of this disease, not to be relied on. Portal says, that those who habitually spit blood rarely become the subjects of consumption, and he gives us the following quotation from Baillou:—"Magnas excretiones sanguinis ex pulmone minus esse periculosas quàm parvas." Although hæmoptysis may be the result of congestion in the lungs, or of increased vascular action, and

therefore wholly unconnected with consumption, nevertheless they are so frequently united, that its presence ought to make us more suspicious, and ought on no account to be overlooked.*

Pains in the Chest.—Although pains in the chest are generally met with in phthisical patients, still the disease is, in most cases, advanced to the second stage before they attract much notice, unless the irritation produced by the tubercles in the first stage is considerable. The patient usually attributes these pains to rheumatism, and therefore pays but little attention to them. When they are the consequence of consumption, they result from inflammatory attacks produced by that disease. They, therefore, like other symptoms, prove no particular

* The value of hæmoptysis, in diagnosing the first stage of phthisis, is much less than some medical writers would have us suppose. We all know that hæmoptysis frequently arises from diseases of the heart. Pulmonary apoplexy is often accompanied by profuse hæmoptysis. Bronchial hæmorrhage, supplementary of suppressed menstruation, is an every-day occurrence in females presenting not a single trace of consumption. Laennec, however, positively states, that nearly every time he observed females spit blood at each menstrual period, he satisfied himself that they had tubercles in the lungs. Though hæmoptysis, connected with tubercles, sometimes appears suddenly in the midst of apparently perfect health, still the general rule is, that tubercular hæmoptysis is preceded by certain local or general symptoms, which of themselves are calculated to make us suspect the nature of the case.

organic change in the pulmonary tissue. I have at the present time a female under my care, whose case (phthisis) has reached the last stage, and up to this time she has never felt the slightest pain, unless in the stomach. This is not, however, particularly rare.

Quick Pulse.—Much importance has been attached to a quick pulse in forming a diagnosis in phthisis. The fact is, that I consider the regard so commonly paid to this symptom as altogether extravagant. Let me only observe, that where the pulse is permanently more quick than is natural to the individual under examination, we may very naturally suspect the existence of some disease, either organic or functional. And where there are indications of morbid action in the lungs, this circumstance would greatly strengthen our suspicions.

Hectic Fever and Perspirations must not be overlooked in forming a diagnosis, although individually they are not confirmatory of a single fact beyond their own existence. Combined with the other attendants on phthisis they are, however, highly valuable.

Diarrhœa.*—This is a consequence of tubercular disease, which is altogether unnecessary for establishing a diagnosis, as, long before it comes on, the malady is so far advanced as not to leave a shadow of doubt relative to its nature. The same may be said with respect to emaciation, inversion of the nails, œdema, &c.

Having now reviewed the external and more obvious symptoms of pulmonary consumption, let me ask, is there any single one to be depended on, apart from the others, so as to enable us to pronounce the malady to be pulmonary phthisis, and may not any given symptom be absent, and consumption, even in the last stage, exist? How difficult, therefore, must it be for those who cannot avail themselves of some more decisive evidence of the existence of this disease, to form a correct judg-

* The diarrhœa sometimes observed during the first stage of phthisis, differs essentially from that which ordinarily accompanies the second and third stages of this affection. The latter is, generally, the effect of tuberculization of the intestines; whilst the former, on the contrary, seems, at least in certain cases, entirely independent of any perceptible organic alteration of the intestines. This is one of the many other instances in pathology where the symptoms cannot be explained by pathological anatomy, and affords another proof of the truth of the proposition, that a function may be more or less seriously altered without the organ which performs it presenting any appreciable change in its structure.

ment in any given case! No one symptom can be relied on, and it is only on their simultaneous congregation that we can form even a doubtful inference. Reflect, for instance, on the three cases related in the beginning of this chapter, and there we find a host of symptoms, all combined, which mislead the symptomatic physician, much more the non-professional, who but too often draw inferences for themselves. Fortunate it is, however, for the interests of humanity and the credit of the medical profession, that art carries the physician who will and can avail himself of it further than these doubtful indications, which, although by no means to be neglected, are comparatively valueless in themselves.

The air, in respiration, produces a crackling sound in the lungs, and which in health is always the same, and can be distinctly heard on applying the ear to the chest. Any deviation from or variation in the sounds proper to health, must therefore indicate some diseased condition in these organs. Whoever makes himself familiar with the healthy sounds will readily detect any change or alteration, and be enabled confidently to infer that

some morbid condition exists. A knowledge of the structure of the lungs, of their healthy actions and morbid conditions, will prove highly useful in enabling the practitioner to decide on what morbid condition any peculiar alteration of sound may depend. But by noting the peculiar characters of the unhealthy sounds, and making correct observations in such cases on post mortem examination, and by repeated investigations of this description, the physician is eventually qualified to form a diagnosis, supported by sound reasoning, and confirmed to a demonstration by incontrovertible evidence. But the present and succeeding races of medical men are now, in a great measure, saved from the tedium of making such investigations on the dead as would be necessary to enable them to form a correct judgment in such cases, the task having already been performed and the conclusion most correctly drawn, so that the labour is very much diminished by taking advantage of the investigations of others.

Hippocrates, well aware of the difficulty of arriving at a correct opinion in diseases of the chest, seems to have been the first who had recourse to

examining the healthy sounds produced by the lungs, in respiration, and as altered by disease. As the merit of this method of investigation has very generally been erroneously bestowed on another great authority, of modern date, although disclaimed even by himself, I shall just quote Hippocrates' own words, wherein he recommends this plan. He says, "Τούτω ἂν γνοιῆς, ὅτι οὐ πῦον, ἀλλὰ ὕδωρ ἐστι καὶ ἦν πολλὸν χρόνον προσέχων τὸ οὖς ἀκουαζη πρὸς τα πλεῦρα, ὥζει ἔσωθεν οἷον ψορος." Although the assertion here made may be incorrect, nevertheless the sentence compels us, in justice to Hippocrates, to award to him an honour so undoubtedly merited. It is not a little surprising that, although he has thus distinctly directed our attention to this method of investigation in thoracic disease, it should have escaped the notice of all succeeding physicians for a period of twelve hundred years, until Laennec adopted the same plan, and has thus been the means of reviving and bringing it into what I trust I may call general practice; for I believe that there is no physician, unless he be deaf, or too indolent to learn, who will not adopt this powerful and valuable auxiliary.

As we arrive at the facts furnished in the way

above described, by listening to the sounds produced by respiration, the voice, and by coughing, so the term applied to it is auscultation, and as the conditions of the affected organs are indicated by the quality of the sounds returned, so we classify them under the head of acoustic signs. As might naturally be expected, since Laennec introduced auscultation, a host of authors have appeared on the subject, and it must be admitted, they have all fallen into the same error—namely, that of rendering that which is in itself plain and simple, to say the least, comparatively difficult to understand and acquire. I am glad to find that Dr. Latham has reprimanded this injudicious policy in his talented work on Clinical Medicine. He says, " I am convinced that the whole subject of auscultation would have been better understood if a little less artifice had been used in the methods of teaching it." Nevertheless, these writers who have done so much to retard the adoption of auscultation, are the very individuals who patronise it the most. Dr. Forbes says, relative to the same subject, " In science, as well as in religion and politics, over-zealous and injudicious friends are often more injurious to the

cause they advocate than its most determined enemies."

As it is not the object of the present treatise to teach the art of auscultation, and as one week's actual practice is infinitely more valuable than the best written work on the subject, it will suffice here to point out the changes in the sounds indicative of tubercles and of ulceration in the lungs.

SYMPTOMS OF TUBERCLES FURNISHED BY AUSCULTATION.—In the commencement of tubercular phthisis, while there is but little inorganizable matter deposited in the pulmonary tissue, and that separated by portions of healthy lung, it is utterly impossible to detect the existence of the disease by auscultation in this the very commencement of the first stage; and Laennec himself candidly says, "small tubercles, separated from each other by portions of healthy lung, cannot be recognised." Certainly no advantage can accrue, either to science or the patient, by such gross professions as are daily made relative to detecting the smallest deposition of inorganizable matter. Those who indulge in such boasts only expose their own want of veracity or judgment, and render themselves contemptible to

every lover of truth and to the well-informed and candid members of the medical profession. In this early period of the first stage we can have recourse to no other means of detecting the probable existence of tubercles, than by availing ourselves of the symptoms characterizing a predisposition to the disease, which symptoms will, in the event of inorganizable matter being deposited, become generally so aggravated as merely to enable us to form a conjecture. But when tubercles are deposited to a considerable extent, so as to obstruct the free circulation of the air, then auscultation will assist us in establishing a correct and satisfactory diagnosis.

We have already seen that tubercles are almost invariably deposited, in the first instance, in the superior lobes of the lungs. We ought therefore, in making an examination, to place the ear over the infra clavicular region, (the skin being only covered by a piece of writing-paper,) and on the patient breathing quickly, as after running, the natural sound, or respiratory murmur, will be found diminished, and in some places, perhaps, entirely absent. The same examination ought to be repeated between the scapulæ, and we ought not to rest sa-

tisfied with trying one spot only; for it not unfrequently happens that the morbid deposit is restricted to a very small extent of pulmonary tissue, and by overlooking this, we may be often seriously misled. "When we find the respiration is not to be distinguished in any particular point, we may safely conclude the corresponding portion of the lungs within is become impermeable to the air from some cause or other."* It must not, however, be forgotten, during the anxiety of examination, that the respiratory murmur may be absent without the presence of tubercles. First, the air may be prevented from entering the pulmonary cells of a portion of the lung, in consequence of the stoppage of a large bronchial tube by viscid secretion. This will, however, soon be detected, as such a cause will not remain long, and may, indeed, be often immediately removed by coughing. Again, percussion (which will be noticed after auscultation), will yield a clear sound in this case; whereas, in tubercles, it would be dull. This difficulty is therefore easily overcome. Secondly, the air cells may be filled up with secretion, so as to prevent the

* Laennec by Forbes, p. 31.

admission of air. This may be detected by repeated examinations, as the secretion will be discharged, and thus the inference deduced from our former investigation will be rendered more correct. Thirdly, the lungs may be removed from the walls of the chest by the interposition of liquid or gaseous matters, and thus the respiratory murmur will become inaudible. We cannot, however, fail to detect the presence of these causes, and as we have no further difficulties to overcome, I think it will be readily granted that auscultation enables us to decide on the existence of tuberculous matter, when deposited to an extent sufficient to obstruct the circulation of the air in any considerable portion of the lung. I need not state that as pneumonia commences almost invariably in the inferior lobes of the lungs, and phthisis in the superior, these two diseases cannot be readily confounded.*

* According to the recent researches of M. Fournet, in the hospitals of Paris, the respiratory murmur (consisting of the inspiratory and expiratory murmurs) undergoes the following modifications in the first stage of phthisis :—

1. *Inspiratory murmur.*—Increased intensity of this murmur, which increase is exactly proportioned to the physical alteration of the lung.

Diminished duration of this murmur, which takes place at the same time as the increased intensity of it.

The character of this murmur, with respect to softness, dryness, and hu-

AUSCULTATORY INDICATIONS OF ULCERATION IN THE LUNGS AFFORDED BY THE CIRCULATION OF THE AIR. — In my opinion, auscultation does not enable us to say when a tubercle has begun to suppurate, nor that suppuration has taken place, until such time as a communication is formed between

midity, also undergoes a change. In the first period of the disease the inspiratory murmur is dry, rough, and, as it were, of difficult production. If we auscult the anterior part of the chest from below upwards, in a patient at the commencement of phthisis in the apex of the lung, we cannot fail to be struck at the successive transition from the soft, easy, mellow character of the inspiratory murmur to the characters of roughness and dryness which it presents as we ascend—a change which becomes still more perceptible according as the tubercular infiltration increases.

2. *Expiratory murmur.* — This, the second part of the respiratory murmur, invariably presents, in the first stage of phthisis, an increase both in its intensity and duration. This increase is constant and regular. The characters of roughness, difficulty, and dryness, are as observable in the expiratory as in the inspiratory murmur. The alterations in the *timbre* of these murmurs, M. Fournet considers to be very important in establishing the diagnosis of the first stage of phthisis. They consist at first of a souffle a little *clearer* than the natural souffle of inspiration or expiration; they then pass on to the *resonant*, *blowing*, and *bronchial* timbre. The bronchial timbre admits of a *first*, *second*, and *third degree*; it then becomes *cavernous* or *amphoric*, according to the extent of the cavity. These changes, having arrived at the bronchial character, still belong to the first stage of phthisis; but beyond this, they appertain to the subsequent stages. Even though the cavernous and amphoric characters may be absent, we must not necessarily conclude the non-existence of cavities.

These modifications in the *timbre* of the respiratory murmurs are in the first instance heard during inspiration, not affecting the expiration till a much later period. For further information on this subject, I beg leave to refer to M. Fournet's work.

the abscess and a bronchial tube. Laennec and most of his followers give us the "signs of the softening of tubercles," but experience compels me to adhere to what I have just stated. Perhaps it may be want of tact on my part; but, if such be the case, I am afraid that, after several years' daily experience without acquiring it, I shall never do so. But when a cavity is formed in the lungs, and communicates with the air-passages, we can readily detect it on applying the ear over the part so affected. Under such circumstances, cavernous respiration, gurgling, or metallic tinkling, will be heard, according to the condition of the part.

Cavernous respiration resembles that which is called bronchial, and is produced by the air rushing into an empty cavity. It may be distinguished from the bronchial respiration, by considering the position of the larger air-tubes, which confine it to the anterior and lateral parts of the neck, unless in very thin persons, where it may be heard towards the superior part of the sternum, and immediately under the clavicles.

Gurgling, or the Râle Caverneux of Laennec.— When there is pus or fluid in a cavity, respiration

produces a gurgling sound, if the cavity communicate with a bronchus. The gurgling is the consequence of the air passing through the liquid, and may readily be distinguished from the moist bronchial rhonchus by being more circumscribed, as well as by differing considerably in the character of the sound, which practice will readily enable the examiner to discriminate.

Metallic Tinkling.—This is an indication of some importance, and resembles the sound emitted on striking an empty glass with a pin. It is best heard when the patient coughs—but indicates alike the presence of fluid in the thorax, and very liquid pus in a tuberculous cavity. It depends on the *resonance* of the air agitated by respiration, coughing, or the voice at the surface of a liquid, which, together with this air, forms the contents of a morbid excavation.

From what has been stated, I think it will readily be granted that the science of auscultation, even as regards the circulation of the air in respiration, is of superlative value in forming a diagnosis. We shall next consider what information may be derived by auscultation of the voice.

On applying the ear over the larynx or trachea while the patient speaks, the articulation will be heard almost as distinctly as when we listen near the mouth of the individual. But if we apply the ear over the chest of a person whose lungs are healthy, the sound detected, while he speaks, will be very slight, and the words articulated perfectly inaudible—the loose texture of the pulmonary tissue, rarefied, moreover, by the intermixture of air, rendering the lungs bad conductors of sound. But where there is a cavity of considerable size in the lungs, with firm walls, containing air, and communicating with the bronchi, then, by placing the ear over it while the patient speaks, we can hear the words articulated almost as distinctly as by listening over the trachea. This is termed "pectoriloquy."* Here, again, we have another indication of a cavity; but, from the remarks already offered, it will readily be perceived that one may exist, and pectoriloquy be absent, certain conditions, as above specified, being necessary to establish this indication of such an excavation. These are—complete emptiness of the cavity, in-

* From pectus, "the chest," and loquor, "to speak."

creased density of its parietes, free communication with one or more bronchial tubes of a certain calibre, and proximity to the walls of the chest.

We must keep in mind that, as Laennec observes, pectoriloquism may be caused by other circumstances—viz., 1, by the decomposition of a gangrenous eschar ; 2, by an abscess, the consequence of peripneumony ; 3, by the circumstance of a cyst emptying itself into the bronchi, and probably, also, by a fistulous communication between the bronchi and an abscess in the mediastinum. Again ; pectoriloquy disappears when the excavation opens into the pleura, particularly if the opening is large and direct, and when its contents escape through the walls of the chest into the cellular membrane outside. It may also be temporarily suspended, should the contents of the excavation obstruct its communication with the bronchi. All these collateral circumstances must meet with full consideration, and, such being attended to, our inferences will be correct.

Auscultation of the Cough. — When the lungs are healthy, coughing produces no parti-

cular sound within the chest; but when there is a cavity in the lung communicating with the bronchi, the cough sounds as it does in the larynx, only more circumscribed; and if the cavity contains much fluid matter, the cough will produce a gurgling, even more distinct than that produced, under similar circumstances, by simple respiration. Dr. Spillan says that, in cavities where the tuberculous matter is only beginning to soften, and in the incipient abscess of pneumonia, coughing will often occasion very perceptible gurgling, when simple respiration will fail to excite it. But, I would ask, do we not always find, on opening an abscess in the lungs of a subject, or at a post-mortem examination, that it is so full of pus as totally to prevent the fluctuation or gurgling? Suppose we fill a bottle with water, and cork it—would the water gurgle on shaking the bottle? No; neither will the pus, till such time as it has partially escaped by an opening. I once witnessed a rather laughable illustration of this fact:—While making some purchases in a shop in Holborn, a man entered, and asked for a bottle of Warren's

Blacking. The request was complied with, and, to test the contents as to quantity, he immediately shook the bottle. On hearing a gurgling, he directly pronounced that it was not full. A second, third, and fourth, were presented to him, with no better result. At length, the attendant brought him an empty bottle, corked and sealed, on shaking which he declared himself fully satisfied, paid his cash, and walked off contentedly.

From what has been stated relative to auscultation, I think every candid reasoner will readily grant that this means of forming a diagnosis is preferable to all others where pulmonary consumption is suspected to exist; nevertheless it must not be employed to the exclusion of the outward symptoms, as both combined enable us to arrive at the truth with a certainty, unknown till Laennec established this practice. Before concluding these observations on auscultation it may be observed that this great man recommended a circular piece of wood, about eight inches long, to be applied to the chest by one end, and the other placed to the ear of the physician during the examination, he considering that the pectoral sounds,

on traversing this dense body, were rendered more audible. To this instrument he applied the term "stethoscope." *

Auscultation.—This branch of practice seems likely to undergo some modification, at least in theory, since the opinions of Dr. Skoda, of Vienna, have been published. There is a very important and well-known law in nature, that sound passes more distinctly through solid than through light bodies; but it is necessary to remember that this is only the case so long as the sound is confined to the medium in which it is formed, for it passes with difficulty from one medium to another; and it is on this law that Dr. Skoda's modifications in the views of auscultation are chiefly founded. For example, the least noise, as the ticking of a watch, is heard from one end of a table to the other, when the ear is placed upon the table, at the edge of it, so that no space intervenes between the table and the ear; the sound is now through one medium uninterruptedly; but if the ear be placed but half an inch from the table, no sound at all is heard, it is interrupted by the lighter medium of atmospheric

* From στῆθος, "the chest," and σκοπεω, "to explore."

air. And again; if a person be under water, he can hear sound from a considerable distance, if that sound be produced in the water; but if produced in the atmosphere above him, he will hear no sound at all, and vice versâ. All this applies with strictness to auscultation. For example: in pneumonia the voice is at one time distinct and at another indistinct; while percussion shews that no particular change has taken place in the lungs themselves, with respect to density. The change must exist in some other way—in some way which interrupts the passage of sound,—and this is from the obstruction of fluid matter of the bronchial tubes of the hepatized portion of the lung. But this is not the generally-received explanation, as it has been usually considered unimportant to the conducting of the vocal sounds, whether the air-tubes are filled with air or not. In effusion, resulting from pleurisy, the sounds of the voice diminish in intensity as the liquid increases, which ought not to be the case if the sounds, according to the usual explanation, increase according to the density of different media. The common theory, therefore, requires the modification which is given

by Dr. Skoda. The sound of the voice has to pass from one medium of a light nature to one of a denser, and consequently becomes imperfect, and almost totally interrupted. It must likewise suffer some degree of reflection, as all sounds do, when passing from a light to a dense medium. We know that sound only passes well through a hollow tube so long as that tube is hollow and without foreign bodies within it. Introduce a piece of cork, so as to plug up the cylinder in a speaking tube, which passes, in many shops, from one room to another, and the voice would be heard very indistinctly, if at all, and then only through the solid parieties of the tube. This shews that the sound of the voice is not conveyed through the solid parts of the trachea and lungs, as is generally supposed, but through the air in the hollow tubes of the trachea and bronchi. We know that the voice is heard more distinctly in those parts of the tracheal and bronchial tubes which are cartilaginous; and as the bronchial tubes lose their cartilaginous structure, the sounds become more indistinct. This is explained by what Dr. Skoda calls the law of consonance. For the perfection of the sound, it seem

necessary that the tubes should be perfectly hollow, and without any foreign body in their cylinders, and at the same time in their structure, or enveloped by dense substance externally. When this is the case, the voice is almost as loud in such situations as in the larynx itself, and must consequently impart a louder impression to the ear outside the chest. It seems, therefore, that the commonly received opinion on this subject is erroneous; it seems that the vocal sound is propagated, not through the different structures which intervene between the larynx and the chest, but through the different hollow tubes, and, of course, it is louder when the walls of those tubes are dense than when light.

Many practised auscultators prefer employing the naked ear to the wooden cylinder. Some persons may, no doubt, find their advantages in this, but as a general rule, the stethoscope is to be preferred. Numberless objections have been urged against applying the ear alone, some being referred to female delicacy, some to the want of cleanliness in patients treated in hospitals—all of which are so obviously unworthy of notice, that in reality,

the employment of the instrument or of the naked ear is purely a matter of taste. During an examination, whether to the assisted or unassisted ear, the chest ought to be uncovered, unless that a piece of writing-paper should be placed over the part where the ear is to be applied. This is advisable for many reasons, and if from this the sound is at all affected, it will be that of being rendered more distinct. During the process of auscultation, a finger had better be placed on the meatus of the unemployed ear, which has the effect of excluding any external sound, and of rendering that from the lungs much more audible.

Percussion.—If we half fill a barrel with liquid, and strike it over the part where the fluid is contained, the sound emitted will be dull, and the same as that returned on striking any solid; but if we strike the empty portion of the barrel, a clear sound will be the result. This is a fact so very familiar to every person that it only requires to be noticed. The lungs of a healthy person being filled with air, when we strike or percuss the chest, a clear sound will be emitted; but as the walls of this cavity differ in their construction in various

regions, so is the sound modified, in consequence of the interposition of the various media. If, however, the air is prevented from entering a portion of the lung, from any cause, then the sound, on percussing that part, will be dull, and similar to that returned on percussing the portion of the barrel which contained fluid. This fact was first applied to the detection of disease by Avenbrugger, who, in 1761, published an interesting essay * on the subject, and which ought to occupy a place in the library of every medical practitioner. Although in the early part of the first stage of phthisis percussion will afford no more satisfactory result than auscultation, and although, as a means of detecting disease, it is certainly much inferior to the latter method, nevertheless it is found to afford satisfactory confirmation in many instances. In acquiring the art of percussion, the first task is to learn the healthy sounds in all the different thoracic regions, on both sides of the chest, and in every variety of habit. This being accomplished, any marked alteration must indicate some deviation

* Avenbrugger, "Inventum novum ex percussione thoracis humani ut signo abstrusos interni pectoris morbos detegendi."

from the healthy condition. Where tubercles are deposited to an extent sufficient to obliterate the air cells, thereby excluding the air, the sound emitted on percussion will be dull. But we must keep in mind that this may proceed from other causes than the presence of tubercles, such as hepatization, pulmonary apoplexy, œdema, foreign growths compressing the pulmonary tissue, effusions into the pleura, hypertrophy of the heart, aneurysms of the aorta, &c.* Auscultation will, however, in a great measure, enable the physician to overcome all these difficulties; and when we call to our assistance the external symptoms, together with the history of the case, little doubt will remain as to its real nature. The art of percussion is not to be learned in a day, in fact it actually requires more practice than its coadjutor, auscultation; and he who desires to obtain the benefits resulting from such a method, ought to study the work of the father of this science, a translation of

* I am indebted to my intelligent friend, W. H. Hodding, Esq., 67, Gloucester Place, for the inspection of a new and very ingenious percussing instrument, invented and presented to him by Dr. Harwood, St. Leonard's on Sea. It has several very important advantages, and I can with pleasure recommend it to the attention of the profession. Mr. Waugh, 177, Regent Street, sells it.

which will be found as given by Dr. Forbes, in his work on the Stethoscope and Percussion. Avenbrugger was a diligent, candid, and discerning observer. He says, in his preface to this work, "Scripsi illa, quæ sensuum testimonio inter labores et tædia iterum iterumque expertus sum: neque in his unquam concessi locum seductrici philautiæ."

To conclude the subject of diagnosis, we shall just point out the method to be adopted in summing up the evidence afforded by the combined external and acoustic indications, so as to form a correct judgment. In a disease so obscure as pulmonary consumption is, in its first stage, the various testimonies obtained from the sources above mentioned must be duly weighed and considered, and in order to assign to them their just value, they must be compared and combined. This, I believe, will be readily granted by every candid practitioner who has had opportunities of investigating pulmonary disease; and he who professes anything to the contrary, must excite contempt among the well-informed members of the profession.

The following system of examination is that which I adopt, and one, I believe, that will, if pro-

perly conducted by an experienced observer, ultimately furnish us with all the facts necessary to arriving at as correct an inference as can be attained in the present state of the science of diagnosis.

EXAMINATION INTO EXTERNAL SYMPTOMS.

1st. Review the expression of countenance and the temperament of the patient, while he is giving his own account of the disease.

2nd. Inquire into the origin, duration, and the effects of the complaint on the constitution.

3rd. Find out the state of constitution prior to the disease coming on, and the idiosyncrasies which may render any organ particularly susceptible of disease.

4th. Inquire into the hereditary complaints, if any, to which the patient may be subject.

5th. Learn the habits of the individual.

6th. Ascertain the state of pulse unaffected by exercise or emotion, also the seat of pain, if any.

7th. Discover the nature of the cough, quantity, and quality of expectoration, and whether or not hæmoptysis exists or has ever existed.

8th. Examine the respiratory movements after rest, and find out how they are affected by slight exercise.

9th. Inquire after the condition of the stomach and bowels, and whether or not the patient is liable to hectic fever or perspirations.

EXAMINATION INTO ACOUSTIC SIGNS.

Percussion.—Find whether the sounds returned on percussing are natural, or more dull than in health, and be particular in comparing the sound as yielded by corresponding portions of the chest on either side.

Auscultation.—1st. Ascertain whether or not the respiration is natural, and the lungs throughout permeable to air, or if there is obstruction in any part, and if the latter should be the case, try the effect of percussion over that part.

2nd. Listen for cavernous respiration, gurgling, or metallic tinkling.

3rd. Endeavour to detect metallic tinkling while the patient speaks, at the same time listen for pectoriloquy.

4th. Try the effect of coughing, and observe whether or not it produces a circumscribed tracheal cough, or gurgling.

Having gone through this examination, should we meet with a combination of the more suspicious external indications, and find, from percussion and auscultation, that there is obstruction to the air, cavernous respiration, gurgling, metallic tinkling, or pectoriloquy, and that these do not proceed from the occasional causes already adverted to, and which may be readily detected by the practised observer, we may then safely pronounce the unhappy judgment, that consumption is the disease.

By such a method of examination as has been laid down the practitioner is frequently able to detect the presence of tubercles in the lungs long before there is any external indication of this disease, and while the patient, as yet, suffers no bad effects from it.

CHAPTER IV.

PREVENTION OF CONSUMPTION.

Principiis obsta.

HAVING now fully developed the general pathology of tubercular phthisis, and pointed out the derangement of the system on which tubercular deposition depends, as also the various causes, both predisposing and exciting, which occasion such tubercular diathesis, we shall next proceed to explain the means, both hygienic and medicinal, by which we may be enabled to prevent the system from lapsing into that cachectic state which predisposes it to the invasion of the process of tuberculization. The prevention and cure of disease being the ultimate end and aim of all rational pathology, it was obviously necessary, before we attempted to lay down rules of therapeutics, to

discover the material character of the disease to be combated, the pathological condition of the affected organs, as well as of the system in general on which the disease depends; as, also, the causes which are most frequently observed to predispose to or excite it. Having executed these preliminary objects as fully as the vast importance of the subject seemed to require, the means calculated to prevent the occurrence of the tubercular condition of the system are almost sufficiently obvious, without any very special detail of them. We shall, therefore, be very brief in our chapter on the prevention of phthisis. For the prevention of this disease the following indications may be laid down:—

1st. To hinder the development, in children, of the original predisposition to the disease, by removing from the parents such causes as may be capable of inducing accidental phthisis, or of calling forth the development of hereditary phthisis.

2nd. To prevent the development of the acquired predisposition, by removing from the individual such unhealthy circumstances as may bring on this predisposition to phthisis.

3rd. When once this predisposition to phthisis, whether original or acquired, has become developed, to prevent the process of tuberculization from taking place and localizing itself in the lungs, by combating the disturbances of the function of nutrition, which, we have already shewn, occasion and keep up this process, at the same time that we must remove from the patient such local exciting causes, as may have the effect of determining this morbid movement to the pulmonary organs.

4th. When pulmonary phthisis is established, to prevent, by the adoption of the preceding means, the formation of new tubercles, and so to keep the disease within its first limits of development and severity.

5th. If possible, to make the disease retrograde, by endeavouring to cause the tubercles already formed to disappear, by some other means than that of softening.

Such are the indications to be fulfilled; such the direction to be given to the efforts of the practitioner, in endeavouring to prevent the occurrence of confirmed phthisis. As a means to enable him to fulfil these several important indica-

tions, the preceding parts of this work furnish him with a knowledge of the circumstances capable of developing the tubercular diathesis, and consequently enable him to shun them, and to place the individuals in whom the occurrence of phthisis is apprehended, in conditions adverse to its development. They also point out to him the causes capable of calling forth this predisposition into action, of exciting the process of tuberculization, and of localizing it in the lungs, and so enable him to prevent the action of these causes, or at least to combat them, and diminish their effects.

Such is the end to be attained, and such the indications to be fulfilled, in order to accomplish it. The means which therapeutics furnish us to attain it may be classed under two heads, hygienic and medicinal. It is scarcely necessary to say that the rules of treatment, whether preventive or curative, in order to be attended with success, must be deduced from the nature of the disease to be combated. Now, as we have already seen, pulmonary phthisis may be considered to consist of two great morbid elements. First,—The one which appears first, and which is indispensable to the development

of the other, is that particular state of the entire system, developed under the influence of causes which are almost always general, and which we have seen to consist in a peculiar alteration in the discriminating power of the mouths of the lacteals, whereby the function of nutrition becomes deteriorated, a result which lays the foundation for the general predisposition to tuberculous affections and the special predisposition to the pulmonary tuberculous affection. Secondly,—The other, which is a natural consequence of the first, and which, to all appearance, cannot be developed without the pre-existence of it, and which is most commonly determined by exciting causes, whose action is more especially directed to the respiratory system, consists in the deposition of inorganizable or tuberculous matter in the parenchyma of the lungs. Thus, then, in preventing the establishment of phthisis, two lines of treatment are necessary; the one, of a general character, which is directed to meet the primary cause of the disease, the alteration of nutrition in the organs, and the several influences capable of keeping it up and aggravating it: the other is local, and directed to combat the

effects of the presence of tubercles in the lungs, as also to oppose the local influences capable of favouring the development of new tubercles, or the progress of those already formed. We may in general lay it down that the local element of phthisis, and the causes which have produced it, and still keep it up, require more especially an asthenic line of treatment; while the general element, on the contrary, as also the causes which have given rise to it, and tend to perpetuate it, indicate a sthenic treatment.

Of these two, the general treatment is by far the more important, and is that which should more especially attract the attention of the practitioner, inasmuch as it is that which attacks the primary cause of the disease—a cause which is incessantly acting, and which tends not only to perpetuate, but also to aggravate it. Without it, in fact, the local treatment would be ineffectual.

We have already stated what the principal indications were for the prevention of phthisis, as also the means within our reach necessary for the accomplishment of these indications; we have also seen that these various elements of treatment all

converge to this one point—namely, to prevent the action of the causes, to diminish their influence when they have manifested themselves, and to combat their effects, both local and general, when they have taken place. We have also seen that the means for so doing were partly hygienic and partly medicinal. We shall now present to the reader a cursory view of these two classes of means.

Hygienic Means.—These means possess a decided advantage over the medicinal in many particulars; for besides being endowed with a preventive efficacy, they are capable of exercising a happy influence, even should the disease already be established. In fact, if the general tuberculous cachectic state is already developed, the preventive treatment is calculated to arrest the local element of phthisis; and if the first crop of tubercles has occurred in the lungs, it may prevent the development of new tubercles in these organs, either by attending to and removing the local causes which might excite it, or by combating the action and effects of the general causes which, by keeping up the cachectic state of the system, occasion an in-

cessant tendency to the deposition of tuberculous matter in the tissue of the lung. Under the hygienic means adapted to the prevention of phthisis, we shall first notice the necessity of paying strict attention to the *powerful influence of hereditary transmission.* All writers on pulmonary phthisis concur in the conviction of the great importance of the precept, that parents, as well for their own sakes, as for the sake of their children, should protect themselves from the influence of those antihygienic circumstances, capable of developing the tubercular predisposition. If they themselves have already received this predisposition at birth, it is of the highest importance that they should carefully avoid the causes which may favour it, so that they may either extinguish it in their own generation, or at least diminish it so far, as entirely to prevent its transmission to the succeeding generation. If these same precautions were adopted with children born of parents so predisposed, we might be well nigh certain of extinguishing in families, in the second or third generation, this hereditary taint, which, without such precautions, becomes increased at each new transmission, and soon causes the family

to become extinct, instead of the disease becoming extinct.

Certain matrimonial alliances are capable of exercising considerable influence on the health of the children resulting from them; for instance, it is well known that alliances contracted between members of the same family cause the resulting offspring to degenerate, the succeeding generations to become debilitated, and that they give a predisposition to certain diseases, especially those of a cachectic description, and eventually lead, after a certain time, to the physical degradation, and even to the total extinction, of families. Sir James Clarke* advises alliances in the same family to be sedulously avoided, as they prove to be fertile sources of scrofula, and lead to the deterioration both of the physical and mental powers. For a somewhat similar reason, marriages between parties, both labouring under chronic, incurable diseases, never fail to produce delicate and sickly children, who, when exposed to the slightest causes calculated to excite disease—causes which would exercise no influence on healthy children, are so often observed to become cachectic, scro-

* See his work on Consumption.

fulous, and consumptive. More mischievous still are marriages between individuals actually consumptive, or predisposed to become so.

The next hygienic mean I shall notice for the prevention of phthisis is, *strict attention to the functions of the uterus in the female.*

It is known to every practitioner, how frequently disturbances in menstruation throw the entire system into a state of exhaustion and debility, followed by a deterioration of the functions of nutrition, which, according to our pathological views, has such vast power in predisposing to tubercular cachexy and pulmonary phthisis. Hence the necessity of combating early such derangements, so as to prevent such a state of the system from being induced. True it is, that the derangements of menstruation observed in phthisical females are very frequently the effects, and not the cause, of phthisis; and that they are posterior and not antecedent to the development of this affection. However, there are some cases in which the derangement of the menses evidently precedes the first symptoms of phthisis.

The period of pregnancy requires on the part

of the future mother constant and judicious attention, less important, probably, to herself, than to the child she is carrying. All authors agree in saying, that all the influences acting on the mother during this important period, are capable of reacting on the constitution and future health of the child. To remove sedulously all morbid influences, as far as may be possible—to combat them when they have developed themselves—to surround the mother with all the hygienic attentions within reach, such should be the line of conduct to be adopted in all cases of pregnancy.

We shall next inculcate *attention to the diseases of the respiratory system*, as among the hygienic means for the prevention of phthisis.

It is the opinion of several distinguished pathologists, that the deposition of inorganizable matter in the lungs is generally determined by a local exciting cause, which consists most frequently in catarrh, or some inflammatory affection within the chest, which frequently surprises the patient placed under the influence of a tubercular predisposition, and attracts to and fixes on the lungs the process of tuberculization, as yet diffused through the en-

tire system. Hence the necessity of attentively watching in an individual suspected of a predisposition to phthisis, all morbid affections acting on the respiratory organs. The mischievous influence of pleurisies, pneumonias, catarrhs, &c., in calling forth the tubercular diathesis, is universally acknowledged. We all know the havoc committed on phthisical patients during the prevalence of the influenza of 1832 and 1833.

The next hygienic mean we shall notice, as available in preventing phthisis, is, *due attention to the diseases of the digestive and cutaneous apparatus, and to the more or less regular exercise* of the functions of these organs.

The close connexion between the digestive and nutritive functions, and the dependence of the tubercular diathesis on derangement of the latter function, are so obvious, and have been so much dwelt on in the preceding part of this work, as to obviate the necessity of dwelling more at length on that part of the subject. The acute exanthemata, especially small-pox and measles, are ordinarily accompanied by inflammatory phenomena, affecting the organs of respiration, and thus appear to exer-

cise considerable influence in calling forth pulmonary phthisis. This great influence of the exanthemata, and indeed of diseases of the skin in general, has been explained anatomically by the uninterrupted continuity of the cutaneous and mucous tissues. This close connexion should be constantly kept in view by the practitioner, in the treatment of the exanthems and of all skin affections. In order to keep up the free exercise of the cutaneous surface in the infant, we would recommend great attention to cleanliness, frequent baths, at first tepid, and then cool or even cold, according to circumstances, as also gentle friction over the surface of the body with dry flannel. The use of flannel next the skin is of the utmost importance in a climate such as ours, subject to such rapid and sudden changes, and that for persons of all ages.

We next would inculcate the necessity of attending to *the influence of air and solar light.*

The breathing of a tainted atmosphere, dwelling in a confined habitation, where the light of the sun can scarcely gain access, are, in my opinion, the most powerful causes of tuberculous cachexy and of pulmonary phthisis. So influential are these causes,

that I am satisfied if we were to employ in treating a phthisical patient, or in the case of one menaced with the disease, all the other means, hygienic and medicinal, we should never succeed in arresting the progress of phthisis, if we neglected to pay attention to the influence of insolation and respiration. It is unnecessary to dwell further on the necessity of attending to these two important points.

The *influence of habitation and of climate* with respect to the production of phthisis. Cold and moist dwellings, regions and climates where we are exposed to the consequences of sudden and irregular variations of temperature, exercise a most mischievous influence on the development and progress of phthisis. Hence will appear the necessity of paying particular attention to the selection of an appropriate dwelling for phthisical patients, or those threatened with phthisis. We shall conclude this part of our subject, by inculcating the necessity of paying attention to the influence of the seasons, and of the different states of the atmosphere* in the prevention of phthisis ; also

* I cannot allow this opportunity to pass by without alluding to Mr. Jeffrey's Respirator, an instrument invented by him for the highly-impor-

to the *influence of physical and intellectual exercise*, as also of *diet* and sleep; and shall reserve what we had to say, concerning the medicinal means to be adopted for its prevention, till we come to consider the curative or pharmacological treatment.

ant object of warming the air inhaled by those invalids to whom the respiration of cold air might be distressing or injurious. The experience of the medical profession has now fully established the great value of this instrument, both as a preventive and curative means. To persons who suffer from extreme irritability of the air-passages, and who are on that account obliged to remain confined to the house, when the temperature of the air sinks to a certain point, such an instrument as the respirator must prove a valuable boon.

CHAPTER V.

TREATMENT.

PART I.

ARRESTING PROGRESS OF CONSUMPTION.

ALTHOUGH confirmed pulmonary consumption is not necessarily an incurable disease, nevertheless as a cure can only be effected where suppuration has taken place in the lungs, and as the danger is then eminently great, it is always advisable to arrest the progress of this malady where practicable, and as early as possible. That phthisis may very often be arrested, where judicious measures are adopted sufficiently early, and the circumstances of the patient enable him to conform to the requisite mode of living, and to follow a suitable regimen, and to comply with other conditions necessary for such cases, there can be no doubt. There are hundreds of instances where the disease,

though obviously developed, has been arrested; and where the individuals have lived to an old age, and ultimately fallen victims to other maladies.

The objects of the physician who endeavours to arrest the progress of consumption when once established, are twofold. First, to prevent a future absorption of inorganizable matter; and secondly, to subdue the irritation and inflammation produced in the lungs, by that which is already deposited in them.

The means by which the first object is accomplished has already been described under the head of prevention, and consequently need not be repeated.

The second is that which now claims our consideration.

In order to treat and remove the irritation and consequent inflammatory action produced in the lungs and air passages by the presence of inorganizable matter, several circumstances demand consideration before adopting a single measure. In the first place, the extent to which tuberculous matter has been deposited must be ascertained; as also the portion of pulmonary tissue in which it is

imbedded. Having obtained this information, we shall be able, in some degree, to judge as to what extent it will be necessary to carry our treatment, and to decide with certainty to what part of the chest we must direct our remedies.

The nature of the inflammatory action must also receive full investigation—in some cases it is acute, and in others, chronic. As the treatment must differ according as the inflammation is acute or chronic, and as that mode of treatment which would prove effectual in relieving the one would often aggravate the other, this subject of inquiry must on no account be neglected.

The age, sex, and temperament of the patient must also be taken into account, as they often forbid some remedies that the disease would, under other circumstances, indicate. I shall therefore now advert to those means which experience has proved to be valuable, in overcoming the inflammation consequent on tubercles.

Counter-Irritants.—There are few remedies more effectual in removing inflammation than counter-irritants, and none that can with safety be more universally employed, caution being only re-

quired where much febrile excitement is present. They may be subdivided into five classes—namely, *rubefacients, blisters, pustular counter-irritants, setons, and issues.* In inflammation so obstinate as that produced and kept up by tubercles, a powerful counter-irritant is infinitely preferable to rubefacients, whose action is slight, and in consumption half-measures are useless. The good effects resulting from counter-irritation, when properly regulated, are often incredible, in many instances removing every symptom of consumption. I recollect one case of tubercular phthisis, where a young lady was the unfortunate sufferer, and who, as it were to consummate her miseries, was dreadfully scorched on the upper part of her body, through her dress accidentally taking fire. Here then was counter-irritation to an extreme; but what was the result? This lady was quickly relieved of her phthisical symptoms, and is now alive and well, never having had any return of her former distressing cough, or other attendants on tubercles in the lungs. She however, to this day, submits to prophylactic treatment, and were she to neglect it, I doubt not, would soon be as great a sufferer as

she was prior to the accident. Most people have heard of the late St. John Long, whose notoriety in treating consumption was gained solely by his having recourse to the effects of a powerful counter-irritant. Although he was severely handled, and much ridiculed by the profession, I hesitate not to say, that his treatment was good, so far as it went; but being ignorant of the principles of medicine, he could only avail himself of his private nostrum, so that his patients had but one chance of recovery. "Counter-irritation," says a high authority, "in the treatment of phthisis, has the testimony of almost every ancient and modern author in its favour. The theory of its action is far less important than the inquiry, as to whether experience has satisfactorily demonstrated its utility; all we can say is, that there are few subjects in therapeutics on which so little discordance of opinion has existed."*

I am fully convinced, that counter-irritation would be much more generally employed in the treatment of phthisis, and the good effects which ought to result from it very much more generally

* Louis on Phthisis, by Cowan, p. 370.

witnessed and appreciated, were it not that it requires to be regulated according to circumstances. The nature of the case must determine the counter-irritant to be used—the tuberculated portion of the lung must point out the part to be counter-irritated; and the obstinacy and degree of irritation and inflammation which may exist must determine the extent to which it must be carried. It is not therefore indiscriminate counter-irritation that is useful, but regulated counter-irritation. I have known phthisical patients blistered again and again, without a shadow of benefit, and afterwards I have relieved them of every symptom of their disease, with little more than regulated counter-irritation. A case of this sort came under my observation only a few months ago: a person labouring under tubercular phthisis, had been alternately under the care, I believe, of all the professional men in a provincial town, and treated without obtaining any benefit. He consulted me; when I saw it advisable to have recourse to counter-irritation. He immediately objected to this part of the treatment I was adopting, on the ground that it had been perfectly useless in all prior attempts. Adhering to my own

plan, I succeeded in effectually relieving him ; and with one-half the amount of counter-irritation to which he had formerly submitted. He is now returned to his business, and he writes me that, by attending to the general rules I had laid down for his guidance, he continues in perfect health.

Counter-irritation I consider almost an art of itself, and I could illustrate very many instances of cure, not in phthisical practice only, but in medical and surgical practice generally, where it has proved effectual in some hands, while it was even worse than useless in others.

In order to illustrate this, I might advert to a case that came under my notice some eight years ago. A Mrs. N., then residing in B., called on me for professional advice, and on inquiring into the cause of her lameness, I was told that it resulted from a sprain in the ancle joint, which took place three years previously. During this time she had consulted several medical men, some of whom blistered her ancle once or twice, others used cold lotions,—some one thing, some another. She now, and very naturally, abandoned all hope of recovery. In four weeks from the day she first called on me,

I had her sound, and able to walk without crutches, or even the support of a stick, and by regulated counter-irritation alone. She never had any return of her lameness.

I might dilate on the good effects of regulated counter-irritation, and illustrate not only the inutility, but injurious results from indiscriminate practice of this sort, were it not foreign to the purpose of this treatise.

I may observe here, that in some cases of phthisis, concentrated acetum lyttæ is a very useful counter-irritant. It ought to be applied with a paint-brush about the size of the finger, and where the skin is at all coarse it requires to be well rubbed in.

Country practitioners will also find that they possess a ready, effectual, and very useful counter-irritant in the urtica dioica, or common nettle. I have often used it in the absence of other irritants, and am disposed to think that it might be very often usefully employed.

Where it is deemed advisable to promote a purulent cutaneous discharge, SETONS, or ISSUES, may be beneficially employed. The discharge produced

in this way is often of great advantage, soon affecting the system, and in some constitutions ought not to be overlooked. Mudge speaks very flatteringly of their effects, observing that he "can venture to say, from long experience, that, accompanied with change of air, and occasional bleedings, the patient will find his greatest security in a drain from a large scapulary issue." Although they are very useful, nevertheless, like every other remedy, they are inadmissible in some cases; for in spare, irritable invalids, they are much more injurious than beneficial, and in phthisis I would never use them, unless the patient is as yet gross and plethoric.

But while external applications are being employed, those medicines which prove so valuable when administered internally, must not be neglected. They are prescribed with the view of subduing the irritation and inflammation consequent on tubercles, to suppress any troublesome symptom that may present itself, and to bring and keep the system as near the healthy condition as possible.

With this view I have very generally employed,

and that with the greatest success, the muriate of morphia in solution, combined with the tincture of digitalis and antimonial wine, to which may be added the syrup of squills. Of course, circumstances may in some cases forbid the use of antimony, such as irritability of the stomach and bowels; but where it is admissible, I consider it a valuable remedy. The morphia must also be administered with caution, and its effects on the bowels watched and counteracted. Although digitalis is not now so much appreciated in the treatment of phthisis as at one time, nevertheless, it is a most valuable medicine in such cases, but ought never to be prescribed unless where the medical attendant can see the patient daily.

Where the above medicine does not produce the desired effect, I would invariably, unless any symptom contraindicated, have recourse to

Emetics.—It would, perhaps, be impossible to find any class of medicines throughout the whole range of the Materia Medica, the effects of which are so decidedly beneficial in removing inflammation from the air passages, as are emetics. For the last eight years I have had constant opportunities

of proving their good effects; and the concurring testimony of many of our first physicians bears me out in recommending them. Drs. Morton,* Simmons,† Parr,‡ Robinson,§ Reid,‖ Marryat,¶ Laennec,** and a host of others, refer to their utility in terms so strong, that it seems surprising how they have fallen into disuse in such cases. Laennec says, "In the case of an old lady of eighty-five, who had laboured under a chronic catarrh for eighteen months, with an expectoration amounting to two pounds daily, I prescribed fifteen emetics in one month, and with complete success, as the patient lived eight years afterwards free from the complaint." And Dr. Young observes, that "it is remarkable that a very great majority of the cures of consumption, which are related by different authors, have either been performed by emetics, or by decidedly nauseating remedies."††

* Illustrations of Pulmonary Consumption, by J. D. Morton, M.D.

† Practical Observations on the Treatment of Consumption.

‡ London Medical Dictionary; article—Emetics.

§ Observations on the Virtues and Operations of Medicines.

‖ Essay on the Nature and Cure of Phthisis Pulmonalis.

¶ Therapeutics; or, the Art of Healing.

** A Treatise on Diseases of the Chest, translated by Forbes.

†† Practical and Historical Treatise on Consumptive Diseases.

The evidence in favour of emetics in catarrhal inflammation, or that which is consequent on tubercles in the lungs, is so strong, as in my opinion to render the neglect of them culpable, unless in cases where their use is contraindicated. Wherever there exists irritation of the stomach or intestines, they are on no account to be employed; as they aggravate such a state in a frightful degree. I prefer the tartrate of antimony, which ought to be prescribed in doses sufficient to produce free vomition, and repeated every second morning, till the disease subsides, or the case proves itself beyond their power. I have administered eleven emetics before a symptom of relief was apparent, and by continued perseverance in their use have ultimately effected a removal of the inflammation. I cannot too strongly guard the practitioner against losing hope of their utility, because for a considerable time they may seem useless; for here, perseverance affords the only chance of success.

Although antimony is the preferable medicine for use in such cases, as an emetic, nevertheless, many of our most intelligent physicians have preferred others. Morton made choice of squills;

Marryat gave antimony combined with ipecacuan, and when it induced severe diarrhœa, he then changed it to four grains of ipecacuan, and one grain of sulphate of copper. Reid administered ipecacuan alone, while Simmons considered sulphate of copper superior to any other.

I have seldom seen occasion to change the antimonial emetic, and where the patient is troubled with bile, it promotes its discharge. After emetics have been discontinued, it is advisable to administer tonic medicines, whereby the stomach may be brought to act freely, and recover its tone, so apt to be destroyed by these remedies.

Inhalation of volatilized substances is often of signal advantage, and may be combined with other means. They are used for two opposite purposes: First, to allay acute inflammation in the lungs and air passages, in which case a sedative must of course be used. I have found none more useful under such circumstances than the preparations of opium, combined with warm water, and inhaled through an instrument such as Mudge's or Scudamore's Inhaler. The process of inhalation ought to last for five minutes each time, and be repeated

every fourth hour, care being taken by the patient not to become exposed to a cold atmosphere after the inhalation. Secondly.—When there exists an obstinate chronic inflammation in the lungs or air passages, gentle stimulants ought to be inhaled, so as to excite fresh action in the parts. Tar, so strongly recommended by Sir Alexander Crichton, is in such cases not unfrequently extremely beneficial. It may be best administered by heating the tar in a vessel over a spirit lamp, a small proportion of subcarbonate of potass being previously added, to neutralize any pyroligneous acid which the tar may contain. The heat from the lamp ought to be moderate, and the vapour diffused in a chamber to which the patient may frequently repair, and adjoining the room he may generally occupy, care being taken to keep both apartments at an equal temperature. When it can possibly be avoided, the tar ought never to be volatilized in the bedroom of the patient, as it adheres to the furniture, and when it becomes offensive to the patient, he cannot avoid the nuisance; in addition to which, by living constantly amongst it, the effect soon becomes lost. Dr. Morton, of Phila-

delphia, speaks very favourably of its efficacy. He says, "after a fair trial with various substances, there is no one which I have prescribed in this form with equal success to tar, in combination with subcarbonate of potash, in the manner recommended by Sir Alexander Crichton. In truth, I have seen it act like a charm."*

Chlorine has a similar effect, but from the results of experience, I would, generally speaking, give tar the preference. M. Gannal, a French manufacturer, directed attention to the effects of chlorine, having observed that consumptive persons experienced relief when breathing an atmosphere charged with the chlorine disengaged in the manufacture of printed cottons. When tar fails, and this medicine is to be employed, seven drops of it may be added to a pint of warm water in an inhaler, the vapour of which ought to be inhaled for five minutes at a time, and repeated every fourth hour. It will, however, be necessary to increase gradually the quantity of chlorine, from seven up to forty or fifty drops.

Various other medicines have been recommended

* Op. cit.

and used for inhalation, among which iodine has held a conspicuous place. I believe that, in cases of chronic inflammatory action in the air passages, iodine is useful, when judiciously administered, but it certainly possesses no power over this morbid condition, unless what its stimulating properties induce : it has consequently no particular claim on medical attention. Dr. Stokes, in treating of consumption, offers the following remarks on this medicine :—"I have not, in the text, alluded to iodine," says he, "because I believe that as yet no case has been made out in favour of its exhibition. That its employment is generally adopted on the grounds of false analogy, and in ignorance of the pathology and pathological anatomy of tubercle, cannot be denied, and the consequence is what we might expect, that it is the favourite remedy of the harpies of medicine."*

Those who advocate the use of iodine in pulmonary phthisis ought to specify against what symptom they employ it, and the principle on which it acts. It is absurd to say that a medicine is useful in consumption, without specifying in what way.

* Dr. Stokes on Diseases of the Chest, p. 453.

The physiological pathologist naturally inquires what morbid condition it will relieve. No one will, surely, venture to assert that it can dispel tubercles from the lungs. Such being the case, if it is at all useful, it must be so merely in relieving some symptom. I have often tested its effects in the form of vapour, and would never again venture to use it in phthisis, unless where there is chronic inflammation in the mucous membrane of the air passages, and then I think it may be occasionally employed with advantage.

Whatever method we adopt to remove the inflammatory action produced by tubercles, the regulation of the bowels must not escape observation. This is a *sine qua non* in phthisical practice. Much difference of opinion has existed relative to the propriety of administering purgative medicines in the first stage of consumption. Some there are, who, placing great faith in their effects, prescribe them, without taking into consideration whether the circumstances of the case demand them, or even without reflecting whether they will not prove directly injurious. Others, again, timidly abstain from prescribing them, in dread of diarrhœa oc-

curring, and the consequence is, that the alimentary canal often becomes loaded with irritating matter, the intestinal secretions become deranged, the disease in the lungs is aggravated, and hectic fever and other attendants on phthisis manifest themselves. He who administers purgatives too freely, and he who declines their aid entirely, are equally in error. They ought to be used, not "occasionally," but when circumstances demand, and then cautiously, but not timidly. The pathology of consumption proves how directly deranged action in the stomach and bowels is connected alike with the production of consumption, and with keeping it up after it is established. We ought, therefore, most certainly ever to be watchful that the digestive functions and alvine secretions are natural. Where there is clear evidence, from the regularity of the stools, and the nature of the evacuations, that the state of the bowels is healthy, then on no account ought we to provoke a deviation, by administering that which is uncalled-for. If, however, constipation do exist, or if the functions of the liver are languid, then such must be corrected. Superficial inquiry will not, however, suffice to

prove that a purgative may not be called for; neither is implicit reliance to be placed on the evidence of any nurse; and the physician who has his patient's health at heart must therefore not be above personally examining the nature of the evacuations. Dr. Hamilton might well say, "I have learned that a knowledge how to regulate the alvine evacuations constitutes much of the prophylactic part of medicine; and hence, how necessary it is to advise those who either wish to preserve good health, or who are in quest of the lost treasure, to attend to this circumstance."* Calomel, rhubarb, magnesia, sulphate of magnesia, and enemata, may be employed, the choice being determined by the nature of the case. There is no danger of establishing an unmanageable diarrhœa in the first stage of consumption, and when diarrhœa is found in a patient, with merely tuberculated lungs, it generally proceeds from vitiated secretions, or an overloaded state of the alimentary canal, producing irritation of the mucous lining of the intestines. In such cases it generally intermits,

* Dr. Hamilton, on Purgative Medicines, p. 7.

ceasing for a few days or weeks, and again making its appearance.

Blood-letting.—In the first stage of consumption the patient will generally derive immediate and marked benefit from the loss of blood. The inflammation which may exist in the organs of respiration is thereby generally much subdued, and the hectic fever reduced, so that the patient, in place of being debilitated by the loss of blood, will, on the contrary, find his strength increase. Blood-letting, however, must not be had recourse to indiscriminately, and without reflecting whether or not any circumstance contra-indicates its use. With this, as with every other remedy, discernment is required, to determine in what cases it will prove serviceable, the extent to which it must be carried, its repetition, &c. Where such discernment is not possessed, or where, if possessed, is not used, the very best of means may be rendered the most injurious. There is a point to which practice must be carried to be useful, and one where we must stop to prevent mischief; and these points can only be recognised by the practitioner who is thoroughly acquainted with the structure and functions of the human

frame in health, and their modifications in disease. But now that our medical schools are adopting measures to teach the godlike art of preserving and restoring health, on solid principles, by laying a useful foundation of anatomical knowledge, I believe that in time there will not exist such medical men as merely steer round the shore of disease, while others, by superior information, can venture into the ocean and make wider efforts, because they can work a traverse.

In attempting to arrest consumption, after we have overcome the morbid condition which leads to absorption of inorganizable matter, we have then little more to do, or at least, that we can do, than subdue the irritation and inflammation produced in the lungs by the tubercular matter. And as Dr. Hastings observes, "pulmonary inflammations, above all other maladies, are relieved by this powerful remedy" (blood-letting.)*

Experience has clearly shewn, that small depletions, often repeated, are preferable to large. In treating an adult in the first stage of phthisis, I

* Dr. C. Hastings, on Inflammation of the Mucous Membrane of the Lungs, p. 298.

generally order about six ounces of blood to be taken away at a time, and repeated at intervals, determined by the state of the patient; frequently recurring to it at intervals, averaging from five to ten days, and often continuing this practice for one or two months. So great, indeed, is the relief derived from venesection, that some practitioners, particularly Douar, who first recommended it in Britain in phthisical cases, have carried it to an excess subversive of the object with which it was employed, destroying the general health of the patient, and his chances of recovery.

Although local depletion has been recommended, I have never found it so useful as general; and the application of leeches, or the cupping instrument, often interferes with counter-irritants.

In addition to treating the irritation and consequent inflammation produced by tubercles, other symptoms often present themselves, and demand immediate attention. The practitioner, therefore, who undertakes the great responsibility of treating phthisis, must ever be on his guard, watchful, eager, and prompt. He cannot lay down any rule

of practice as a guide, but must be governed by circumstances.

Hæmoptysis, for instance, is a very frequent attendant on consumption, so much so, as to have been at one time, before the pathology of tubercular phthisis was understood, very generally looked on as a cause of consumption. Hæmoptysis, as I have already stated in a former chapter, is invariably either the consequence of congestion in the lungs, or of lesion in some portion of the pulmonary tissue. Any circumstance, therefore, which will induce either of these conditions, has a tendency to induce spitting of blood; and the congestion often resulting from the irritation of tubercles consequently accounts for its presence in consumption. It may, however, and often does, precede tubercular deposition, for the very inflammatory attacks that develop the tubercles in the lungs in so many instances, will not unfrequently produce spitting of blood before tubercles are formed. "Malformation of the thorax," says Dr. Robert Law, "by compressing the lungs, and thus interfering with the free exercise of their functions,

often causes hæmoptysis."* Such malformation first produces congestion, which has already been seen to manifest itself very frequently in this way. Languid action of the heart, suppressed discharges, whether natural or diseased, general plethora, &c., may all produce hæmoptysis in constitutions where the seeds of consumption are not absorbed, and where there consequently exists an impossibility for consumption taking place. Ovid says, that the Romans were well aware of the true nature of hæmoptysis—an assertion admitting of question; and Plautus informs us, that they treated it with resin and honey.

When hæmoptysis is found attending consumption, we ought to use means whereby it may be stopped, for by neglecting it, the patient's strength is often greatly reduced; and I am disposed to believe that it also accelerates suppuration. In such cases, venesection is of signal benefit, but not unless carried to an extent sufficient to relieve congestion when it proceeds from this cause. The late Dr. Cheyne, of Dublin, fully appreciated the value of venesection in these cases, and in

* Cyclopædia of Medicine, vol. ii. p. 402.

one of his papers relative to this subject, he observes, "that bleedings may be practised with safety, and often, if I mistake not, with more advantage than any other remedy in use."*

In addition to venesection, much benefit will result from the use of astringent medicines. Sulphate of alum, or sulphuric acid, I consider equally serviceable. Muriate of soda has been highly recommended in such cases, and those medicines which restrain the action of the heart will, by subduing the impulse with which the blood is thrown into the lungs, prove valuable and worthy of trust. But before prescribing any medicine, we must consider whether or not the case will admit of it. We have already seen that languid action of the heart is sometimes a cause of hæmoptysis, and were we in such cases to prescribe medicines which would increase this want of action, it is very obvious that we would be aggravating the very symptom we wish to remove. This shews the danger of employing any nostrum; and there is no remedy yet discovered, however valuable it may be, and however specific its effects may appear

* Dublin Hospital Reports, vol. v.

in the cure of any disease, that is admissible in every case of the sort.

Attention must be paid to the state of the bowels; for it not unfrequently happens, that hæmoptysis will cease, as soon as purgative medicines are given, and operate.

In addition to this, the good sound advice given for such cases by the great Laennec, in very few words, must be implicitly obeyed. He enjoins "rest and absolute silence, a cool air, abstinence from wine and stimulant food, and a regimen proportioned in strictness to the severity and extent of the hæmorrhage."*

Diet. — There is nothing connected with the medical treatment of consumption where so much difference of opinion has been entertained, as in regard to the diet best suited for such cases. This is purely the result of the erroneous views which have so long prevailed relative to the pathology of tubercular phthisis, and the inattention to the morbid changes which take place during the progress of the malady. To lay down an universal diet-table for all consumptive patients,

* Op. cit., p. 130.

would betray an utter ignorance of the nature of phthisis, and more especially of its attendants. Indeed, there are few subjects connected with the management of consumption, requiring more calculation and discernment than the present, but he who is guided by the dictates of pathology, and pays due regard to the capabilities of the digestive organs, will but seldom err.

In every case the diet of the consumptive invalid ought invariably to be as nutritious as the degrees of inflammation and fever will admit, and the stomach digest. As, however, no two cases will be found where these conditions are exactly alike in degree, so no two consumptive patients will be found who ought to be dieted alike in every respect. As our great aim in attempting to arrest the progress of consumption is to prevent future absorption of inorganizable matter, and to overcome the inflammatory action produced in the organs of respiration by the presence of tubercles, so must the articles of food be the most nutritious, while they are purely antiphlogistic. Without professing to do full justice to this subject, which of itself would engross the

whole space devoted to this essay, I shall point out a few articles that are generally admissible in the first stage of consumption, the stage in which the malady may be arrested.

Milk.—There is no article of diet that has been so long, so strongly, and so deservedly extolled, as milk, for consumptive invalids. We find it even laid down as a cure for the disease; but this was the case more particularly in the early records of medicine. The professors in the medical schools of Cnidos and Cos, certainly endeavoured to discard it in consumption; but Hippocrates, after leaving Cos, his birth-place, re-established the practice, and was universally followed in it by all the physicians of the next age. Galen, Aretæus, Oribasius, and in fact almost every author who has written on the subject, speak in terms the most favourable of the use of milk in consumption. The intelligent Dr. Hoffman, whose views of medicine were superior to most of his cotemporaries, was so much struck by the good effects of milk in disease, that he published a treatise on the subject. And although he has certainly over-rated its powers, still he seems to have been fully aware

that it was only suited for the early stage of consumption, which may be inferred from the following quotation from his work. "Yet we must take notice," says he, "that though this be such a sovereign remedy for consumption, and when given in a judicious manner, scarce ever fails of success, yet it will not cure every sort of consumption, but must be applied in the beginning of the distemper."

Milk is almost the only nutritive fluid with which nature has presented us, and the only one that can be commanded in quantity sufficient for every-day food, when required. The patient who is afflicted with consumption, and as yet in the first stage of this malady, will find it a valuable, nourishing, and safe article of diet, which properties are, I think, sufficient to recommend it, particularly where there are so few on which the same encomium can be bestowed. Let it be, however, distinctly understood, that it possesses none of those curative properties which have been attributed to it, and it is only useful to the consumptive invalid because it is nutritious, and at the same time antiphlogistic. The satirical Dr. Gideon

Harvey, gives his opinion relative to the use of milk in consumption, but in terms almost too plain for quotation; however, as his judgment deserves respect, we shall excuse his vulgarity. He observes, that "ass doctors may as well attempt to roast a capon on the Thames, as to cure an ulcer in the lungs, by the use of milk. It is pretended, that cures have been effected by asses' milk; but in truth, neither man, nor woman, nor child, has ever been cured of an ulcer of the lungs, by any kind of milk." In this, Dr. Harvey is perfectly correct.

But from the mild nature of milk diet, the patient, who is in the first stage of consumption, and makes it a chief article of his food, will find the symptoms produced by tubercles give way to medical treatment much more readily than they would otherwise do, and under this regimen there is very much less chance of the lacteals absorbing more tuberculous matter. The milk of the ass is, generally speaking, to be preferred—it has been recommended by most physicians, both ancient and modern. Dr. Moffett says, in his "Treatise on Food," that "asses' milk is an especial cure for that sort of consumption wherein the flesh decayeth

through ulceration of the lungs; it is both meat and medicine." Dr. Arbuthnot in his "Treatise on Aliments," remarks, "that woman's milk is the sweetest as to the nutritious quality, the next is that of asses.

Dr. Paris observes, that "milk, in its dietetic relations, may be considered as intermediate between animal and vegetable food; it is easily assimilated, and therefore affords a quick supply of aliment to the system, while it does not excite that degree of vascular action which is produced by other animal matters."* Additional nutritious properties may be conveyed to milk by the addition of suet. The latter ought to be placed in a muslin bag, and immersed amongst the milk, which is then to be simmered over a gentle fire. It not unfrequently happens, however, that this is too indigestible a repast for consumptive invalids; but where the stomach can easily dispose of it, the patient will derive additional benefit. And let it be here observed, that the addition of lime-water, or of some other alkaline substance, will prove of decided advantage to those who are subject to acidity of the stomach on taking milk.

* Dr. Paris on Diet, p. 206.

The milk of the human female has been strongly recommended by Alpinus and some others, for phthisis, as also that of the cow, sheep, goat, and mare.

Eggs are also a valuable article of diet for the consumptive patient. They have been approved of for such, by Aretæus, Dioscorides, Ettmuller, and indeed by most modern physicians who have paid attention to consumption. I have found them particularly serviceable and admissible in most cases of this description; but much depends on the manner in which they are cooked, to render them agreeable to the caprice of individual stomachs. Some can digest them most readily when they have been eaten raw; and when such is the case, I find the condition of the system improve under them. The following observations, on this article of food, as presented to us by the intelligent Dr. Paris, are alike useful and interesting. He says, "eggs, in point of nutriment and digestibility, may be classed next to milk; but their qualities will greatly depend upon the manner in which they have been cooked. When raw, they are certainly not so easily digested as when lightly boiled, so as slightly to coagulate the albuminous part; but if

this process be carried too far, they are converted into a hard mass, which requires all the powers of the stomach for its chymification ; but this is much accelerated by the use of vinegar as a condiment. They are distinguished by the peculiar quality of singularly affecting some stomachs, even in the smallest quantity ; while they do not produce any uneasy impression on others. I am acquainted with a person who constantly finds an egg to produce uneasiness when his stomach is the least deranged, but who can eat them with impunity at all other times. It is a notorious fact, that eggs, when raw, are laxative, and when cooked, are apt to produce costiveness." *

Fish, when perfectly fresh, is well calculated for an article of food for those in the first stage of phthisis. It is less nourishing than mutton or beef ; nevertheless it contains no inconsiderable share of nutriment, and does not occasion that vascular excitement which follows the use of flesh. Fish is, at the same time, easy of digestion, and makes a pleasant repast ; but there are some sorts much better suited for the consumptive invalid than

* Op. cit., p. 207.

others. In making a selection, we of course ought to choose that which is most nutritive, and at the same time least stimulating. The fresh-water trout, the turbot, cod, whiting, haddock, flounder, and sole, deserve the preference. Even these may, however, be rendered decidedly pernicious to phthisical invalids, if not cooked so as to accommodate the stomach. On no account ought they to be prepared with butter, lard, or any fatty substance, nor ought any such condiment to be used with them. They should be plainly boiled, and the patient will promote his own interest by declining every sort of condiment to them, with the exception of that which nature claims as only her own,—a moderate quantity of kitchen salt.

Salmon, mackerel, eels, and all such fish as are stimulating and difficult of digestion, must be rejected.

The only shell fish that I would recommend as an article of diet for consumptive patients, is the oyster. Oysters are very nutritious, and rarely disagree with the stomach. They are most digestible when eaten raw; and although pepper and vinegar may render them more palatable, and even

assist in the process of digestion, nevertheless the consumptive invalid ought to decline these additions, for reasons, by this time, not requiring re-explanation.

Before concluding these observations on fish, I consider it necessary to offer one precaution. Milk, it has been shewn, is a most valuable article of diet for the consumptive patient, and fish also recommended to those afflicted with phthisis. Let it, however, be kept in mind, that there are but few things so little compatible with each other in the stomach, on which account they ought never to be taken together, or at the same time. Derangement of the digestive organs, irritation of the alimentary canal, diarrhœa, and other unpleasant consequences, often follow such a combination.

Fowls.—As Dr. Paris observes, "there exists a great variety in the qualities of the food which is furnished by this class of animals, with regard to nourishment, stimulus, and digestibility." For the consumptive invalid we must consequently select those which, while nutritious, are devoid of stimulating qualities. Where a judicious selection is made, the patient need not hesitate in making a

diet off the flesh of fowls, for it is alike safe and useful, and well calculated for an article of diet in every stage of phthisis. The breast and wings of chickens, I think, deserve a preference, and in many cases partridges, grouse, and pheasants, are admissible, although more irritating than the former. This will, however, depend on the nature of the case, for as Van Swieten truly remarked, "to assert a thing to be wholesome, without a knowledge of the condition of the person for whom it is intended, is like a sailor pronouncing the wind to be fair, without knowing to what part the vessel is bound."

Ducks, geese, and such birds as are strong, stimulating, and indigestible, are on no account to be allowed the phthisical patient.

Sound wheaten bread, arrow-root, sago, rice, and potatoes, are unexceptionable articles of diet for consumptive invalids, but should not be taken in great quantities.

Beef, mutton, pork, venison, and the like, are decidedly too stimulating to be admitted as articles of diet in the first stage of phthisis, and the epicure who cannot control his inclinations for such,

while in this stage of the malady, will, in all probability, find the consumption of his lungs keep pace with that of such diet as I have just condemned. But these comments, be it observed, only apply to the term when phthisis is in the first stage.

Whatever articles of food are taken, and whatever be their properties, moderation is imperative. I have certainly never seen any necessity for recommending Cornaro's restricted amount of diet, who only allowed himself twelve ounces of food during twenty-four hours.

The patient, however, who attends to the following observations, offered by Dr. Philip, will avoid the danger of injuring himself by overloading his stomach. He says, "the dyspeptic should carefully attend to the first feelings of satiety. There is a moment when the relish given by the appetite ceases; a single mouthful taken after this, oppresses a weak stomach. If he eats slowly, and carefully attends to this feeling, he will never overload the stomach."

Drink.—The drink best suited for patients while in the first stage of pulmonary consumption, is

milk, barley-water, or tea. It must be unnecessary to observe, that spirits, wine, porter, ale, and stimulating fluids of every description, would be directly and immediately injurious.

Temperature.—Having, in a former chapter, offered some remarks on the influence of climate on pulmonary consumption, it is almost unnecessary to enter into the consideration of that best suited for those in the first stage of phthisis. Let me, however, just observe that an equable climate is that which ought to be preferred, and the locality one where the atmosphere is humid. A high degree of temperature is by no means beneficial. The apartments occupied by the consumptive invalid ought to be kept at an equal temperature, day and night, and during the winter months the heat ought not to exceed 62° of Fahrenheit, for if it is carried higher, any exercise in the open air will, in all probability, be followed by fresh attacks of inflammation in the pulmonary tissue and air passages.

Clothing. — Warm clothing is indispensable, and ought to be regulated, not only by the season of the year, but also by the daily variations of tem-

perature. In my opinion, every person predisposed to, or suffering from, pulmonary consumption, ought invariably to wear flannel next the skin, and so shaped as to extend well up on the chest, reaching at least the collar bones, and equally high on the back. There cannot possibly prevail a more decidedly hurtful practice, than that of throwing off flannel during the summer months. Then is the very time of all the year that it is most serviceable, absorbing the perspiration, and counteracting those bad effects which, in some constitutions, are certain to follow sudden heats. It is, moreover, as Sir Benjamin Thompson says, "a great luxury," independent of its utility. The feet ought to be kept warm and dry, and nothing will tend more to the comfort of the phthisical patient, while in the first stage of the disease, than washing them every morning in water, the chill from which is just taken off, and when they are thoroughly dried, put into clean lambs-wool stockings. There is no part of the body so much influenced by the state of the feet as are the lungs and air passages. This must have attracted even the most inattentive observer, and I can confidently assert that there are few parts

more deserving of care, particularly in phthisical invalids. The shoes ought to be thick, and when the ground is at all damp, India-rubber clogs will prove of signal service. These clogs, in fact, constitute by far the most valuable addition that has for many years been made to the articles of dress. Every phthisical patient who takes walking exercise in the open air ought to wear them.

Exercise.—I need not say that exercise is not only requisite, in order to preserve health, but equally so for re-establishing it when lost. Walking, riding, sailing, swinging, and many other varieties of active and passive exercise have been individually advocated in consumption. Hippocrates considered walking most essential in this malady, and he tells us that it ought to be gradually increased to ten or fifteen miles daily. Of course, such exercise must be regulated by the strength of the patient and state of the weather, and when he does walk, the pace ought to be moderate, and not continued above an hour at a time. The good effects which have so often resulted to the general health from riding, have been so apparent as to secure for it general approval. Riding on horse-

back merits a preference, but where the weather, or patient's health, will not admit of this healthful exercise, carriage airings ought to be taken. Sydenham, in his letter to Cole, speaks very extravagantly of horse exercise, where he says, "I do not hesitate solemnly to affirm, that neither mercury in syphilis, nor bark in intermittents, is more effectual than riding in consumption." Although he overrates this exercise very much, nevertheless it must be allowed that it is of great use to the phthisical patient, and we have the testimony of Desault, Baglivi, Lassalle, Southey, and many others, in its favour. Van Swieten used to recommend persons of the lower classes of society, who were confined to sedentary occupations, to procure employment as coachmen, and he is persuaded that by this advice he has saved the lives of many.

Sailing.—A sea voyage has often effected an apparent cure of phthisis, and it certainly merits trial. Laennec says, "I am convinced that in the present state of our knowledge, we have no better means to oppose to this disease than a sea voyage, and a residence on the coast, in a mild climate."*

* Op. cit., p. 369.

SWINGING is advised by some physicians. Dr. Carmichael Smyth* made numerous experiments on its effects, at the Middlesex Hospital. I can, however, offer no comment on the subject, never having given it sufficient trial.

PART III.

CURE OF CONSUMPTION.

BEFORE giving any account of the mode of treatment which is found most successful in the cure of pulmonary consumption, it is very necessary that we consider what change must take place in the lungs before a cure can be effected. Again, it may not be devoid of interest or advantage, to shew what power medicine possesses in curing this malady.

In the first place, it must be kept in mind that the disease termed tubercular phthisis, or consumption, consists in the presence of inorganizable matter in the lungs. Where it comes from, or how it gets into the lungs, is not now the subject of inquiry. Let it, however, be distinctly under-

* Vide Dr. C. Smyth's account of the effects of swinging in pulmonary consumption and hectic fever.

stood, that as soon as tubercular matter is deposited in the lungs, then is the individual consumptive. It must, therefore, be apparent, that so long as this tubercular or inorganizable matter remains in the lungs, so long does consumption last. The cure of consumption, therefore, implies the removal of all inorganizable matter from the lungs, and, in addition, the restoration of the lungs to health, from the effects which tuberculous matter may have produced in them, such as ulceration, &c.

Such is the cure of consumption.

Let us, in the next place, inquire into the power which medicine possesses over inorganizable matter when deposited in the lungs. This is soon told. Up to the present day there is no medicine, agent, or combination of substances; there is no simple or compound substance, whether solid, liquid, or gaseous, nothing in fact existing, or that can be made, which has yet been found to have the power of removing inorganizable matter from the lungs.

Numberless agents and medicines have been employed with this view, but each and all have been totally useless. Those which for a time excited attention, were oxygen, hydrogen, carbonic acid

gas, iodine, chlorine, antimony, bismuth, &c., but every physician must know how totally useless they are in this respect, and that were they persevered in for another century, they would not, during that period, cause the absorption of one grain of tubercular matter from the lungs. I hesitate not to say that the physician who professes to remove inorganizable matter from the lungs, and consequently cure consumption, by any given medicine, or by any combination of medicines administered together, whether in the shape of vapour, solution, or any other form, or whoever places great stress on any one nostrum, is either an ignorant man, unfit to practise medicine, or an impostor, having at heart more the interest of his private exchequer than his patient's health. Were such a medicine found, it would not require to be puffed and repuffed in journals. It would soon recommend itself, and entail immortal honour on the man, and even on the name, that discovered it. By these remarks let me not be understood to reflect on the character of any man. Should it unfortunately apply to any, let him blush. My sole object is to disabuse the public mind; a duty the medical pro-

fession owes the public, and one which, if fulfilled, would not only be of infinite service to the profession, but a valuable caution in the protection of health against the often fatal effects of empyrics, and the more culpable imposition of professional quacks.

By these remarks, I do not at all mean to imply that consumption is an incurable disease, and that the unfortunate individual who has tubercles in his lungs must necessarily fall a victim. "That pulmonary consumption admits of a cure," says Sir James Clark, "is no longer a matter of doubt."* And Dr. Carswell observes, that "pathological anatomy has perhaps never afforded more conclusive evidence in proof of the curability of a disease, than it has in that of tubercular phthisis."† That it is curable, I can confirm, not by a bare assertion only, but by living evidence, which to the non-professional might appear the most satisfactory; although, in fact, our best proof of the curability of this disease is to be found in the cicatrized excavations found on post mortem examination.

But when a cure is effected, how does it take place? Not by any magical effect which medi-

* Op. cit., p. 137. † Op. cit.

cine exerts on the organizable matter—not by stimulating the lungs to absorb it—not by any mysterious or miraculous interference of Providence; but by the simple, but beautiful effort of nature, which was described in the chapter on pathology, when shewing how a thorn is discharged from the finger without the interference of man. I have already explained the effects which tubercles produce in the lungs. Let us, however, again refer to this subject. Tubercular matter, being inorganizable, when deposited in the lungs acts as a foreign body on the pulmonary tissue, thereby producing irritation. How does nature interfere to relieve the body of this source of disease? Inflammation ensues as soon as irritation is produced; suppuration follows as a consequence, and a communication takes place between the suppurated part and a bronchial tube, through which not only does the pus escape, but along with it the inorganizable matter, and the whole are expectorated. As soon as the inorganizable matter is thus thrown off, then the irritation and inflammation gradually subside, the cavity becomes healed up, and a cure is effected. Such is the only way that a cure of

consumption does or can take place. It is therefore seen, that a cure only occurs in the last stage of this disease, and that nature effects it.

We have now to inquire into how far art can be made available, in aiding and assisting in the cure of consumption.

The inflammation consequent on tubercles would often, if not moderated, run so high, as to destroy life, before a cure could be effected. The physician can therefore regulate this process, thus giving nature time to act. Hectic fever, diarrhœa, and perspiration, are generally present, and reduce the strength and animal power so quickly, that, if not opposed, the patient would not survive till nature accomplished a cure. Here again medical skill protects the patient, if skilfully and judiciously exercised. Cough is in almost every instance so harassing as to fatigue the sufferer, and prevent the natural and necessary rest, thus reducing the strength. Moderating this, is therefore of essential service.

Another most important object is to arrest that morbid condition of the system by which absorption of inorganizable matter takes place; for until

this is done, absorption of tuberculous matter will continue, and now that inflammatory action is going on in the lungs, it is certain to accumulate, and thus perpetuate the disease, till life is sacrificed. This constitutes the most important department of phthisical practice, and is that which has been so universally overlooked—a circumstance, which in a great measure accounts for the want of success attending the medical treatment of consumption in the last stage. It not only embraces the management of the digestive organs, but the treatment of the morbid state of the lacteals.

All these and many other circumstances claim the attention of the physician, and he who can treat them most skilfully will be most successful in phthisical practice.

From these observations it is apparent that nature cures consumption, where art protects and supports the system till such time as a cure can be accomplished. In protecting the health till nature effect her object consists the medical treatment of the last stage of pulmonary phthisis. The practice is perhaps the most critical of any within the whole range of medical science; and I feel con-

vinced that it is impossible to become at all successful in it, without very great experience, deep reflection, ready discernment, and prompt treatment. No two cases will be found where the same remedies are applicable; and he who recommends any medicine, of whatever nature or form, as universally suited for consumption, betrays either his ignorance or fraudulence.

The physician who has discovered that any particular medicine or agent is valuable in the treatment of phthisis, must have some idea in what way it does prove serviceable. I do not mean to assert, that in every instance we can explain the principle upon which a remedy acts; but where such is not the case, we can at least see the result. Some will improve the deranged process of digestion, others will tend to overcome inflammation produced by tubercles, and subdue in degree many of the most troublesome symptoms of the disease. In fact, every remedy employed by an intelligent practitioner is prescribed with some direct motive, and never with the expectation that it can remove the tubercular matter from the lungs, and heal up the ulcerous excavations. To expect such unprecedented

wonders would be to look for an impossibility. What can therefore be more vague, than for a medical man to recommend any remedy as eminently successful in the treatment of consumption, without specifying in what way it proves useful; whether in subduing irritation and inflammation in the respiratory organs, in subduing the diarrhœa attending phthisis, or in restoring to healthy action the organs of digestion?

When suppuration has taken place in the lungs as a consequence of tubercles, and phthisis has reached its last stage, then the practitioner has much to combat against. His objects are to prevent further absorption of inorganizable matter from going on, and to adopt every measure which is likely to obviate additional deposition into the pulmonary tissue of that tubercular matter already circulating with the blood. This important part of the treatment has already been described, being exactly the same as the means recommended in the chapter on *Prevention*, and consequently not requiring repetition. But in addition to this local inflammation, hectic fever, diarrhœa, perspirations, cough, ulceration in various portions of the mu-

cous lining of the primæ viæ and respiratory organs, and general derangement of the system, require prompt attention.

I shall now advert, as briefly as I can, to the treatment best suited for such emergencies.

Local Inflammations.—We have seen that in the first stage of phthisis inflammatory action followed the deposition of tubercular matter in the lungs. When the disease has reached its last stage, it is the consequence of that inflammation having run so high, that now it is equally, and in fact, more severe, than in the first stage of the malady. The lungs are, moreover, now more susceptible of irritation, and consequently of inflammation and congestion, than in the first stage of phthisis. Such being the case, the medical treatment necessary to moderate or subdue these conditions must be proportionably more powerful, while it generally requires great perseverance. The means recommended with a similar view in the last part of this chapter, are here again applicable; these are, counter-irritants, depletion, moderating the force of the circulation, &c.

However much the patient may be reduced—

however hopeless the case may seem—however certain and inevitable death may appear, I would never fail in counter-irritating the chest. This treatment I have often found of signal benefit, where regulated and judiciously managed, even in cases where every hope of recovery had fled; and when aided by collateral treatment, has in some instances proved successful in saving life, where the patient was considered to be sinking. This I shall illustrate in the case of a copper-smith, which will be found at the conclusion of the present chapter. When consumption has reached its most aggravated extreme, and has assumed its most mortal and threatening aspect, still I would not in despair abandon this remedy. To some it may appear useless, but still the patient ought to have every chance, under whatever circumstances he may be placed. Let me however observe, that where the counter-irritation is not regulated, then it is in reality useless, and in place of proving of service to the patient, will reduce his strength and accelerate his fate.

Venesection, which was found so useful in the first stage of phthisis, will not prove less so in the

last. The patient may appear too weak to admit of venesection; nevertheless, so far from reducing his strength, it will, by moderating the inflammation and other symptoms, prove a restorative. The quantity of blood taken from an adult in the last stage of phthisis ought not to exceed five ounces, but may be often repeated.

Vascular action must be kept low, and for this purpose the digitalis will prove of sovereign utility. It may be combined with hemlock, and persevered in to a considerable extent, where the medical attendant has ample opportunities of watching their effect.

In moderating or subduing the inflammatory action in the respiratory organs, uniformity of temperature is no less necessary than the foregoing means.

The antiphlogistic regimen that was so serviceable in forwarding our views in the early stage of consumption, would again prove equally useful in the last stage; but now, unfortunately, it is no longer admissible. I shall not, however, at present enter into the consideration of the diet now required, but leave this subject for future deliberation.

It unfortunately happens, that in the last stage of consumption, inflammatory action often takes place in small portions of the mucous lining of the primæ viæ. Where such can with certainty be discovered, it ought to be treated according to the circumstances of the case; for where neglected, it will bring on diarrhœa much earlier than it would otherwise have appeared.

The stomach may become the seat of inflammation from two causes; first, by sympathizing with the lungs, and secondly, by being along with them, and portions of the alimentary canal, the seat of tubercular deposit. Extensive deposition of inorganic matter in the lungs will often produce slight inflammation in the coats of the stomach, and when ulceration takes place in the former, inflamed patches will often be found in the latter. Louis tells us that he found it present in seventeen out of ninety-six cases. The symptoms indicative of this state of the stomach, are loss of appetite, thirst, nausea, and occasionally vomiting. Where it depends on sympathy, which it does in seven cases out of twelve, it will disappear when irritation ceases in the lungs, but a few leeches applied over

the epigastrium will afford marked relief. The same treatment will also be serviceable when the inflammation results from the presence of tubercular matter. Ulceration occasionally occurs, perhaps, as Louis says, in one-twelfth part of the cases.

The mucous lining of the alimentary canal is almost invariably inflamed in some part of its course, and not unfrequently ulcerated. This generally proceeds from a deposition of tubercular matter in that membrane; and in such cases, leeches are very serviceable. The consequence of these morbid conditions of the stomach and alimentary canal are, indigestion, diarrhœa, emaciation, &c.

Cough is generally a very distressing attendant on the advanced stage of pulmonary consumption. Indeed, where matter is formed in the lungs, and has found an outlet by the air passages, coughing alone can discharge it. It cannot, therefore, under such circumstances, be entirely removed, but ought to be moderated. With this view I have never employed any medicine so successfully as the muriate of morphia in solution, and combined with digitalis and some preparation of squills. In the

first stage of consumption, the addition of antimony was advised, but now that the disease has advanced so far, it is no longer admissible, being apt to induce diarrhœa, and encourage the perspirations.

Inhalation of the steam of warm water, with which some anodyne medicine may be volatilized, will also prove serviceable, rendering the expectoration more free and easy, while it assists in subduing the irritation in the lungs and air passages.*

Diarrhœa.—This is one of the most distressing attendants on pulmonary consumption, indeed, the most so out of the whole catalogue. As formerly stated, it is the consequence of a morbid condition of the stomach and bowels, and will appear with and retain an obdurateness proportionate to that of its cause. There is, as Louis has remarked, an exact correspondence between the diarrhœa and the disease of the intestines, to which it is attri-

* Mr. Jeffreys, the inventor of the Respirator, which is noticed in this work in the chapter on Prevention, has written a most ingenious and clever paper in the Medical Gazette for March 4th, 1842, on artificial climates, where he describes an apparatus by which a patient may constantly breathe any degree of temperature suitable for his disease, either medicated or otherwise. The Inhaler invented by Dr. Harwood, St. Leonards-on-Sea, I recommend, as requiring less muscular action, and being consequently less fatiguing to the patient. Mr. Waugh, 177, Regent Street, sells it.

butable. Where the diarrhœa only precedes death by a few days, this seemed to be equally the case with the ulceration of the bowels. In the advanced stage of phthisis, however, diarrhœa sometimes depends, as in the early stage, on improper food, vitiated secretions, &c. ; but when it becomes chronic, and proceeds uninterruptedly, ulcerations are almost certain to exist in the intestines. It may not make its appearance till the very close of the malady, but occurs almost universally at some period. Louis found in 112 cases of pulmonary consumption, only five where diarrhœa did not take place.

There is no other attendant on phthisis that exercises such a power over the patient as does diarrhœa, and in proportion to the number and frequency of the stools, so will the sufferer lose flesh and strength, and consequently so much the sooner will he fall a victim to his malady. Violent griping pains in the intestines often precede the stools, and after them temporary loss of strength supervenes, so as occasionally to produce fainting. The patient cannot, therefore, be too careful in attending to the treatment recommended by his medical adviser.

The treatment of diarrhœa will of course depend on the circumstances which may have produced it. Where it is the result of improper diet or vitiated secretions, gentle laxatives may be administered, but with the greatest caution; and where enemata will answer the purpose, they certainly deserve the preference, being very much safer. If, on the contrary, the diarrhœa depend on ulceration of the bowels, the treatment must be exactly the contrary. I am not aware of any medicine better calculated to forward our aim under such difficulties, than a combination of the tinctures of opium and catechu. They must, however, be administered in large doses. This mode of treatment, I am well aware, has been much ridiculed by many eminent medical men; but the mild, or rather inert remedies, they have from timidity only ventured to use, are totally inadequate to fulfil the purpose for which they were prescribed: and as in consumption the patient's strength must be husbanded, and as debility keeps pace with the frequency of the stools, if the practitioner do not avail himself of powerful measures to correct the diarrhœa, the patient will to a certainty fall a victim to his timidity.

I, however, have no objection to occasional enemata of starch and opium; but where the case is urgent and obstinate, the practitioner will find his object more certainly attained by the use of opium and cathecu, taken as before recommended.

Hectic Fever and Profuse Perspirations are invariable attendants on consumption, although there is no certainty in what stage, or period of a stage, they may make their appearance. Generally speaking, they commence in the first stage of phthisis, although they are not unfrequently so slight as to escape notice for a length of time. I believe it is unknown to what morbid state of the system they are to be attributed; for we may or may not find them in the first or purely tubercular stage of the disease; while suppuration may have commenced, and even continued for some time, without these, so frequent concomitants on phthisis, manifesting themselves.

Louis frankly confesses that, "except in cases of very acute or very chronic phthisis, it was impossible to appreciate the circumstances which (even) accelerated or retarded the presence of the febrile state." Sir James Clark considers that the

fever is more modified by inflammation of the respiratory organs, and gastric and intestinal irritation, than by the primary tubercular disease. The first indication of hectic fever which attracts the notice of the patient, is generally a feeling of cold towards evening. This gradually increases, and is soon followed by a sensation of heat in the skin, more particularly of the face, palms of the hands, and soles of the feet. Although these febrile attacks are generally restricted to the evening, still they may be repeated several times during the day, especially about noon. Perspiration now follows these paroxysms, and when the patient sleeps they are distressingly profuse, especially towards morning. At first it is not unfrequently restricted to the head and chest, but soon becomes general.

Louis has paid particular attention to the connexion supposed to exist between the diarrhœa and the perspirations, some considering them supplementary of each other, but he could never discover any proof to that effect.

Although hectic fever is often severe, still it is not attended by those pressing symptoms which attend other fevers. Nevertheless, when hectic

fever and profuse perspirations are established, the body quickly wastes, and, if they are accompanied by diarrhœa, very soon reduce the patient.

It is so far happy, that although we are ignorant of the true pathological condition which constitutes hectic fever and perspirations, nevertheless there are few attendants on consumption that can be more readily modified by treatment, particularly the former. I consider that sulphate of quinine, combined with sulphuric acid and cold water, will prove more serviceable than any other remedy: the perspirations generally soon become moderated, the fever diminished, and the strength much restored. As, however, the exciting causes of these symptoms still remain in force, the medicine will not produce a permanent effect, and therefore its use must be continued when necessary, unless contraindicated.

Diet.—In addition to these observations little more is required. We shall therefore briefly consider what diet is best adapted for the patient in the last stage of consumption. Great diversity of opinion exists on this subject; some recommending low soothing food, while others consider highly nu-

tritious food indispensable. My own opinion is, and it is formed on, and confirmed by, the result of extensive practice, that unless a highly nutritious diet is prescribed to a patient having ulcerated lungs, he has but a very poor chance of recovery. That such is the case I am fully convinced from undeniable evidence, and I think it can be rationally accounted for.—The stomach being debilitated by irritation from local and sympathetic causes, must not be loaded by any sort of food; consequently the supply ought to be of that which contains sufficient nutriment in the smallest space. What can we recommend more suitable for such a condition than animal food in small quantities, often repeated, with a moderate quantity of the best beer as a drink? Again, the absorption of chyle by the lacteals is imperfectly performed, in consequence of the diseased state of their mouths, and the morbid condition of the alimentary canal. We must therefore present them with an amply sufficient quantity of pure chyle, so as to secure the requisite supply to the system. Lastly, whenever there exists an ulcer, in whatever part of the body, and the discharge from it is copious, unless the loss

so sustained by the system be made good by extra nutrition, debility soon ensues, and the patient quickly becomes emaciated, and loses strength.

In the last stage of consumption the organs of digestion will not act upon a sufficient quantity of vegetable and milk diet, so strongly advocated by some, to supply the necessary quantity of nutriment. Such being an undoubted fact, the patient must be allowed what animal food his stomach can readily digest, eggs, fish, jellies, &c., rendering the change as agreeable as possible. Although I have recommended beer, and would give the preference to the best porter, I do not look upon wine as of much service, unless where the debility is extreme, with a tendency to fainting. Under these circumstances, a moderate quantity of port will certainly prove useful.

Dr. Paris tells us, what must, however, be apparent to the most ordinary reasoner, that animal food already possesses a composition analogous to that of the structure which it is designed to supply, and requires little more than division and depuration; whereas, vegetable food requires a complicated series of decompositions and recompositions, which

must be effected before the matter can be animalized, or assimilated to the body. Animal food being very much more digestible than vegetable, is therefore most certainly on this account entitled to a preference. The only objection, in fact, that can be advanced against animal food and highly nourishing diet is their stimulating properties. They, however, can in a great degree be overcome by medical treatment.

CASES.

CASE I.

W. M., aged 45, by trade a coppersmith, born of healthy parents, had been in the enjoyment of sound health till within the last twelve months—his chest was well developed, muscles large, dark hair, and hazel eyes—in fact, the entire appearance of this man repelled any idea of his being naturally predisposed to pulmonary consumption. For some years he had addicted himself to intemperate habits, such as dram-drinking, late hours at night, exposure to wet and cold. In consequence, his appetite began to fail him; his muscular strength was much impaired, and for the last fifteen months he was attacked with cough and profuse expectoration—for this he was bled, blistered, and took aperient and expectorant medicines, according to the account of the medical attendant who had charge of him. The cough, however, still continued, with

the expectoration; he also had night-sweats, and the other symptoms of hectic.

At this time I was called in, and I found him in the following state:—considerable emaciation; pulse frequent and rather weak; dyspnœa, more especially on ascending a height; can rest equally well in any position; sleeps badly at night; cough very troublesome, and expectoration profuse. On applying the stethoscope I detected distinct pectoriloquy under the right clavicle, with cavernous respiration; dulness on percussion over the lower portion of the right lung, with puerile respiration in the superior portion of the left lung.

Here the indications of cure were obvious—the size of the cavity in the right lung was of small extent; some tubercular infiltration in its lower part. I employed counter-irritation forthwith, first by means of tartar-emetic ointment, and afterwards by a succession of small blisters; attended carefully to the state of the digestive organs; had the patient removed from London to a more healthy situation near town; prescribed a strict regimen, with such medicinal means as might tend to soothe the cough and facilitate expectoration; gave him an occasional

opiate at night. At the end of about six weeks there was perceptible improvement in all the symptoms; the patient had evidently gained flesh and strength; cough was considerably diminished, and with it the expectoration; his appetite was restored; the stethoscopic signs were much improved, no pectoriloquy; there was, however, an absence of the vesicular respiratory murmur in the site of the cavity, over a small extent of surface, with dulness on percussion in the same place. After another month the patient was able to resume his ordinary occupation; and still continues free from cough, or any uneasiness with respect to the functions of the respiratory organs. He rigidly adheres to the strict regimen which I originally prescribed for him, and is much improved in every way—in fact he states that his health is now better than he felt it for the last six years.

Remarks.—Here was a case well calculated to shake one's faith in the necessity of ulceration for the elimination of tubercular depositions from the lungs. Such elimination was evidently owing to the effects of the well-regulated employment of counter-irritation. We leave it as a problem, for

the solution of the physiological pathologist, How was the tubercular deposition, which evidently existed through a considerable portion of the right lung, removed? We must not reject the advantages of a therapeutical agent, because we cannot account for its modus operandi.

CASE II.

E. L., a lady, 27 years of age, married, and the mother of four children rather delicate in appearance—tall, dark eyes and hair, with a narrow chest—parents still living and in good health, brothers and sisters all healthy. This lady consulted me for a cough, which had come on her within the last three months without any obvious cause; the cough was not very severe, but of that character which is popularly termed "teasing." She has been for some time subjected to considerable depression of mind, from family annoyances; finds some difficulty in going up a hill, or even in ascending the stairs; her appetite much impaired, flesh rather flaccid, sleeps badly, but can lie indifferently on either side; the expectoration purely of a mucous character.

On percussing the right side of the chest, there was some dulness on percussion under the right clavicle, the respiratory murmur in the same part being also diminished; I thought I detected a slight mucous râle under the clavicle of this side, this was not, however, very decided; no pectoriloquy.

Here I prescribed counter-irritation by means of a small blister, which I kept open for some weeks, and after allowing it to heal, I examined the same part of the chest again, where, though the vesicular murmur was not quite as loud as in the normal state, still I was decided that no râle was audible in the part. Strict attention was paid to the functions of the skin, those of digestion, &c., and again counter-irritation was resorted to in the same place as before. After a few weeks more there was a decided improvement in her appearance; her cough was entirely gone; her appetite restored; no appearance of hectic now about her: in fact, she now enjoys as good health as she has done for the last seven years.

CASE III.

A. C., a young gentleman, 17 years of age, of delicate appearance, fair hair, parents healthy; still the body exhibits all the outward signs of a strumous diathesis; in consequence of an attack of hæmoptysis his parents had to remove him from a boarding-school where he had been residing. This youth never complained of any pulmonary affection previously; had always enjoyed tolerably good health. On being called to see him, I examined his chest, but found nothing wrong. I ordered him to be kept perfectly quiet, to sleep in a well-aired room; bled him from the arm to a small amount; applied a blister of the size of half-a-crown, which I kept open for a fortnight; gave him some aperient medicines; prescribed a strict regimen; and since that time (now six months ago) he has had no return of the hæmoptysis, and is able to resume his studies.

CASE IV

M. L., a married woman, aged 32, has had several children, and has enjoyed good health until within the last six months, when, in consequence of cold, she was attacked with a rather severe cough, attended with copious expectoration, for which she was bled, blistered, and took some aperient medicine. These means relieved considerably the severity of the fever, and the other more violent symptoms; but the cough and expectoration still continued, with but little abatement. On being consulted on the case, I ascertained her state to be as follows:—Chest well developed; emaciation considerable; mucous and sonorous râles on the anterior and posterior part of the chest; in the subclavicular region on the right side there was observable some bronchophony, with the ratio between the inspiratory and expiratory murmurs, as it exists in the normal state, completely subverted. Sound, on percussion, dull on this part of the chest, but with the natural clearness everywhere else. Here it was evident that tubercular deposition was commencing, but had as yet occurred in but very

small quantity. From the very early stage at which the disease was presented to me, I formed rather favourable hopes of preserving my patient's life; in which I was not at all disappointed, as, by the adoption of the means obviously indicated, and by steadily persevering in the treatment, both hygienic and medicinal, the lung was, after the lapse of about two months, perfectly restored to its healthy state.

CASE V.

J. W., a married man, aged 37, a shoemaker, had indulged, for several years back, in the habitual use of ardent spirits; about twelve months before I saw him he had got a wetting, and was confined to his bed for some days with a cough, pain in the chest, with severe expectoration; for this he was treated in the ordinary way, with bleeding, blistering, &c., which relieved him very much from the more urgent symptoms; still the cough remained, being much worse during the last winter. On percussing the chest, there was evident dulness under the left clavicle, with some resonance of the

voice in this part: the respiratory murmur was rather indistinct here, and the healthy relations between the inspiratory and expiratory murmurs did not exist. I put him under treatment, and after some time there was an evident improvement in the case; the tuberculous infiltration of the left lung began obviously to diminish, and he began evidently to gain flesh and strength; he again returned to his ordinary employment, and again resumed the use of spirits, the effect of which, after some time, was to induce all the bad symptoms: his cough again became severe; the sputa were occasionally tinged with blood; a cavity became developed in the apex of the left lung; the tuberculization went on in this lung, extending downwards; hectic fever set in, and the patient sunk at length.—There never was a case wherein the curability of consumption was more clearly demonstrated than this. When first the patient came under treatment, he evidently had tubercular deposition in the left lung, as evidenced by dulness on percussion, bronchial respiration, resonance of the voice, with subversion of the normal ratio between the inspiratory and expiratory murmurs. These signs were removed by treatment;

and it is more than probable that, had the patient adhered to the prescribed regimen, he would have lived many years.

CASE VI.

A naval officer, who had seen much service, and had been exposed to various vicissitudes of climate, complained some time since, on returning home from a voyage to India, of cough, night sweats, and muco-purulent expectoration; the cough had been on him, more or less severely, for a month or six weeks before his return home; he had been before this attack in the enjoyment of robust health, but had been, for the last few years of his life, addicted to the use of ardent spirits, after which his digestive powers became somewhat deranged; he lost flesh; did not sleep as well as usual; bowels became irregular, sometimes being relaxed, and sometimes costive, with other symptoms of deranged nutrition and digestion. When I saw him, he complained of a feeling of tightness and slight pain in the upper part of the chest; he was also somewhat hoarse; had spit blood twice or thrice within the preceding fortnight; sound dull on per-

cussion in the right subclavicular region ; the vesicular murmur rather feeble in this same part, with bronchial respiration and resonance. Considering the habitual strength of the patient, and the recent nature of the attack, I adopted the use of small bleedings, applied a small blister to the subclavicular region, which I kept open for about three weeks ; removed the deranged state of the digestive functions, and employed such other means as might best eliminate from the system the tubercular matter which I had every reason to suspect was being formed in it. Prescribed strict attention to diet and regimen, and in the course of about two months from the commencement of my treatment, the respiratory and digestive apparatus were perfectly restored, all cough and other symptoms of an unfavourable character disappeared, and the patient, having gained his ordinary strength, was soon able to resume his usual employments.

*** The preceding cases have been selected from a number of a similar character.

T. C. Savill, Printer, 107, St. Martin's Lane.