THE

HISTORY, DIAGNOSIS, AND TREATMENT

OF

TYPHOID AND OF TYPHUS FEVER;

WITH AN ESSAY ON THE

DIAGNOSIS OF BILIOUS REMITTENT

AND OF

YELLOW FEVER.

"All diseases, then, ought to be reduced to certain and determinate kinds, with the same exactness as we see it done by botanic writers, in their treatises of plants. For there are diseases that come under the same *genus*, bear the same name, and have some symptoms in common, which, notwithstanding, being of a different nature, require a different treatment. . . . . In writing, therefore, a history of diseases, every philosophical hypothesis, which hath prepossessed the writer in its favour, ought to be totally laid aside, and then the manifest and natural phenomena of diseases, however minute, must be noted with the utmost accuracy, imitating in this the great exactness of painters, who in their pictures copy the smallest spots or moles in the originals."—*Sydenham.*

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TO

JAMES JACKSON, M. D.

OF BOSTON,

LATE PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN HARVARD UNIVERSITY,

AND TO

W. W. GERHARD, M. D.

OF PHILADELPHIA,

LECTURER ON CLINICAL MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA,

This history of two diseases, many points of which, they, especially, amongst his own countrymen, have diligently and successfully studied and illustrated,

THIS VOLUME IS RESPECTFULLY INSCRIBED,

BY THEIR PERSONAL FRIEND,

THE AUTHOR.

September 1st, 1842.

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PREFACE.

I HAVE written this book, because I thought, that I saw a want in medical literature, which it might supply. Our science, so far as the great subject of idiopathic fevers is concerned, is passing through a transition period; and many authorities, that were received as standard and classical, only a few years ago, are fast becoming obsolete; at least for American readers. This is particularly true of the leading English treatises on Fever. Neither the works of Fordyce, Armstrong, Southwood Smith, nor Tweedie; nor the elaborate articles on Fever, in the Medical Cyclopedias, Libraries and Dictionaries, can henceforth be regarded as sufficient, or even safe, guides for American practitioners; and the remark is applicable to them, not because they are not works of great excellence and value; but for other reasons, which will be abundantly obvious in the course of the following pages.

I may simply say, here, that their authors describe, principally, a fever, or form of fever, which is rarely met with in this country; and that they do not represent the actual state of our knowledge upon this subject. It must be regarded as especially unfortunate, that, until within a few years, the greater part of our information, relating to continued fever, has been derived from writers, who have treated, mostly, and under the same name as that generally used by ourselves, of a disease, or form of disease, differing, in many important respects, from that which is most common with us; and, that, in this way, so great a degree of confusion has been introduced into our notions of fever.

If the radical defect in our literature of continued fever, thus indicated, had not existed; and if the histories of the disease, which have been given to us by Louis, Chomel and Andral, amongst the French; and by Nathan Smith, Dr. James Jackson, Dr. Hale, and some others, amongst ourselves, were generally accessible, and generally read, there would have been no want such as I have alluded to; and, certainly, I should not have added another to the long catalogue of books on fever. A translation, by Dr. Bowditch, of Louis's *Researches,* was published a few years ago under the auspices of the Massachusetts Medical Society, and has since been in the hands of most of its Fellows. But it is very far from being so generally and thoroughly known as it deserves to be. I may add, that the character of this remarkable work is

hardly adapted to the actual wants and tastes of the great majority of our practical men. I may say this, I think, without any risk of giving offence; for no man's admiration of this work can be more unqualified and profound than my own. Constituting, as it does, one of the few imperishable monuments, that have, from time to time, and at distant intervals, been raised up along the pathway of our science; it is, nevertheless, true, that in the present state of the profession in this country; amidst the daily cares and duties of its active members, there are but few, who will devote to this object the time and the labor which are necessary, thoroughly to comprehend its principles, and to master its accurate and minute details. Chomel's *Clinical Lectures*, so far as I know, have not been published here; Nathan Smith's *Essay*, excellent as it is, is still very incomplete; and the *Reports* of Dr. Jackson and Dr. Hale, besides not professing to treat systematically of the disease, are not generally accessible.

These, in brief, are the reasons, which have prompted me to undertake the preparation of this treatise. I thought, that the wants of medical science, here at least, demanded a history and comparison of the two chief forms of continued fever, as they are now ascertained to exist, fuller and more discriminating than had yet been written; and these wants I have endeavored to supply. My book aims at no other excellence, and no higher merit, than that of being a methodical and com-

pendious summary of the actual state of our knowledge upon two most common and most important diseases. If it has reached this excellence, and if it possesses this merit, I am satisfied.

I have only to add, in conclusion, that one of my leading purposes has been to bring out more clearly and strongly than has hitherto been done, our means of diagnosis between the different species or forms of fever; and to ascertain and establish their nosological relations. It cannot be necessary to go into any formal vindication of the importance of this diagnosis. Setting it aside, altogether, as a matter of science; it is the first, essential condition of all sound practice. In the following history it will be noticed, that I have spoken of no individual fever, excepting the four, which are more or less fully described; to wit, Typhoid Fever; Typhus Fever; Periodical Fever, in its three forms, of Intermittent, Bilious Remittent, and Congestive; and Yellow Fever. The simple reason of this is, that I do not know anything of any other distinct fever amongst us. There may be such a disease as the Simple Fever of Fordyce, or the Ephemera of many writers. I know, that adults, sometimes, in consequence of great, or protracted, fatigue; and, that children, still oftener, from inappreciable causes, are attacked with headache, loss of appetite, debility, and general febrile excitement, not referable to any local origin; which symptoms, after rest of from one to two or three days, either with or without medicine, usually

subside, leaving the individual in good health. But whether this kind of disorder should be looked upon as a distinct, established form of fever, seems to me, to say the least of it, very doubtful. As to an Inflammatory Fever distinct from Typhus or Typhoid Fever, I can only say, with Nathan Smith, and Chomel, that I have no knowledge of any such disease.

SEPTEMBER 1st, 1842.

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THE

HISTORY, DIAGNOSIS, AND TREATMENT

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PART FIRST.

TYPHOID FEVER

CHAPTER I.

PRELIMINARY MATTERS.

ARTICLE I.

INTRODUCTORY.

In writing a history of typhoid and of typhus fever, I begin with that of typhoid fever, for three reasons.

In the first place, my own knowledge of the disease, derived from personal observation, is much better than it is of typhus fever. My attention was early and strongly called to its investigation by the remarkable work of Louis upon the same disease, as it shows itself in Paris. My professional life, thus far, has been passed in the midst of a population, especially exposed to some of its predisposing causes, and amongst whom, it has, very constantly, and at times very extensively, prevailed; so that a personal acquaintance with this fever of fifteen years' continuance has given me sufficient opportunity to become somewhat familiar with its char-

acter; more so, at any rate, than with the remaining diseases, which I propose, in part, at least, to describe.

In the second place, there is good reason to think, that typhoid fever is more generally and extensively prevalent, in various parts of the world, than the other distinct forms of essential or idiopathic fever. This is a point which requires further and more accurate observation for its settlement; but it is pretty certainly true of the temperate latitudes of Europe and America. The actual extent of its prevalence will be more fully spoken of hereafter.

In the third place, typhoid fever has been more minutely, more accurately, more thoroughly studied, than any other distinct form of essential or idiopathic fever. Although a complex, and in many respects, an obscure disease, its diagnosis is, in most cases, easily and positively made out. Its natural history has been very fully investigated, and the results of this investigation faithfully recorded and summed up. Its symptoms, its lesions, its causes, so far as these latter are appreciable, have been very exactly ascertained and settled; and they have been very patiently compared with the symptoms, the lesions, and the causes of other diseases. This more complete knowledge of the disease renders it a very convenient starting point, and an exceedingly valuable standard of comparison, in our subsequent study of other forms of fever, more or less related to this, but whose history and character have not been so definitively and precisely established.

These, very briefly, are the simple and obvious considerations, which induce me to commence this history with a description of typhoid fever.

ARTICLE II.

NAMES OF THE DISEASE.

I have adopted the term typhoid fever as the name of this disease, simply because it is not particularly objectionable, and because it seems to be coming into general use. It is that which is most commonly given to the disease by the French, although many of their writers have coined other, and as they think, more appropriate appellations. Petit and Serres described it in 1813, under the name of entero-mesenteric fever. This term, as has been observed by Andral, has the advantage of marking the peculiar lesion of the disease, while it is free from the objection of pre-judging, by any implication, its nature or character. Bretonneau calls it a *dothinenterite*, from the pustular inflammation of the intestine. Cruveilhier and others have applied to it the name of follicular enteritis. By the Germans it is commonly called abdominal typhus. In New England it has generally been known under the name of typhus or typhous fever; and by the great majority of practitioners it still continues to be so designated. Since, however, it has been ascertained, that the disease differs, in many important respects, from the typhus of British writers, it has become manifestly necessary to apply to it some

other appellation, and in conformity to the example of Louis, Gerhard, Jackson, and others, I have chosen that of typhoid fever.

It may be well to say a word here in regard to the identity of the continued fever of New England with the typhoid fever of the French pathologists. This identity is very clearly and positively settled. No one familiar with the disease, as it shows itself in Paris, and as it is described by Louis, Chomel, and Andral, and who reads Nathan Smith's description of the *Typhous Fever* of New England, can doubt for a moment, so far as the symtomatology is concerned, that such is the case. The identity of the pathological lesions in the fever of the two countries has been more recently established. Dr. E. Hale, Jr., of Boston, published in the Medical Magazine for December, 1833, an account of three dissections of persons, considered by him to have died with this disease. If the diagnosis in these cases could be looked upon as certain and positive, they would constitute, so far as I know, the first published examples of the intestinal lesion of the disease, as it occurs in New England. The diagnosis, however, in all the instances, must be regarded as somewhat doubtful, and the alteration of the intestinal follicles does not seem to have been very clearly or strongly marked. The first authentic and unequivocal cases on record, that I have been able to find, are two, which were published by Dr. Gerhard, in the American Journal of Medical Sciences, for February, 1835. In the Medical

Magazine for June, 1835, I gave a short account of the entero-mesenteric alterations in five cases of unequivocal typhoid fever, which alterations corresponded exactly to those described by Louis. I have upon my note book the anatomical history of two similar cases, which occurred during the months of January and February, 1833, but which were never published. Dr. James Jackson, Jr., then a medical student, observed the intestinal lesion in a clear case of the disease as early as October, 1830, although the account of the observation was not made public till 1835.[1] Dr. Jackson, Jr., after having studied typhoid fever in Paris, aided and guided by the personal instructions of Louis, again saw the disease in Boston, and in two cases, one of which occurred in 1833, and the other in 1834, he found the characteristic lesion of the intestinal follicles and mesenteric glands. An account of these observations was published in 1835. Dr. Jackson, Sen., in his Report on Typhoid Fever, communicated to the Massachusetts Medical Society in June, 1838, says, that the alteration of Peyer's glands had been noticed at the Massachusetts General Hospital, previous to 1833, in cases which were carefully examined. Since the periods above referred to, more extensive and accurate observations, by Dr. J. Jackson, Dr. Hale, Dr. Bigelow, Dr. Bowditch, Dr. J. B. S. Jackson, Dr. Shattuck, Jr., Dr. Holmes, and others of Boston; and by Dr.

[1] Memoir of James Jackson, Jr., p. 222, *et seq*

Gerhard and Dr. Stewardson of Philadelphia, have uniformly sustained the correctness of these early conclusions, and demonstrated the entire identity of the typhoid fever of Paris and of the United States.

ARTICLE III.

METHODS OF DESCRIPTION.

There are two methods, either of which may be adopted, in the description of a disease. One of these, and that which, with a few exceptions, has been in universal use from the time of Hippocrates to the era of Louis, consists in a general enumeration of the more striking and obvious phenomena of the disease, in their various combinations and progress, constituting a kind of portrait or picture. The other, which has been followed by many writers within the last fifteen years, especially amongst the French, consists, not merely in this general enumeration of the phenomena, their combinations and progress; but in a thorough and careful analysis of these phenomena; in a special and particular study of each individual element, which goes to make up the disease; and in a strict estimate of the relative value and importance of each and all of these several elements. This analytical process, this "searching operation," is applied in study as well as in description, not only to the symptoms of a disease, but, to a considerable extent, also, to its pathology, etiology and therapeutics. Amongst the best examples of the first method, the physiog-

nomical portraiture of disease, may be mentioned Sydenham's description of measles and St. Vitus's dance, and Dr. Ware's description of delirium tremens. The first and one of the most perfect examples of the latter is to be found in Louis's Researches upon Phthisis, published in 1825.

Each of these methods has its advantages and its disadvantages, its excellencies and its defects. By the first, a more complete and integral picture of the disease is presented, at once, to the mind, than can be done by the second. We are enabled to see, at a single glance, the form, the outlines, the features, the physiognomy of the disease. But in many very important particulars, this method is inferior to the second. It is merely a picture of disease; like all other pictures, more or less like the original, strongly or feebly colored, according to the peculiar taste or ability of the individual artist. It is necessarily wanting in the scientific accuracy of which the second is susceptible. It is less complete, less perfect. The disadvantages of the latter consist in the absence of that wholeness and unity of impression which are made by the former. The mind, in order to get at the integral and entire picture, must arrange and combine the scattered materials, which it has studied separately. As one of the leading purposes of the present work is to point out, as far as our actual knowledge will enable us to do so, the characteristic features of each of the two great forms of continued fever; to establish, as far as possible, a clear and positive

diagnosis; to ascertain the resemblances and the differences between them; I shall rely almost exclusively upon the last mentioned method.

CHAPTER II.

SYMPTOMS.

ARTICLE I.

MODE OF ACCESS.

There is a good deal of difference, in different cases of typhoid fever, so far as the suddenness or violence of the seizure is concerned. There is no other acute disease, perhaps, in which the attack is more frequently slow and gradual than in this. In many cases it is quite impossible for the patient to fix with any accuracy upon the day when his fever commenced. Neither, in many of these same cases, is he able to tell in what his sickness consisted. He can only say, that, for several days, he has not enjoyed his accustomed degree of health. He may have merely felt a sensation of mental and bodily languor, an indisposition, or an inability to accomplish his usual labor, either of mind or body. He may have had slight and dull pain in the head, or in the back and limbs, with a general feeling of soreness or of fatigue. At the same time he may have experienced some sensations of chilliness, alter-

nating with heat. There may have been, also, diminution, or loss of appetite, moderate thirst, with a dry or clammy state of the mouth. The expression of the countenance sometimes becomes listless and dull, the eye loses its animation, and the mind is either indifferent or apprehensive. There may have been moderate diarrhœa with some pains in the abdomen. This obscure and indefinite condition of ill health may continue for more than a week, occasionally for two or three weeks even, with but slight changes from day to day. Oftentimes there is a slow but steady increase in the severity of these morbid sensations, with a like gradual but regular appearance of other and more characteristic symptoms of the disease, these latter coming out, day by day, one after another, a complete and successive development of the peculiar and strongly marked phenomena of the disease. In other cases, after an indefinite continuance of this obscure precursory period, there is a sudden supervention of the more violent symptoms. Nathan Smith says, "the disease attacks in such a gradual manner that we hardly know on what day to fix its commencement."[1] Dr. James Jackson says, "there is more difficulty, perhaps, in ascertaining the commencement in cases of typhoid fever, than in many other acute diseases."[2]

In a certain proportion of cases, however, precisely how large, I am not able to say, the access

[1] A Practical Essay on Typhous Fever. By Nathan Smith, M. D.

[2] Report on the Typhoid Fever. By James Jackson, M. D.

of the fever is more violent, and its period much more distinctly marked. Chomel, indeed, says, that most frequently the invasion is sudden, coming on in the midst of perfect health, unexpectedly, and not preceded by any precursory symptoms. Of one hundred and twelve cases, in which this point was exactly observed, the access was sudden in seventy-three; in the others there were obscure, premonitory symptoms. The mode of attack, in these cases, is various; most frequently, perhaps, by a chill, accompanied by debility and head-ache, and followed by heat and thirst. In other cases, the mode of attack is different. During a grave epidemic of typhoid fever, which prevailed in the city of Lowell, in the winter of 1834-5, I saw two cases, in which the first feelings of ill health, experienced by the patients, so far as could be ascertained from them, consisted of severe, griping pains in the bowels, accompanied with tenderness on pressure. In these cases, diarrhœa was an early and prominent symptom. In another, and that a fatal case, the patient had been at her usual work during the day, and on getting into bed at night, felt *lame*, this being the first feeling of sickness of which she was conscious. But, whatever be the mode of attack, whether this be slow, insidious, creeping and obscure, marked by no obvious and prominent symptoms, or, on the other hand, sudden and violent, — in either case, the disease goes on, for a considerable period of time, varying, of course, according to its severity and its favorable or fatal ter-

mination; during which progress it is characterized by a greater number and variety of symptoms; in themselves, in their combinations, and their successive appearance, peculiar to this fever, than are to be found in any other form of acute disease. These several symptoms, classified and arranged, I now proceed to describe, as fully and faithfully as the present state of our knowledge will enable me so to do.

ARTICLE II.

FEBRILE SYMPTOMS.

Sec. I. — *Chills.* Like most acute diseases, typhoid fever is attended by chills or rigors. These are, generally, not very severe. Dr. Jackson says, that in the Massachusetts General Hospital, rigors were much less frequent than chills. Nathan Smith observes, merely, that in the commencement there is, generally, some degree of chilliness felt by the patient. Of thirty-three fatal cases, cited by Louis, thirty-one had chills; in one fourth of which number they were severe, accompanied with trembling. Of forty-five grave cases, recovered, all were marked by chills, excepting three; and of thirty-one mild cases, there were chills in twenty-four.

This symptom, in a great majority of instances, is present at the commencement, or very early in the disease. It is one of the most constant attendants upon the formal access of the fever. The

chill occurs oftenest in the course of the day, and in a large proportion of cases is repeated, more or less frequently, during the early period of the disease. It is not less constantly present in cases amongst children than it is amongst adults.

Sec. II. — *Heat and State of the Skin.* Following the chill or rigor, and in the intervals, when these are repeated, there is, almost always, increased heat of the skin. This heat varies very much in different respects. In many patients it is quite moderate in degree, and pretty uniformly diffused over the body. In others the morbid heat is high and burning, and not unfrequently very unequally distributed. Nathan Smith says, "sometimes the head and trunk will be excessively hot, while the extremities are cooler than natural; at others, the extremities will be preternaturally hot, when the body is but moderately so. One cheek will often appear of a deep red color and be very hot, while the other remains pale and cool; as its color and heat subside, they seem to cross over and affect the opposite cheek in the same manner. This color and heat usually extend so far as to include the ear of the affected side." In the latter stage of grave and fatal cases, the intensity of the morbid heat frequently diminishes, and in mild cases it is not often very high, even in their early periods.

This morbid heat, as one of the elements of the exacerbations, or fever fits, is subject to frequent variations in the course of each day. In grave

cases these are of very constant daily occurrence. Sometimes they are irregular in their appearance, coming on at different and uncertain times of the day, although more commonly there are two each day. In the early period of the disease the most strongly marked exacerbation is usually in the afternoon. During these fever fits, there is increased redness of the cheeks, acceleration of the pulse, and a general aggravation of the severity of all the uncomfortable and painful sensations.

The state of the skin, in regard to dryness and moisture, is quite different in different patients. In a small proportion of severe cases, the skin is almost constantly dry during the whole course of the fever. In others there is more or less moisture. Sometimes the sweats are limited to a short period following the evening exacerbation, or they break out in the night, during sleep. Not unfrequently they are profuse, sometimes confined to certain portions of the body, at others extending over the whole surface. Chomel says, that they often exhibit a strong acid odor. Louis observes that the sweats are in no degree proportionate to the morbid heat, and that not unfrequently they are prolonged during convalescence, preventing the re-establishment of the strength, and resisting the influence of aromatics and bitters. Nathan Smith speaks of "what has been called the *washer-woman's sweat*, which is extremely profuse over the whole surface of the body and extremities; standing in large drops on the face, and giving to the cuticle, on the palms of

the hands and soles of the feet, a corrugated appearance and a light color, as if it had been long macerated in water. In such cases, the perspiration is warm till a short time before the patient expires." He never saw an instance of recovery after this kind of sweating.

Dr. Smith also says, "there is a remarkable odor arising from a person affected by this disease, so peculiar that I feel assured that upon entering a room, blindfolded, where a person had been confined for some length of time, I should be able to distinguish it from all other febrile affections." My own experience, in this matter, coincides with that of Dr. Smith. This odor, which is not pungent and ammoniacal, like that which is said to arise from the bodies of patients with the grave forms of the British typhus, but of a semi-cadaverous and musty character, I have frequently noticed, especially during the late stages of severe and fatal cases.

After recovery, when the case has been one of considerable severity, the cuticle often peels off, in large flakes, from the palms of the hands and the soles of the feet; the hair, also, frequently falls off from the head, and is succeeded by a new growth.[1]

Sec. III. — *Pulse.* The circulation is nearly always accelerated; and, in many cases, otherwise modified. The frequency of the pulse, during the

[1] Nathan Smith. On Typhous Fever.

whole course of the disease, may be said to range between 70 and 140 in the minute. As a general rule, the frequency of the pulse is in proportion to the severity and danger of the disease. The pulse is considerably more frequent in female than in male patients. Dr. Jackson's Report contains some interesting results in regard to this subject. He found that in the cases which terminated favorably, the average, least frequent pulse was 74.16, and the average, most frequent pulse, 102.68 : while in the cases, which terminated fatally, the average, least frequent pulse was 91.88, and the average, most frequent pulse was 129.29. Amongst the fatal cases, in the males, the average, least frequent pulse was 85.50, the average, most frequent pulse, 124.29 ; while amongst the fatal cases, in the females, the average, least frequent pulse was 106.64, and the average, most frequent pulse, 138.58. With the establishment of convalescence, the pulse, generally, though not always, approaches its healthy standard of frequency.

The other variations in the character of the pulse are not susceptible of such definite statement as those of its frequency, but they are still, in many cases, very obvious. Sometimes, especially in mild cases, where the circulation is only moderately accelerated, the pulse preserves its natural softness and volume. This is never the case where it is very frequent. The pulse is then sometimes sharp and jerky, generally small, and pretty easily com-

pressed, and not unfrequently, undulating, or *bis-feriens.*

Distinct intermissions and irregularity of the pulse are not very common, although they occur in a moderate proportion of very grave and fatal cases. Louis thinks that this modification of the pulse is generally connected with a secondary affection of the heart.

ARTICLE III.

THORACIC SYMPTOMS.

Sec. I. — *Respiration.* Modifications in the character of the respiration are not often mentioned amongst the phenomena of typhoid fever; but they are of pretty frequent occurrence, and some of them are deserving of particular notice. The most common alteration of the breathing consists simply in the usual acceleration which accompanies febrile excitement. Under certain circumstances, however, there is a more marked and peculiar change in the character of the breathing. In high grades of the disease, and particularly in its later stages, accompanied, invariably, or nearly so, by delirium or stupor, the respiration becomes irregular, noisy and hissing. Nathan Smith speaks particularly of this peculiarity of the breathing. He says, "After the patient has been sometime sick, if the disease proves severe, there is a peculiar whistling sound produced when he breathes through the nose; and

when asleep, or lying in a state of coma, the mouth is generally kept open, and the breathing has somewhat of a stertorous sound." I do not think that this irregular, noisy, sibilant respiration depends, in any degree, upon disease of the lungs. It is, manifestly, connected with and dependent upon a morbid condition of the brain.

Positive dyspnœa is not very common. It occurs, of course, where there is extensive secondary disease of the lungs, and sometimes it is occasioned by excessive tympanitic distension of the abdominal parietes.

Sec. II. — *Cough.* Typhoid fever, in a large majority of cases, is attended by cough. This is generally slight, and hardly attracts the attention of the physician or the patient. According to Louis it most commonly commences between the fifth and the fifteenth day of the disease. The sputa are usually small in quantity; sometimes tenacious and colorless, sometimes bloody, simply from an admixture with blood from the nares, and sometimes rusty from a complication of pneumonitis.

Sec. III. — *Physical Signs.* The most constant and characteristic of the physical signs, connected with the thoracic organs, consists in a dry, sonorous or sibilant rhonchus. This, in many cases, is very loud, and heard universally over the chest; its extent and severity altogether disproportionate to the dyspnœa. Louis was the first, I think, who

noticed, particularly, this sign in typhoid fever. It appears early in the disease. Late in the fever, especially near the close of cases about to terminate fatally, there is often a circumscribed crepitous rhonchus, with other physical signs of local, secondary pneumonitis. Occasionally, instead of the dry, sonorous or sibilant, there is a humid or mucous rhonchus.

ARTICLE IV.

CEREBRO-SPINAL, OR NERVOUS SYMPTOMS.

Having completed the detail of symptoms, to which the term febrile is more particularly applied, and which, with certain modifications and peculiarities, are common to all essential fevers, to all acute inflammatory diseases of considerable extent or severity, and to very many chronic, organic alterations, I now proceed to the description of another very extensive group of phenomena, consisting in disturbances of the functions of the nervous apparatus. These disturbances occupy a very important place in the natural history of typhoid fever, and serve, to a very considerable degree, to distinguish it from nearly all other forms of disease.

Sec. I. — *Headache.* Pain in the head is amongst the most constant symptoms of the disease. It is, indeed, very rarely absent. Louis says, that of eighty-seven cases, in which the patients recovered, there was headache in all but

three. It is as common an accompaniment of mild as it is of severe cases.

This pain is amongst the earliest symptoms. In many cases it is the first thing which arrests the attention of the patient, and marks the formal access of the fever. Chomel says that this occurs most frequently on rising in the morning. Sometimes it comes on after the third or fourth day. Its duration is various; but, very generally, after a longer or shorter period, it gradually diminishes in severity and finally disappears. In severe cases, which recovered, Louis found its most common duration to be from eight to ten days.

The character and degree of this pain are various. Most frequently, it is dull, heavy, or throbbing, not occupying very much the attention of the patient. In a few cases it is intense and acute, occasioning great distress. It is generally continuous, although its severity may be increased during the febrile exacerbations. It is less severe in mild than in grave cases. Now and then it is the most prominent and importunate symptom during the whole course of the disease. It occupies, most frequently perhaps, the forehead and temples, but it often extends over the whole head. It is not unfrequently accompanied with some soreness and stiffness of the eye balls, felt on pressure and on motion.

This symptom is generally present in children. Taupin says that the pain is almost always confined to the frontal region. It is heavy, and not very acute.

SEC. II. — *Pains in the back and limbs.* In many cases the headache is attended with pains in the back and limbs. These pains, I think, are more constant and distressing in the legs than in the arms. They go off with the headache, and frequently, indeed, before the disappearance of the latter.

SEC. III. — *State of the Mind.* I have already remarked, in speaking of the mode of access of typhoid fever, that one of the earliest and most constant phenomena consists in mental languor or inability. The patient is sometimes impatient and irritable, but, more frequently, listless and indifferent, or perhaps timid and apprehensive of the danger of the approaching disease. He finds it difficult to fix his attention, or to pursue his accustomed train of thought. He is forgetful, and does not measure the lapse of time with his usual readiness and accuracy. This condition of the mind, in cases of moderate severity, may continue through the entire course of the fever, up to the period of convalescence. In graver and fatal cases, it is generally lost either in delirium or stupor.

Delirium is a common symptom of typhoid fever. Its frequency and degree are in pretty direct proportion to the severity and danger of the disease. Of forty-six fatal cases, cited by Louis, there was delirium in thirty-eight. In two of these the delirium was of short duration, and in two others it was present only during the last two or three days

of life. But it should also be remarked that seven of these cases were fatal from perforation of the intestine; and that this accident most frequently occurs in cases of moderate severity. I have seen the disease, in its worst form, terminating fatally in the course of the second week, without any delirium, but this is, certainly, not a common occurrence. Of Louis's fifty-six grave cases, terminating favorably, thirty-nine were marked by delirium; while of thirty-one mild cases, there was delirium in only three, and even in these few it was mild in its character and of short duration.

In a small number of cases this symptom is present at the commencement, or very early in the disease. Generally, however, it comes on in the course of the first or second week of the fever. As a general rule, it appears early in proportion to the gravity and to the rapid progress of the disease. Its march and duration are various. In fatal cases it rarely disappears, after its occurrence, till it is lost either in coma or death. In grave cases, which recover, it goes off with the approach or commencement of convalescence, its subsidence or diminution constituting one of the earliest and surest signs of this desirable event. In many cases, especially of a mild or moderate character; and for the first few days, after its appearance, even in severe cases, it is present only during the night, or in the febrile paroxysm, or, perhaps, for a transient period immediately after waking. Under such circumstances, the patient can be called back from his incoherent

wanderings, and by exciting and holding the attention, his mind kept steady and clear. As soon, however, as this external excitement is withdrawn, the mind at once lapses into its disturbed and irregular action.

The delirium is generally of the kind to which the terms *low* and *muttering* have been applied. In many cases, however, and especially in such as are rapid in their march, and of great severity, the delirium is attended with wild and violent agitation. Sometimes the patient is in constant and restless motion in his bed, picking at his bed clothes, or pulling them about, and frequently drawing them tightly over his head. Sometimes he rises suddenly from his bed, when if not restrained he will sit upon its side, or wander, aimless and incoherent, for a few moments, about the room. In these cases, the agitation is so violent, that it requires the constant presence of attendants, and occasionally no slight degree of force, to keep the patient in his bed. This violent delirium is often attended, also, with cries and screams, particularly during the night.

Distinctly monomaniacal delirium is very rare, although it is seen, occasionally, after the active period of the disease has gone by. Louis alludes to some cases, where in the midst of the most dangerous symptoms, the patients declared that they were very well. He says, that he has never known a patient, under such circumstances, to recover. The restoration of the healthy action of the mind,

on recovery, is more or less gradual, but nearly always complete. Nathan Smith says, that in some instances it appeared to him that the moral principle was affected after recovery. He speaks, particularly, of a young man, who, after recovery from a grave form of the disease, had a strong propensity to steal. After repeated thefts, some of them from a young man to whom he was under great obligations, and who had nursed him during his sickness, he was detected and punished. His character before his illness had been good. Dr. Smith says, also, that, after recovery, the whole time that has elapsed, and all the events that have taken place during the fever, are entirely blotted out from the memory and are never after recovered. This may be true to a certain extent, but not without many exceptions and qualifications. Louis says, in his second edition, that since the publication of his *Researches*, he has seen three hundred cases of typhoid fever, and that in only one was there any morbid condition of the mind remaining after the establishment of convalescence. According to Rilliet, delirium rarely shows itself in children before the fifteenth day of the disease.

Sec. IV. — *Physiognomy.* The expression of the countenance is strongly marked and peculiar. Very generally, even in cases of moderate severity, it is dull, listless and vacant. The eye is heavy and languid. The indifference, sluggishness and apathy of the mind are strongly painted on the

face. If there is much suffering, either from pain, or, as more commonly happens, from the indefinite and indescribable restlessness of fever, the usual heavy and stupid expression of the countenance is mixed with or supplanted by one of sadness, anxiety and distress. In many very mild cases, there can hardly be said to be any other change in the look, than a notable diminution of its animation and quickness.

Sec. V. — *Somnolence.* In most cases, preceding the delirium, and often alternating with it after its appearance, there is more or less drowsiness or stupor. This symptom makes its appearance early in proportion to the intensity and to the rapid march of the disease. Louis found it present in nine-tenths of his fatal cases. When the fever was of a mild character, he noticed it in a little more than half the cases, and in these it was later in its access, slight in degree, and brief in its continuance. In fatal cases, it generally persists and increases, after its first appearance, unless when interrupted by violent delirium, until it ends in complete coma, or is lost in death. Where the fever terminates favorably it gradually subsides, and, like the delirium, finally disappears with convalescence.

Dr. Jackson found, that in the Massachusetts General Hospital, it occurred in 1 case in 3.81 amongst those which terminated fatally, and in 1 case in 7.25, only, amongst those which terminated favorably.

Sec. VI. — *Vigilance.* There is an opposite condition, that of prolonged and obstinate watchfulness, which is common in typhoid fever. This distressing symptom, interrupted, perhaps, occasionally, by a transient, disturbed and unrefreshing slumber, is more common in the early than in the late periods of the disease, and is much more frequently present in grave than in mild cases. It is often associated with restlessness or delirium.

Sec. VII. — *State of the Senses.* Amongst the alterations in the functions of the senses, the most common are dizziness, ringing in the ears, and dullness of hearing. The first of these is often felt amongst the precursory symptoms, before the patient has taken to his bed, and it occurs subsequently, especially on his attempting to assume an upright position. Ringing or buzzing sounds in the ears are present, mostly in the early or middle period of the disease, in a majority of severe cases. In mild cases they also occur, but less frequently. Dullness of hearing was noticed by Louis in two-thirds of his fatal cases, and in thirty-three of forty-five grave cases terminating in recovery. It is somewhat less common where the fever is moderate. It appears earlier than the *tinnitus aurium*, and is not unfrequently followed by this latter sensation. Nathan Smith says, in his description of the disease, "the hearing is often impaired, almost from the commencement of the attack. Sometimes false hearing occurs, and the patient imagines

he perceives voices and sounds when nothing of the kind exists."

The eyes and their functions are more rarely affected. If there is active febrile excitement, there is often increased sensibility to light, mostly in the early stage of the disease. In a considerable proportion of cases there is some injection and redness of the conjunctiva. This occurs in the later periods of the disease, and is commonly accompanied with a viscid secretion, rendering the edges of the lids more or less adherent to each other. This state of the eyes is particularly spoken of by Dr. Smith.

Imperfect and perverted vision occurs occasionally, but it is not common. Like the dizziness and ringing in the ears, this not unfrequently comes on temporarily, when the patient sits up in his bed.

The sense of taste, as might be expected from the state of the tongue and the loss of appetite, is either dull or perverted. Chomel speaks of patients who chewed without repugnance, pills composed of medicinal substances, which were very disagreeable during health.

The general cutaneous sensibility is not often affected to any considerable extent. The feeling of soreness, occurring in the access of the disease, which has already been mentioned, appears to have its seat rather in the muscles than in the skin.

Sec. VIII. — *State of the Muscles.* Irregular spasmodic contractions, or permanent rigidity of

certain muscles, occur in a moderate proportion of cases of typhoid fever. The most common are those of the fingers and wrist, to which the term *subsultus tendinum* has been applied. Sometimes they affect the muscles of the face or that of the diaphragm, occasioning hickup. Wherever they are seated, they are generally present in the late stages, and near the close of the disease. They are much more common in grave and fatal cases than in those of an opposite character. Louis found them present, in some form, either that of spasms or permanent rigidity, in one-third of his fatal cases, while of fifty-seven cases, somewhat severe, but terminating in recovery, there were spasms in only six. Of Dr. Jackson's cases, *subsultus tendinum* was noticed in 1 of 3.36, which were fatal, and in 1 of 10.03, which recovered. Permanent contraction of the muscles, generally of those of the arm, is almost invariably confined to cases which are about to end fatally. Dr. Jackson reports one instance of this kind, which terminated favorably.

One of the most constant and characteristic phenomena of typhoid fever consists in prostration of the muscular strength. In very many cases this is extreme, even in the early periods of the disease. A great majority of patients take to their beds at the beginning of the disease, and remain there almost constantly until the commencement of convalescence. They will suffer themselves to be placed passively in a chair, in order that their beds

may be made up and aired, but they are impatient and anxious to be returned as quickly as possible. When this prostration is extreme, unless there is great restlessness and distress, or delirium, the patient lies continually in the same position, on his back, entirely passive, with hardly sufficient strength to move his limbs. It is necessary for his attendants to raise him up in bed, and to hold to his lips the cup when he drinks. Conversation, addressed to him, is irksome and fatiguing, and he answers questions with reluctance and with a painful effort of his exhausted strength.

I have already remarked, that this feeling of debility is early in its appearance. Chomel says, that patients, in reply to the question put to them at the first visit, how they came to the Hotel Dieu, always answered, "in a carriage, or supported by two friends, for we were not strong enough to come alone on foot." In nearly all the fatal and grave cases, it is very strongly marked; in mild cases it is still present, but in a more moderate degree. Occasional exceptions are met with. Louis mentions instances, in which the patients kept about for a week, and even a fortnight, some of them continuing their accustomed occupations. Some of these were fatal cases. I have seen one striking instance of this character. The patient did not confine herself to the bed, until the occurrence of intestinal perforation.

This debility, when it is once present, rarely disappears or diminishes, until the close of the disease.

A slight increase of muscular strength, shown by turning for a short time upon the side, or by a disposition to sit a little longer than is necessary in the chair, is one of the first and most cheering indications of returning health.

ARTICLE V.

DIGESTIVE, AND ABDOMINAL SYMPTOMS.

I now come to the consideration of a group of morbid phenomena, not less extensive, various, and important, than those connected with the nervous apparatus. I allude to the symptoms consisting in disturbances of the entire complex function of digestion. These symptoms are more characteristic, indeed, of typhoid fever, than those which have just been described. We rely upon them, as one of our surest means of distinguishing between cases of this disease, and those of the analogous form of fever, which will next be described, under the name of typhus. For this reason, especially, as well as in accordance with the general plan and object of this history, I shall treat of them, particularly, and in detail.

Sec. I. — *Tongue and Mouth.* In a certain proportion of cases, the tongue is but slightly altered in its appearance, and this is true of the disease in all its grades of severity. Even in fatal cases, *if they terminate early*, that is, during the course of the second week, it not unfrequently happens, that

the tongue is merely covered with a light fur, and is not quite as moist as it is in health. When the disease is very mild, the tongue is often almost natural in its appearance, or covered only with a light, yellowish coat. At other times, under the same circumstances, it is smooth, moderately red, and moist with a tenacious, adhesive matter. This glutinous exudation is, indeed, very common, in all forms of the disease, the severe as well as the moderate. Besides this, there are other changes, which are found in a majority of cases, especially in those which are grave and protracted. Sometimes the tongue, having been covered with a light, or yellowish, moist coating, for a few days, gradually becomes dry and brown in a stripe along its middle, and red at its tip and round its edges. In other cases, or later in these, it becomes dark over its whole surface ; sometimes nearly black, glazed, stiff, and crossed by cracks and fissures. Sometimes this dark, dry crust peels off in flakes or patches, leaving the mucous membrane naked, red and shining. This process of coating and denuding may be repeated several times in the course of a severe and protracted case. In a small number of instances there is a whitish, apthous exudation upon the tongue, and also upon other portions of the mucous membrane of the mouth, like that which is often seen in the last stages of phthisis pulmonalis, and some other chronic diseases. It is generally found where the tongue is morbidly red, and only

at a late period of the fever, when there is great debility. In these cases, as well as in others, where there is a morbid redness, the tongue is not unfrequently swollen, painful and tender. Now and then it is the seat of ulceration.

The patient often finds a good deal of difficulty in protruding the tongue, particularly when it is dry, stiff and fissured, or covered with the tenacious secretion. Under these circumstances, even if the mind is sufficiently clear, and the will active, the tip and sides stick to the lips, and it is only after repeated efforts, that it is finally put out. Not unfrequently it is protruded with a tremulous motion.

The dryness and redness of the mucous membrane often extend to the different portions covering the posterior fauces, giving rise to more or less difficulty of swallowing, and to other disagreeable or painful sensations. The lips are also often cracked and covered with dry crusts, and the teeth, especially near the gums, are lined with a dark, tenacious sordes. The secretion of saliva is commonly scanty, and its quality changed.

Sec. II. — *Appetite and Thirst.* The desire for food is almost invariably absent, from the beginning to the end of the disease. The very idea of eating is offensive. A return of the appetite is amongst the earliest indications of recovery. The thirst is, in most cases, proportionate to the degree of febrile excitement. Sometimes, especially during the pa-

roxysm of fever, it is urgent. Cool drinks are commonly preferred, but not always.

Sec. III. — *Nausea and Vomiting.* A majority of patients with typhoid fever suffer more or less with gastric symptoms. The most frequent of these are nausea, vomiting, and epigastric distress. Of twenty-four fatal cases, mentioned by Louis, there was nausea in thirteen, occurring at various periods of the fever, and continuing for an uncertain length of time. Of twenty-three fatal cases, vomiting was present in twelve. Nausea not unfrequently occurs at or near the commencement of the disease; but vomiting takes place more frequently at a later period, especially when the matter ejected is of a greenish color and bitter taste, and when there is also present epigastric pain or distress. This combination of symptoms was first particularly noticed by Louis, and as I shall have occasion to say hereafter, was shown by him to be associated with a peculiar lesion of the stomach. Vomiting, at or near the commencement of the disease, is more frequent in cases of children than in those of adults.

Pain or distress in the region of the stomach, varying considerably in character and severity, is still more common than either nausea or vomiting. Finally, there are many instances, in which patients go through the fever without the occurrence of any one of these strictly gastric symptoms. In regard to this point, Nathan Smith says, "*sometimes*, nausea and vomiting take place. Sometimes, the mat-

ter thrown up consists wholly of vitiated mucus; at others, it is mixed with bile of an unhealthy color and consistence." [1]

Sec. IV. — *State of the Bowels.* Amongst the most frequent, and when taken in connexion with other phenomena, amongst the most characteristic symptoms of typhoid fever, is diarrhœa. This symptom varies very much in different cases, in regard to the period of its commencement, its degree, its duration, and so on. As a general rule, it is most common and severe in long-continued and grave cases, and least so in those of an opposite character. It was present in all but three of Louis's fatal cases. When the disease is mild, it is frequently wholly absent. It varies in severity from one or two discharges to twenty, or more, in the course of twenty-four hours. It commences at different periods of the fever. Of forty fatal cases, cited by Louis, in which this point was precisely ascertained, diarrhœa was present on the first day of the disease in twenty-two. In others it begun from the third to the fourteenth day.[2] In mild cases it is frequently wanting, and when present, commonly makes its appearance later in the disease, is less urgent, and of shorter continuance. It is commonly a protracted symptom in severe cases, its average duration, according to Louis, being nearly four weeks. Nathan Smith says, "the latter stage

[1] Smith's Medical and Surgical Memoirs, p. 64.

[2] Louis's Researches, vol. i. p. 464, 2d ed.

of all severe cases is attended with diarrhœa." In fatal and grave cases, late in the disease, the discharges are often involuntary, and wholly without the consciousness of the patient.

The stools are, generally, liquid, somewhat turbid, and of a yellowish color, in appearance not unlike new cider. In a considerable number of cases they are of a dark brown color. Their smell is fetid and offensive. Occasionally they contain portions of blood, and sometimes free and repeated hemorrhage takes place from the bowels. According to Dr. Jackson, this discharge occurred in the Massachusetts General Hospital in about one-tenth of the cases. It appears, from the researches of M. Taupin, to be less frequent in patients under fifteen years, than amongst adults. Louis says, that it is exceedingly rare to find any mucus in the dejections. A more exact estimate of the importance of this symptom, as well as of others, as a means of prognosis, will be made hereafter.

Dr. Hale, of Boston, thinks that diarrhœa is a more frequent symptom in the typhoid fever of Paris, than in that of New England, and the Report of Dr. Jackson seems to corroborate this opinion. This may be so, but I do not think that the data from which the opinion is derived are sufficiently accurate and positive to settle this matter. It seems very probable, that the records of the Massachusetts General Hospital do not always call that condition of the alvine evacuations, *diarrhœa*, to which the term is applied by Louis. It is true, at any rate, that such

is the case with the great mass of American practitioners. Certainly, as a general rule, they do not, as Louis does, apply the term *diarrhœa* to that state of the bowels, in which only one or two thin discharges occur in the course of twenty-four hours. In this way the apparent difference may, perhaps, be accounted for.

Sec. V. — *Abdominal Pains.* Pain in the abdomen is another very common accompaniment of typhoid fever. Its severity and frequency are in pretty direct relation to the severity of the disease and to the extent of the diarrhœa. Like the latter symptom the pains in the abdomen are often present at the beginning of the fever. At other times the pain appears at different periods of the disease. In some cases it is only elicited by pressure, but more frequently it is independent of this. It varies in severity from a dull heavy ache, or feeling of distress, to a severe, colicky griping. It is not often diffused over the whole abdomen, its most common seat being the iliac fossæ, the hypogastrium, and around the umbilicus. This symptom, in many cases, constitutes the principal source of suffering to the patient, during nearly the entire progress of the fever.

Sec. VI. — *Tympanites.* Flatulent distension of the abdominal parietes is a very common, and to a considerable extent, characteristic symptom of this disease. Its degree and frequency, like the diarrhœa

and abdominal pains, with which it is often associated, are, for the most part, proportionate to the gravity of the disease. It is commonly later in its appearance than the other gastro-intestinal symptoms, showing itself, often, during the second and third weeks of the fever. Dr. Hale, in his very excellent paper, remarks, that this symptom is found most frequently near the beginning of the disease. This is directly opposed to the result of my own observation, and I think to the best authorities. It varies in degree from a slight rigidity of the muscles and straightness of the parietes, to the extremest distension; in these cases occasioning, as has already been remarked, by its mechanical action on the lungs, no inconsiderable degree of dyspnœa. It generally persists, after its first appearance, till the fatal termination, or the approach of convalescence; although it is not unusual for it to vary considerably in degree, at different periods of the fever. The flatus rarely passes off, *per anum*, and seems to be but little disturbed by the peristaltic motion of the intestines.

There is another symptom, connected with the abdomen, which may be mentioned here. It was first particularly noticed, so far as I know, by Chomel, though it can hardly have escaped the attention, I think, of all who have had much to do with the disease. I allude to the gurgling sound, which is produced by pressure on the abdomen, especially over the region of the cœcum. If the distension is not excessive, pretty firm pressure, made alternately

with each hand, in the manner of seeking for deeply-seated fluid, will rarely fail, I think, to elicit this sensation and sound. It is chiefly interesting as one of the elements of our diagnosis.

ARTICLE VI.

MISCELLANEOUS SYMPTOMS.

Under this head I have still to enumerate and describe a certain number of morbid phenomena, more or less important, and more or less characteristic of typhoid fever, which could not well be grouped in any other manner.

SEC. I. — *Emaciation.* In most cases of the fever, there is a well-marked, and gradually progressive emaciation, although it is not often very obvious before the end of the second week. Where the disease is severe and prolonged, this emaciation is often extreme. In cases of great severity, terminating fatally at an early period, this symptom is hardly noticed.

SEC. II. *State of the Urine.* Modifications in the urinary secretion are generally present. Nathan Smith says, "In the commencement of the fever, the urine is not high colored, and is considerably copious, being often above the natural quantity, and deposits no sediment. In voiding it into a vessel, it often foams like new beer. As the disease advances, the urine becomes more highly colored, and

as it begins to decline, lets fall an abundant sediment. In very severe cases, the patient evacuates his bladder but seldom, allowing the urine to accumulate there in very large quantities."[1] Drs. Dobler and Skoda, in a description of the typhoid fever of Vienna, inform us that whenever the disease is at all severe the urine deposits no sediment, unless it be a slight cloud of mucus. On the subsidence of the fever there is often a grayish, dirty deposition.

Sec. III. — *Epistaxis.* Hemorrhage from the mucous membrane of the nostrils is quite common in the course of typhoid fever. Louis ascertained its occurrence in twenty-seven of thirty-four patients, who had the fever in a grave form, but recovered. It was present in somewhat less than half of his mild cases. It may occur at different stages of the disease, but it is most common during the early period, or in the first half of its duration. It sometimes occurs but once, but is, in many instances, several times repeated. It is generally small in quantity, sometimes amounting to only a few drops. At other times it is profuse, requiring the use of the tampon to arrest it. It is rarely, if ever, attended with or followed by any relief. It seems to be much less common amongst children than amongst adults.[2]

Sec IV. — *Cutaneous Eruptions.* The most

[1] Smith's Medical and Surgical Memoirs, p. 64.
[2] Louis's Researches, vol. ii. p. 34, 2d ed.

frequent and characteristic eruption upon the skin consists in what has been called the lenticular, rose-colored spot. This, indeed, is so common in typhoid fever, and so rarely seen in any other disease, that it has received the name of *typhoid eruption.* It consists of a small spot, not a pimple, slightly elevated above the surrounding skin, not always sensible to the touch, about as large, in circumference, on an average, as the head of a pin, and of a bright red, or rose color. When the skin is made tense or pressed by the finger the spot readily disappears, returning, immediately, on the removal of the pressure.

There is good reason to think, that this eruption is almost an invariable accompaniment of typhoid fever. It is true, that amongst thirty-six fatal cases, where the eruption was sought for, Louis found it in only twenty-six. So, in the Massachusetts General Hospital, Dr. Jackson found, during the years 1833, 1834 and 1835, the rose spots in only two-thirds of the patients. But it is very probable, that in many of these cases, the eruption was either overlooked, or that it had disappeared before the patients came under the care of their respective physicians. All the grave cases, which recovered, cited by Louis, excepting three ; and all his mild cases, without any exception, exhibited this eruption.

Louis says, in his second edition, that of fifty-four cases, carefully and daily observed, at La Pitie and the Hotel Dieu, subsequent to the publication

of his Researches, the rose eruption was present in all but five. In these it was wholly wanting.

It appears from the observations of Rilliet and Taupin, that this sign is as common in early as it is in adult life. It frequently appears a day or two sooner in cases of children. Taupin says, that he has never seen this eruption, in the course of any other disease amongst children, and he mentions, particularly meningitis; of which he has witnessed more than two hundred cases.[1]

It is found on various parts of the body, but much more frequently than elsewhere upon the abdomen and the chest. Now and then, it is seen upon the skin of the extremities and of the face. It is also found upon the back.

The spots vary in number. Sometimes they are but few, — six, eight, or ten. In other cases they are much more numerous, being sprinkled pretty abundantly over the chest and abdomen.

Dr. Jackson, of Boston, informs me, that he has seen them quite thickly scattered over the entire surface, even that of the limbs. I have this day, August 6th, 1842, visited a patient, sick about a fortnight with typhoid fever, who exhibits the spots upon every part of the skin, excepting that of the hands, ankles and feet. There are not less than twenty upon the face, and as many as forty may be counted on the left arm between the elbow and wrist. Their size varies from that of a small

[1] Louis's Researches, vol. i. p. 106, 2d ed.

point to a diameter of two lines. Most of them are pretty regular in their oval or circular outline, although a few of the larger ones are less so. They are, many of them at least, slightly but very distinctly elevated above the surrounding skin, and can be readily detected by the finger.

The most usual period of their appearance is during the second week of the fever. They generally come out successively, one after another, and after remaining, commonly, for a little more than a week, they successively and gradually fade away and disappear.

Another pretty common eruption consists in transparent vesicles, to which the name *sudamina* has been given. These vesicles are circular or oval in their shape, varying in size, from that of a small pin's head to that of a split pea. They are formed by the presence of a limpid fluid elevating the cuticle. Their most frequent seat is upon the sides of the neck and about the shoulders and axillæ, though they are sometimes scattered more extensively over the body. Chomel says, that he has never seen them on the face. They appear late in the disease, being rarely seen before the twelfth day. They usually remain for several days, and gradually disappear. They were present in two-thirds of Louis's cases, where they were carefully sought for, and in the same proportion, whatever was the severity of the fever. Dr. Hale attaches much less importance to sudamina as a diagnostic sign of typhoid fever than Louis

and Chomel. He says, "wherever the skin is for a length of time kept in a state of perspiration, from whatever cause, there sudamina will generally be found." This is far from being in accordance with the observations of Louis and Chomel. Louis says, that of forty patients with other diseases, in all of whom there were copious sweats, only three exhibited sudamina.

Sec. V. — *Eschars.* In this place may be properly noticed the tendency which exists, particularly in grave and protracted cases of typhoid fever, to ulceration of the skin. This is occasionally shown in the formation of ulcers upon the sacrum. In similar cases, it not unfrequently happens, that blistered surfaces are attacked with ulceration. They become, especially about the edges, covered with a white or grayish exudation, like that which is frequently seen on blistered surfaces in cases of protracted scarlatina, and which is commonly called *canker.* The ulceration, underneath this matter, sometimes becomes deep and extensive, adding, in no small degree, to the irritation of the disease. In some cases true gangrene occurs, followed by eschars and sloughing.

In a moderate proportion of grave cases typhoid fever is complicated with erysipelatous inflammation of the skin. Biles appear, occasionally, upon different parts of the body, on the approach or after the commencement of convalescence.

SEC. VI. — *Sequelæ.* The most serious sequel of typhoid fever is tubercular consumption. This has been particularly noticed by Dr. Gerhard, of Philadelphia. In patients of a strumous or cachectic habit, it not unfrequently follows immediately, or very soon, upon the fever, and usually runs on with great rapidity to a fatal termination.

Dr. Jackson notices a painful state of one or both legs, coming on after convalescence, attended with more or less lameness in motion, causing much anxiety, and continuing from a few days to several weeks. There were eight cases of this kind in the hospital. Entire recovery took place in all. Dr. Jackson also mentions five cases, in which, at a late period of the disease, there was swelling of one leg from well marked phlebitis.[1] Nathan Smith alludes to the same occurrence.[2]

I have now completed the enumeration and description of the symptoms of typhoid fever. Some of these symptoms are more important, more frequently present, and more characteristic of the disease than others. Some, again, are chiefly interesting and valuable as diagnostic, and others as prognostic, indications. It very rarely happens, that in any single case, they are all united. Under different circumstances, and in different cases, they are very variously combined, constituting different grades and varieties of the disease. These varie-

[1] Dr. Jackson's Report on Typhoid Fever, p. 133.

[2] Smith's Med. and Surg. Memoirs, p. 67.

ties might, properly enough, be described in this place; but I think it better to defer this description until after the anatomical lesions of the disease, and the relations, so far as these have been ascertained, between the symptoms and the lesions, have been given. I shall thus be enabled to present to the reader a more distinct, individualized and integral picture of the disease, with its ordinary and average features, than can otherwise be done. The varieties in its march, in its severity, in the grouping and combination of its numerous symptoms, will then be considered, in their place, amongst the other complex elements in the natural history of the disease.

CHAPTER III.

ANATOMICAL LESIONS.

Chomel, in his very excellent and full description of the pathological alterations in typhoid fever, divides them into two classes, consisting, respectively, of those which are constant and characteristic, and of those which are occasional. Louis does not attempt to follow any natural or systematic arrangement. In the present history, as a matter of convenience, I shall pursue, as far as this can well be

done, the same general order in the succession of subjects, that I adopted in the detail of symptoms; pointing out, under each head, the connexions between the symptoms of the disease and the lesions of the organs.

ARTICLE I.

LESIONS OF THE CIRCULATORY APPARATUS.

Sec. I. — *Heart and Aorta.* The most striking and common alteration of the heart consists in a diminution of its consistence. Louis found this organ natural, in volume, color and consistence, in one-half of his cases. In seventeen of forty-six cases, the softening was very well marked. Its tissue could be very readily torn and broken down. At the same time the heart is exceedingly flaccid, assuming, when removed from the body, a collapsed and flattened shape. The softening of the texture, and the general flaccidity, are most commonly found together, though they may exist separately. Under these circumstances the cut surfaces of the heart have a dull, dry appearance, and the walls of the ventricles are, in most cases, diminished in thickness.[1] These changes in the condition of the heart are usually accompanied with alterations in its color. The muscular tissue and the external surface are pale, in many cases, with a violet or livid tinge. The in-

[1] Louis's Researches on Typhoid Fever, vol. i, p. 331.

ternal surface is sometimes pale, and sometimes of a more or less deep, violet red. These alterations are found more frequently and more strongly marked, in cases which have terminated early, than in those which have been prolonged. It would seem, that at the Massachusetts General Hospital, lesions of the heart are of less frequent occurrence. Of twenty-eight cases noticed in Dr. Hale's Remarks, only two or three are said to have been "rather flaccid." It ought, however, to be remembered, that this term might be applied to the same condition of the heart by one observer and withheld by another. There have been differences of opinion, amongst pathologists, in regard to the nature of these lesions. I do not think there is any satisfactory evidence, that they are inflammatory.

The aorta is frequently more or less changed in color, on its internal surface. This change existed in somewhat more than one-half of Louis's cases. It consists of a morbid redness, more or less intense, sometimes in the form of bands or patches, sometimes generally diffused over the whole surface, and extending to the bifurcation of the aorta, or even considerably beyond it. This redness reaches through the inner, and affects, though in a less degree, the middle membrane of the cardiac cavities. The intensity of the morbid color is generally in proportion to the softening and flaccidity of the tissue of the heart. It is always found in connexion with the presence of blood in the aorta; and it is important to remark, further, that the most extreme cases

of softening of the heart commonly coexist with the presence of a dark, soft, non-fibrinous clot of blood in its cavities, or with blood not coagulated, but containing bubbles of air.[1]

The cause and nature of this reddening of the inner coats of the aorta have been the subjects of much investigation and much controversy. There is no place for any account of them here. I will merely say, that the opinion of Louis seems to me most in accordance with all the phenomena which enter into the solution of the question; and that opinion is, that this redness is the result of imbibition, by the tissues, of the coloring matter of the blood — the imbibition depending upon a special condition of the blood, or of the tissues, or, perhaps, of both. There is no conclusive evidence, at any rate, that the redness is the result of inflammation.

Sec. II. — *State of the Blood.* The most frequent alteration in the character of the blood consists in the diminution of the natural proportion of its fibrine. In some cases the cavities of the heart, especially the right, contain fibrinous concretions of a whitish or yellowish color; but more commonly, the blood is in the form of dark coagula, or entirely fluid. Of thirty cases, wherein the blood, contained in the heart and aorta, was carefully examined by Chomel, he found small and scanty fibrinous concretions in six, dark coagula in nine, and dark, fluid

[1] Louis's Researches on Typhoid Fever, vol. i. p. 333.

blood in fifteen. The occasional presence of air in this uncoagulated blood has already been noticed. According to the observations of Louis, the appearance of the blood, contained in the cavities of the heart, as has just been intimated, varies with the condition of this organ. When its consistence was natural, he found, especially in the right cavities, yellowish or whitish fibrinous coagula, more or less firm; when it was considerably softened, he found non-fibrinous coagula; and when the softening was very great, instead of coagula, he found only a small quantity of fluid blood containing air.

Blood drawn from the veins, during life, rarely exhibits the buffy coat; and when this is present it is generally soft, gelatinous, or infiltrated, and of a grayish or greenish color. This character of the blood has been particularly noticed by Louis, Chomel, and Bouillaud; and the results of their observations have been abundantly verified by the subsequent and more accurate researches of Andral and Gavaret. They found, that in typhoid fever, the proportion of fibrine in the blood was never increased above its natural standard; but, on the contrary, that in many cases this proportion was very much diminished; and, furthermore, that the degree of this diminution was very uniformly proportionate to the severity of the disease. These observers found a similar alteration of the blood in the eruptive fevers, while in all cases of simple acute inflammation, the quantity of fibrine was above its natural standard.

ARTICLE II.

LESIONS OF THE RESPIRATORY APPARATUS.

SEC. I. — *Lungs.* Neither the symptoms nor the lesions go to show, that the lungs play any very important part in the numerous and complicated phenomena of typhoid fever. Louis found them nearly natural in fifteen of forty-six cases; about the same proportion in which he found them so in other acute diseases, excluding, of course, those of the lungs themselves. Chomel found them healthy in ten of forty-two cases. The most characteristic alteration is described particularly by Louis, and, so far as I am aware, has not been noticed by other writers. It is of frequent occurrence in the fever of our own country. It has been called *splenization*, and *carnification* of the lung. The latter term may be well enough, but the former is wholly inappropriate; the appearance of the lung being entirely unlike that of the spleen. The portion of lung thus *carnified*, is of a deep, bluish red color; it has a tough, leathery feel; the finger penetrates and breaks it down with difficulty; it is wholly destitute of air, and sinks readily in water. When it is cut, the smooth surface is directly covered with a thick, red fluid. This peculiar lesion almost always occupies a circumscribed portion of the lower and posterior lobe of one or both lungs. It is quite unlike, in almost every respect, the second stage of inflammation, although the term *hepatization* has some-

times been applied to it. It is not indicated by any peculiar symptom during life.

Other changes, such as inflammation, usually not extensive; simple mechanical engorgement, taking place during the last hours of life; violet red spots or patches in the infero-posterior portions of the lung; circumscribed abscesses and tubercles, are present in a certain proportion of cases. The inflammation is often not discoverable during life, except by its physical signs.

Sec. II. — *Bronchia, Epiglottis, &c.* The mucous membrane of the bronchial tubes is frequently of a more or less vivid red color, sometimes with a violet tinge. That of the trachea is occasionally colored in the same manner, but is very rarely the seat of any unequivocal lesion. The same thing is true of the larynx. The epiglottis is more frequently and seriously diseased. In a moderate proportion of cases it is the seat of ulcerations, extending not only through its investing membrane, but into the fibro-cartilage itself; occasioning, sometimes, extensive destruction of the organ. In other cases it is simply denuded. These ulcerations are not found where the disease is rapidly fatal. They are frequently productive of some difficulty of swallowing.

Recent lesions of the pleura are very rare. In many cases there is an effusion of bloody serum, varying in quantity, from a few ounces to a pint or more, occupying both sides of the chest. This exudation probably takes place near the close of life.

ARTICLE III.

LESIONS OF THE BRAIN AND ITS MEMBRANES.

From the frequency and severity of the symptoms, consisting in deranged action of the brain, it would have been supposed, as a mere matter of *à priori* reasoning, that this organ would have exhibited corresponding alterations in its appearance. Such, however, is far from being the fact. As will be seen by the details which I am about to give, lesions of the brain are far from being universally present, and, when present, far from being found in any constant relation to the disturbed functions of the organ during life. Of thirty-eight cases, reported by Chomel, in which the brain and its membranes were carefully examined, fifteen presented no appreciable alterations in these organs.[1] The most common changes, in a certain proportion of cases, consist of moderate serous effusion between the arachnoid and pia mater; more or less vascularity of the pia mater itself; a rosy tinge of the cortical substance, and injection of the medullary portion of the brain. Of forty-six cases, Louis found the sub-arachnoid effusion, various in degree, in twenty-eight; vascularity of the pia mater in somewhat less than one-half; the rosy tinge of the cortical substance, uniformly diffused through its entire extent, in seventeen, and more or less injec-

[1] Chomel's Leçons de Clinique Médicale, p. 294.

tion of the medullary substance in all but eight. This injection is generally proportionate to the red color of the gray substance, and both phenomena are most common and strongly marked in cases which terminate early. The serous effusions, on the other hand, are more frequently found in cases that have been protracted. In rare instances there is a slight increase or diminution in the consistence of the brain, besides some other unimportant and accidental alterations.

In regard to the nature of these several lesions, there is, amongst pathologists, a difference of opinion. Those who still cling to the doctrines of the old, and exclusive physiological school, and who are haunted by the perpetual presence of *irritation*, regard the foregoing changes as the evidence and result of inflammatory action. Others think, that not only is there no satisfactory proof of the action of this morbid element, but that there are many and insuperable objections to such an opinion.

There is no ascertained relation between the cerebral symptoms, during life, and the pathological conditions of the brain and its membranes, appreciable after death. Delirium and somnolence are found to have occurred as frequently, and to have been as strongly marked, in patients whose brains presented no changes, or exceedingly slight ones, after death, as in those of an opposite character. Again, it is obvious, that these lesions are in no way peculiar to typhoid fever, since they are found almost as frequently in patients dead from other

acute diseases, excluding those of the brain itself and its envelopes, as in those dead from the fever.

ARTICLE IV.

LESIONS OF THE DIGESTIVE AND ABDOMINAL ORGANS.

SEC. I. — *Pharynx and Esophagus.* In a large proportion of cases of typhoid fever, these organs are found in their natural state. The only lesion of any considerable frequency, which they exhibit, consists in ulcerations of their mucous lining. These were noticed by Louis, in the pharynx, in eight of forty-six cases; and in the esophagus, in nearly the same proportion. They vary, in size, from one to six or eight lines in diameter, are circular, or oval, in shape, and generally quite superficial. In many of these cases there is difficult or painful deglutition. In others, especially where there is delirium, this symptom is wholly wanting, as it sometimes is, under the same circumstances, in cases of ulceration and partial destruction of the epiglottis.

SEC. II. — *Stomach.* The mucous membrane of the stomach, unlike that of the pharynx and esophagus, is generally more or less removed from a healthy condition. Louis found it free from any obvious lesion, excepting an occasional slight change of color, in about one third only of his cases. The alterations of which it is the seat are various. The

most common consist of changes in its color, its consistence, its thickness, in mamelonation, and ulceration. These alterations may exist separately, or, as happens more frequently, two or more of them are found together. The most common change of color consists of increased degrees of redness. This redness is of various shades, occupies different portions of the stomach, most commonly the great tuberosity, and seems to be dependent on different causes. Sometimes, even when not connected with any other change in the membrane, it is, probably, the result of inflammatory action; but in many instances there is sufficient evidence, that such is not the case.

Softening of the mucous membrane, sometimes existing as a simple lesion, is frequently associated with a diminution of its natural thickness. This alteration, either simple or complicated, is found in all parts of the membrane, but it is oftenest confined to that of the cardiac extremity. Of fourteen cases mentioned by Chomel, the softening was limited to this region in ten. In some cases it exists in separate bands; in others it spreads over a continuous portion of the stomach. The thinning occasionally extends through the membrane, resulting, of course, in its entire destruction. The softening with thinning is found, nearly always, in those cases, which terminate before the twenty-fifth day of the fever.[1]

Ulcerations of the mucous membrane are pre-

[1] Louis's Researches on Typhoid Fever, vol i. p. 173, 1st ed.

sent in a few instances. Louis found them in four of forty-six cases. Of forty-two cases, quoted by Chomel, they were not found in any. These ulcerations are small in size, superficial, and not very numerous. There is another pathological state of the gastric mucous surface, to which the name mamelonation has been applied. This lesion consists of small elevations of the membrane, pretty regularly circular or oval in their form, and scattered thickly and in considerable numbers over different portions of the stomach. This peculiar condition generally exists in connection with other alterations, especially with softening and increased redness. Like most of the gastric lesions it is oftener present in cases which terminate early, than in those which are prolonged.

Louis has taken great pains to ascertain the relationship, if any such exists, between these various pathological states of the gastric mucous membrane and the gastric symptoms. The result of his inquiries is this; that in a considerable number of cases, the several lesions, separately or combined, are found after death, when there had been no gastric indications of their presence during life; and that epigastric distress either alone, or with nausea, not unfrequently has occurred in cases where the mucous membrane of the stomach was found in a healthy condition. All the cases, however, in which there was epigastric distress, accompanied by repeated vomiting of bile, exhibited more or less

extensive disease of the membrane.[1] So far as the absence of any constant relationship between the lesions of the stomach and the gastric symptoms is concerned, the conclusions of Louis are abundantly sustained by the researches of Chomel.[2]

SEC. III. — *Small Intestines.* In all cases of typhoid fever there is lesion of the small intestines. This lesion is peculiar. It is found in no other disease. It is generally extensive. Constituting, as this lesion does, the characteristic, and, of course, the most interesting and important pathological element of typhoid fever, I shall describe it with all possible accuracy and completeness. Before proceeding, however, to do this, I will more briefly enumerate certain other occasional changes that are found in the small intestines.

The duodenum is not often the seat of any very considerable disease. Not unfrequently it is entirely natural, at other times the mucous membrane is morbidly red, softened, and, very rarely, the seat of a small number of minute, superficial ulcerations.

The small intestines are moderately distended with flatus in a few cases. Their contents consist, commonly, of a considerable quantity of mucus, especially in the upper portion, and of liquid bilious matter, of a light yellow or orange color, sometimes tinged with red. In cases where there has been hemorrhage from the bowels, blood, either

[1] Louis's Researches on Typhoid Fever, vol. i. p. 457, *et seq.* 2d ed.

[2] Leçons de Clinique Médicale. Par A. F. Chomel, p. 247, *et seq.*

coagulated or dark colored and grumous, is found in the intestines.

In many of these same cases, and in some others where there has been no hemorrhage, and where no blood is found in the intestines, the mucous membrane is the seat of sanguineous infiltration. This condition has been particularly described by Chomel. I have seen it more extensive, and more strongly marked in two cases of death from acute jaundice, in both of which there were hemorrhagic discharges from the bowels, than in typhoid fever. It may exist to the extent of only a few inches or of several feet. It is generally continuous, not in patches or zones. The color of the membrane ranges from a rose to a very dark red, and it has a peculiarly brilliant and trembling or quivering appearance, like jelly. Chomel found this lesion in seven of forty-two cases. He is very confident, that it is intimately connected with hemorrhage from that portion of the membrane, which it occupies.[1]

The mucous membrane, exclusive of the elliptical plates and the isolated follicles, is, in a majority of cases, more or less changed in color. In many it is preternaturally red. This redness is sometimes continuous, and extends through a large portion of the intestinal tract; at other times, and more frequently, it exists in patches or zones. Occasionally the color is grayish; this is particularly the case

[1] Leçons de Clinique Medicale. Par A. F. Chomel, p. 252, *et seq.*

when the disease has been protracted to a late period.

The consistence of the membrane, like its color, is found, in a moderate proportion of cases, quite natural. Oftener, however, it is more or less diminished, sometimes so much so as to resemble an unorganized pulp, spread, like a layer of paste, over the subjacent tissue. This softening is in some cases, quite simple; that is, it is not connected with any other appreciable alteration. In others, the membrane is, at the same time, reddened or thickened, or both. It is the opinion of Louis, that these two forms of softening are unlike in their character and causes. The latter he considers to be inflammatory; the former he thinks may depend on different causes, but that it is not the result of inflammation. In a part, at least, of the cases, he is inclined to regard it as the result of a post-mortem or cadaveric change.

The invariable and characteristic lesion found in the small intestines, to which allusion has been made, consists in alterations, differing somewhat in different cases, of the elliptical plates, or Peyer's glands. The condition in which these bodies are found varies with the duration of the disease, with the distance of the plates themselves from the ileo-cecal valve, and with other circumstances, the nature of which is unknown. Without entering into so minute and elaborate a description of the several forms of this lesion as has been, very properly, given in the original researches of Louis and Cho-

mel, I shall enumerate the principal and more striking varieties.

In a small proportion of cases, consisting of those which terminate early, the elliptical plates, together with the subjacent cellular tissue, are merely increased in thickness, with redness and softening. This increase of thickness is such, that the edges of the plates project to a distance of from one to two or three lines above the surrounding mucous membrane. Sometimes the hypertrophy of the plates and of the subjacent tissue is quite simple, the color and consistence of the membrane remaining unaltered. This simplest form of the lesion, that I am now describing, like all the others, which are more complex, is invariably found most advanced, and most strongly marked at the lower extremity of the ileum. Each successive plate, as we go upward along the intestinal tract, from the ileo-cecal valve, is less and less profoundly altered, till we arrive at those which are in a natural condition. The number of plates, thus changed, is very various; sometimes extending to fifteen or twenty, and at others, limited to one or two, and these always in the immediate neighborhood of the ileo-cecal valve. Louis says, that in two-thirds of the cases, the number of plates, more or less altered, is from twelve to forty.

The surfaces of the thickened plates frequently present a granular or finely mamelonated appearance, occasioned by an enlargement of the gray orifices of the cryptæ which go to make up the

plates. This condition becomes very manifest when the gland is detached from its subjacent tissue and held between the eye and the light. At other times, the surface of the thickened membrane corresponding to the plates is quite smooth and level.

In a great majority of cases the plates, instead of being merely thickened, with or without redness and softening, are more or less extensively the seat of ulcerations. These ulcerations vary very much in size and in number. It frequently happens, for instance, that in proceeding from above downwards, in our examination, after having passed over several plates simply thickened, we come to one of them in which there is a single, circumscribed ulceration with perpendicular edges, extending more or less deeply into the thickened tissues. As we go on towards the termination of the intestine, the ulcerations become more and more numerous and extensive, till at last, for several inches next to the valve, the plates are entirely destroyed, and we find only ulcerations, corresponding to their sizes and shapes, occupying their places.

These intestinal ulcerations are commonly more or less regularly rounded or oval in their shape. Sometimes, however, their borders are irregularly jagged and angular. So their edges are in most cases pretty regularly perpendicular and smooth, but sometimes they are ragged and shreddy. The bottoms of the ulcerations vary, of course, with their depths. They consist, sometimes, of the cel-

lular tissue immediately under the mucous membrane; sometimes of the muscular coat, and, sometimes, of the peritoneal covering. Occasionally this covering itself gives way, perforation takes place, and the contents of the intestine are discharged into the cavity of the peritoneum. Louis found this lesion in eight of fifty-five cases. Chomel quotes two instances of its occurrence, in his clinique at the Hotel Dieu; in one of which, however, the perforation took place in the large intestine. The perforation is usually single, small in diameter, and near to the termination of the ileum. In one of three cases, mentioned by Dr. Hale, it was at the distance of forty-four inches from the ileo-cecal valve. It generally takes place at a late period of the disease. It is a very singular fact, that this fatal accident commonly occurs in the course of very mild, or almost entirely latent, forms of the fever. This was the case in ten of twelve instances cited by Chomel.

There is another peculiar appearance of the diseased plates, which is found in a certain proportion of cases; according to Louis, in somewhat less than one-third. This seems to consist in a morbid change or transformation of the sub-mucous cellular tissue. Instead of being simply hypertrophic, with or without redness and softening, as in the cases already described, it is converted into a substance of a yellowish color, destitute of any traces of organization, presenting a surface somewhat glossy when cut, and about as hard and friable as

crude tubercle. This peculiar condition was observed in several subjects, during the grave epidemic of 1833–4, in the city of Lowell; and in accordance with the fact, previously noticed by Louis, it was most frequent and striking in cases which terminated quite early. This would seem to indicate, that the alteration in question is connected with the more severe and rapid forms of the disease.

I have spoken of this lesion of the glands of Peyer, in some of the forms which have now been enumerated, as invariably present in typhoid fever. I have also spoken of it as characteristic of this disease. The question of the absoluteness of this pathological law, of the constancy of the relationship between the intestinal lesion and the group of symptoms by which we recognise the disease, during life, will be further considered when I come to treat of the diagnosis of typhoid fever.

The only remaining alterations found in the small intestine, of which it is necessary to speak, are those of the isolated follicles or Brunner's glands. Louis found them more or less diseased in twelve of forty-six cases. They are subject to the same changes, which have just been described, in connection with the elliptical plates, and like the latter, they are most numerously and most profoundly altered in proportion to their proximity to the ileo-cecal valve.

In this disease, as in most others, it sometimes happens, that death takes place, unexpectedly, from

unknown causes, or from indiscretions in diet and regimen, after the establishment of convalescence. These occurrences have enabled us to ascertain the appearances of the diseased glands, during their march towards their original, healthy condition. The deep red tint, characteristic of acute inflammation, is found, in these cases, to have given place to various shades of gray, ash color, brown and blue. The edges of the ulcerations, if such have existed, are smooth and flattened, passing off imperceptibly, each way, into the bottoms of the ulcers, and into the adjacent healthy membrane. These cicatrizing ulcers are always confined to the lower portion of the intestine. Of forty-two cases, Chomel found eleven, in which there was either partial or complete cicatrization of the ulcerated glands; and in all these the cicatrization was limited to the last six or eight inches of the ileum. It would seem to be very certain, that the process of restoration in the diseased glands follows the same march, from the ileo-cecal valve upwards, which is so evidently followed in the development of the lesions themselves.

It is the opinion of Chomel, that where the cicatrization of the ulcers is complete, all traces of the lesion finally disappear. He says, that in the numerous autopsies at the Hotel Dieu, in many of which there was good reason to think, that the subjects had formerly had typhoid fever, there were never found any obvious proofs of old ulcerations, in the form of remaining cicatrices.

Sec. IV. — *Large Intestine.* There are only two alterations of the large intestine, especially connected with typhoid fever. These are its distension by flatus, and ulcerations. The flatulent distension is present in a large proportion of cases. It is sometimes very great, pushing up the liver, the stomach and the diaphragm much beyond their usual positions, and accounting for the extreme tympanitic enlargement of the abdomen during life. Louis found this meteorism of the large intestine most frequently present and most strongly marked in cases which terminated between the twentieth and thirtieth day.

Ulcerations are found in about one-third of the cases. They were present in twenty-three of seventy-four examinations made by Louis and Barth. They are generally small in size, more or less regularly rounded, not very numerous, more superficial than those of the small intestines, and occupying most frequently the cecum, though not confined to this portion of the large intestine. This lesion is most common in cases terminating late in the disease. In a small number of instances, the sub-mucous cellular substance of the isolated follicles is found to have undergone the same yellowish transformation, that has already been spoken of as occurring in the elliptical plates.

The mucous membrane of the large intestines is sometimes healthy throughout. At others it is reddened, or thickened, or diminished in consistence. There is nothing, however, in these last men-

tioned alterations in any way peculiar to typhoid fever; since they are found as frequently in many other acute diseases as in this. The contents of this portion of the alimentary canal are usually thin, and of a yellow or greenish color.

As to the relation between the intestinal lesions on the one hand, and the various abdominal symptoms on the other, I have but little to say. It would be unreasonable to suppose that such a relation does not exist. There can be no doubt, that the diarrhœa and the abdominal pains are connected with the different lesions of the intestinal canal. It is, nevertheless, sufficiently evident, that this relation is far from being constant and invariable. In this, as in almost all other diseases, the violence of the symptoms, the perturbations and perversions in the functions of the disordered organs, are not to be measured exclusively by the appreciable pathological alterations, which may exist in the organs themselves. Other elements and other influences, many of them obscure and difficult to seize and to estimate, are concerned in the production of the symptoms. We thus find in typhoid fever, that although there may be a general relationship between the abdominal symptoms and the intestinal lesions, sometimes the lesions are almost entirely latent; they are not revealed by any characteristic symptom during life. Occasionally, extensive ulceration of the elliptical plates, with changes of the mucous membrane, may exist without giving rise to much diarrhœa or to any other prominent abdominal symptom.

Sec. V. — *Lymphatic Glands.* The glands of the mesentery are always found more or less changed; according to their position, and according to the period at which the disease has terminated. Where death takes place before the expiration of the third week, they are increased in volume, diminished in consistence, and of a rosy or red color. If life is prolonged beyond this period, the volume is found more nearly natural, the softening is less marked, and the red color is supplanted by various shades of gray and violet. In some of them there are found small yellow points of a purulent deposition. The diseased glands correspond, very nearly, to the altered elliptical plates; those nearest the ileo-cecal valve being most changed in their appearance. In a few instances the glands are moderately enlarged, softened and reddened, opposite the the upper plates of the intestine which continue healthy.

The glands of the mesocolon are also affected in a similar manner, but less extensively and less constantly. The same observation, with the same qualification, is true of the other lymphatic glands of the body. It is also true, that these glands are rarely changed from their healthy state in any other acute disease.

Sec. VI. — *Spleen.* The spleen is almost always more or less altered in its appearance. The most constant change consists in an augmentation of its volume. In many cases it is three or four times as

large as it is in its natural state. It is, also, very generally diminished in consistence. This softening is sometimes extreme, so that the parenchyma of the organ is reduced almost to an inorganic, pulpy mass. The increased size of the spleen and its softening frequently exist together, but not always. The cases in which this happens most commonly, and in which the two lesions are strongly marked, are those terminating most rapidly. The color of the spleen is very often changed from its healthy appearance, though not so uniformly as its volume and consistence. It is generally darker than natural, of a deep, bluish brown, and sometimes almost black. These changes of volume, consistence, and color generally extend uniformly throughout the whole substance of the spleen. Louis found this organ in its natural condition only four times in forty-six examinations. All the alterations, to which it is subject, are most strongly marked in those cases, which terminate before the thirtieth day.

I have avoided, for the most part, the discussion of questions relating to the nature and causes of the various lesions which are found in typhoid fever. It may be well, however, to observe here, that these alterations of the spleen can hardly be attributed to any inflammatory action. The reasons adduced by Louis for this opinion seem to me to be sufficiently satisfactory. Pus, the most unequivocal evidence of inflammation, is never found; the serous envelope of the spleen is unaltered, and the softening and enlargement affect uniformly the whole sub-

stance of the organ; which, so far as all analogies enable us to decide, would not be the case, if these lesions were the result of inflammatory action. In the present state of our knowledge, it is enough, perhaps, to say, that these alterations of the spleen, in typhoid, as well as in other fevers, hereafter to be described, depend upon some special and peculiar cause, connected with the diseases in which they occur, the nature and operation of which is unknown to us; and further, that the lesions seem to be associated with that pathological element, so obscure in its nature and causes, but so extensive and fatal in its results, to which the term *congestion* has been applied; and not with that other element to which the term *inflammation* has been applied.

Sec. VII. — *Liver.* The only alteration of any considerable frequency, in the liver, consists of softening. This existed in about one-half of Louis's cases; but inasmuch as it was found oftenest during the warm season, it may be, that to a considerable extent, at least, it is a cadaveric phenomenon, resulting from commencing decomposition. In a certain proportion of cases the color of the liver is paler than natural, and it is less filled with fluids; less frequently, it is darkened and reddish, and moderately engorged with blood. Andral found the liver almost constantly healthy.[1]

There is no constant or uniform alteration in the

[1] Andral's Clinique Médicale, vol. iii. p. 579.

qualities of the bile contained in the gall bladder. Oftentimes it is found reddish, greenish, and abundant; at others, it is darker, of various shades, less liquid, viscid, and less abundant. Occasionally, the mucous membrane, lining the gall bladder, is manifestly inflamed, and the bladder contains pus. There is nothing in the condition of the liver, or of its secretion, at all peculiar to typhoid fever.

Sec. VIII. — *Pancreas; Salivary Glands; Urinary Apparatus; and Sexual Organs.* These several parts are generally found in a healthy state, and the occasional lesions, which they exhibit, are such as occur in other acute diseases.

The accurate and extensive researches of Rilliet and Taupin have shown that the same anatomical lesions are found in patients under fifteen years of age as in adults. The differences, in this respect, between the two classes of cases, are too few and unimportant to make it worth while to notice them particularly.

Sec. IX. — *General remarks.* Such are the conditions of the several organs and tissues of the body in typhoid fever. It will be seen, from the detailed descriptions of these organs and tissues, which has just been given, that the lesions in this disease are numerous and profound. Its pathological anatomy corresponds, in complexity, variety, and extent, to its symptomatology. There are, indeed, few, if any, diseases, of an acute character, and of common

occurrence, in which this complexity, variety and extent, of symptoms and pathology, constitute so prominent and so striking a feature as in this.

Some of the lesions, as has already been said, are more or less accidental; that is, they do not necessarily constitute any part of the pathological anatomy of the disease. They are not constantly present. Many of these, however, such as the changes in the mucous membrane of the stomach, and the alterations of the spleen, are of very frequent occurrence; and we have good reason to believe, play generally an important part in the pathology of the disease. Other lesions are not accidental, but essential; necessary to the disease. They always enter into its composition. They make up one of its constituent elements. They are invariably present. This is the case with the alteration of the elliptical plates of the small intestine, and the lymphatic glands of the mesentery, corresponding to these altered plates.

The real and relative importance of the several lesions, accidental and essential, is a question, in the actual state of our knowledge, not susceptible of absolute and positive settlement. It is a very natural and philosophical conclusion, perhaps, that the essential and constant lesions are more important than those of an opposite character. This is true, of course, so far as diagnosis is concerned; so far as the fixing and identification of the specific disease is concerned, but it is very questionable, whether these lesions exert a more powerful influence upon the rapidity, and the danger of the disease, than

some of the others. It seems, indeed, very probable, that in many cases, life is destroyed or the disease is rendered dangerous and severe, by the successive development of these secondary alterations, rather than by the extent and gravity of the essential lesions alone.

The order of succession, in which the several lesions commence and are developed, is, also, a matter not susceptible of very rigorous demonstration. Death almost never takes place, in the disease, before the termination of the first week, and not often as early as this. Still, a careful study and comparison of the pathological appearances, which are presented in cases of differing durations, will enable us to arrive at a reasonably certain approximation to the truth. There can be but little doubt, I think, that one of the first, probably the first, pathological alteration, which takes place in the solids, consists in the tumefaction of the elliptical plate or plates nearest to the ileo-cecal valve. This tumefaction is accompanied or followed by other changes, an afflux of fluids, softening of the mucous coat, the hard, yellow transformation of the sub-mucous tissue, and, finally, by ulceration; and these several lesions, taking place, first in the plates nearest to the ileo-cecal valve, gradually and successively extend to those which are farther removed from it. Contemporaneous, probably, or nearly so, with these alterations, are the reddening, enlargement and softening of the mesenteric glands. The enlargement of the spleen and the diminution of its consistence occur,

also, there is good reason to think, in the early stages of the disease; and the same thing is probably true, though less constantly, perhaps, with the softening of other organs. The various pathological changes, which are found in the gastro-intestinal mucous membrane, begin and are developed, it would seem, at uncertain and indefinite periods, during the progress of the disease.

As to the relation which exists between these appreciable lesions, one or many of them, and the disease itself, if we may so speak, I have but little to say. This is a question, which is wholly theoretical in its character. Its settlement, by different individuals, will depend entirely upon the mode of interpreting the phenomena of typhoid fever, and the relations of these phenomena, which they may choose to adopt. One thing, however, we may say, and that with great confidence and without any qualification; to wit, that typhoid fever is not a gastro-enteritis. It may, correctly enough, be called a peculiar enteritis, or a dothinenteritis, but not a gastro-enteritis; and this for reasons sufficiently obvious. I do not think, however, that we are justified in referring typhoid fever, considered as a disease, as an integral, though complex, pathological condition and process or series of processes, to this single local lesion of the intestines. I do not think, that we are justified in considering the latter as the origin and cause of the former, as we consider acute inflammation of the mucous membrane of the large intestines the cause of that other

disease, that other integral pathological condition and process, or series of processes, which we call dysentery. The most striking analogies are all against this interpretation. It seems to me much more satisfactory and philosophical, much more in accordance with what is seen in many other diseases, to look upon the lesion of the elliptical plates, not as the local cause of all the other appreciable phenomena of typhoid fever, but as constituting one of the pathological elements in a very obscure and complex disease; all which elements, and this quite as much as the others, are themselves the result of some morbific agent, or influence, or process, the nature, sources and operation of which are wholly unknown to us. The lesion of the elliptical plates seems to me to bear the same relation to typhoid fever, considered as a disease, as that which their several characteristic eruptions bear to measles, scarlatina and small pox. In none of these have we any right to regard the cutaneous eruptions as the causes of the symptoms and of the other various phenomena, which go to make up the several diseases themselves. I shall have occasion to refer to this subject hereafter.

CHAPTER IV.

CAUSES.

The only causes of typhoid fever, the influence of which has been at all positively and accurately ascertained, are these three, to wit; age, recent residence in a given place, and contagion. I shall speak of these causes separately. In using the word cause here, I mean merely to express by it some of those circumstances or conditions amidst which the disease under consideration most frequently occurs. The actual, producing, efficient cause of typhoid fever, as of most other diseases, is entirely unknown to us.

ARTICLE I.

AGE.

The influence of age in the production, or perhaps in the permission, of typhoid fever is very striking, and very accurately ascertained. Setting aside, for the moment, the first fifteen years of life, this disease almost always occurs between the fifteenth and thirtieth years. It would seem probable, that a majority of cases occur during the seven years between eighteen and twenty-five. It is not often seen after the fortieth year, and but very few cases are recorded, in which it has occurred

after the fiftieth year. Of one hundred and thirty-eight cases, analyzed by Louis, fifty-nine were between the ages of twenty and twenty-five years. Of one hundred and seventeen cases, mentioned by Chomel, ninety-one were between the ages of eighteen and thirty years. The average age in two hundred and ninety-one cases, occurring in the Massachusetts General Hospital, analyzed by Dr. Jackson, was twenty-two years and a third nearly. In these cases the average age of the females was somewhat more than a year greater than the average age of the males. I do not know whether this difference has been noticed elsewhere by other observers. It may also be stated here, although I shall have occasion to speak of it more particularly when I come to treat of the prognosis in this disease, that the average age of the fatal cases is somewhat greater than of those which recover.

I am inclined to think, that this disease occurs more frequently after the fortieth year of life in the country, than seems to be the case in cities. Nathan Smith says nothing about its being particularly prevalent amongst the young; and in Gendron's memoir upon the disease, as it occurred in one of the French provinces, seven cases are mentioned in which the patients were between forty and fifty, three where they were between fifty and sixty, and four where they were between sixty and seventy-five years of age.

ARTICLE II.

RECENCY OF RESIDENCE.

The researches of Louis and Chomel show, conclusively, that, in the city of Paris, typhoid fever occurs more frequently amongst new than amongst old residents. This difference is very great. Of Louis's one hundred and twenty-nine patients, all but twenty-seven had resided in Paris only twenty months, or less; forty-four only five months, or less; and only four had resided there from infancy. Of Chomel's ninety-two patients, at the Hotel Dieu, forty-five, almost one-half, had resided in Paris only one year, or less; and only two had lived there from infancy. I do not know whether this influence has been noticed in our own cities. In the city of Lowell, the disease has generally attacked those who have not been long residents there; but it would not be safe to rely upon this fact alone, since a large part of the young population of that place have been residents, at most, for only a few years. It is very certain, I think, that the influence, now under consideration, cannot be so obvious in the country as in large towns and cities. No notice is taken of it by that sagacious and careful observer, the late Nathan Smith. I have known the disease to prevail extensively, and in a very grave form, amongst the permanent residents of a country village. This, indeed, is a frequent occurrence in the agricultural regions of our

Eastern states, and of France, where the population is generally native and fixed.

ARTICLE III.

CONTAGION.

The general opinion has been, and probably still is, that typhoid fever is not propagated by contagion. Louis, in his first edition, published in 1829, says nothing upon this subject. Chomel, in his Leçons de Clinique Médicale, published in 1834, although he, himself, was inclined to the opposite opinion, says that not more than one physician of a hundred, in France, regarded the disease as contagious. Andral says he never saw any evidence of its contagiousness. In 1829, M. Bretonneau read to the Royal Academy of Medicine a paper, intended to show, that the disease, as it prevailed in the country, was often transmitted from one individual to another. Leuret, about the same time, adopted a similar opinion. The subsequent researches of Gendron, Ruef, Putegnat, and others, have confirmed this opinion, and Louis has adopted it in the second edition of his work, published in 1841. Many years, however, previous to these publications, Nathan Smith asserted, in the most positive and unqualified terms, the contagious character of this disease. His essay was published in 1824. "That the typhous fever is contagious," he says, "is a fact so evident to those who have seen much of the disease, and who have paid attention to the subject,

that I should have spared myself the trouble of saying anything with regard to it, did I not know, that there are some physicians in this country, who still dispute the point; one which, I think, can be as fully demonstrated, as that the measles, small-pox, and other diseases, universally allowed to be contagious, are so."[1] Dr. Smith then mentions several instances, which had fallen under his own observation, where the disease seemed to have been communicated through the medium of a contagious principle. From amongst these I select the following. "A young man, a pupil of mine, was attacked with the typhous fever, from which he recovered with some difficulty. Some of his family, who lived about forty miles distant, came and took care of him during his sickness. Upon his recovery, they returned home, in good health, but soon after sickened with the same disease, and communicated it to others, who had not been exposed in the first instance. From this it spread to numerous other families in the vicinity, who had been exposed to the contagion. In the whole town where this occurred, there had been no case of typhous fever for many years, till brought there by the circumstance above related."

"During the prevalence of the typhous fever in Thetford, Vermont, a woman went there from Chelsea, about ten miles distant, to visit and administer to a sister sick of this disease. Upon her

[1] Smith's Med. and Surg. Memoirs, p. 47.

return, she was herself attacked by it and soon after died. Others of her family contracted it of her; and in about four weeks, there were thirty persons taken down with typhus, all of whom had been exposed to the contagion.[1]

The memoir of M. Gendron, upon this subject, is very full and elaborate. He adduces a great number of instances, similar to those above quoted from Dr. Smith, many of them very striking and conclusive, to show the contagiousness of the disease. He believes that it is transmissible by direct and repeated contact; by the presence of the sick without contact; that it may be carried from a sick person and communicated to another by a third, who does not have the disease; and, also, that it may be contracted from exposure to infected clothing, beds and similar fomites. He regards the first mentioned mode of transmission as altogether the most common. The indirect transmission of the disease from one individual to another, through the intervention of a third, he thinks does not often happen, except when it is prevailing more or less extensively as an epidemic. The disease is most frequently communicated to those who are in the closest and most constant relation to the sick, their nurses and immediate attendants.

According to the observations of M. Gendron, typhoid fever propagates itself very slowly by contagion. The interval between the successive cases

[1] Smith's Med. and Surg. Memoirs, p. 47, 84.

varies from three weeks to a month; so that the fever is often several months in spreading through a village or neighborhood. The period of incubation he thinks rarely exceeds eight or ten days, though it sometimes extends to fifteen, and is occasionally as short as twenty-four hours. He is, also, led to the conclusion, that the power of transmission or communication does not exist in the early period of the disease; that it is rarely active before the sixteenth day; and, in general terms, that it continues from the third week to an indefinite period, including convalescence. He states some facts, which seem to show that the contagious matter of the disease may remain active in a bed for two or three years. He supposes it probable, that certain circumstances, connected with the disease in the country, such as small, close rooms, and the more constant presence of their attendants with the sick, may render its contagious character more obvious and certain than in cities. He acknowledges, that in many instances, he has been wholly unable to ascertain the source and origin of the first case, from which the others have been derived; and he admits, in their fullest extent, the great number of examples of immunity from the disease, after the most marked exposure; but he says, very truly, that all this is as frequently seen in scarlatina, a disease unquestionably contagious, as it is in typhoid fever.

It is easy to see, that this question is one of great practical importance. It can be fully settled only

by further and more various observations ; and these observations, for obvious reasons, can be best made amongst the scattered population and in the small villages of the country. The paper of M. Gendron is drawn up with great fairness, and it throws much new and valuable light upon the subject ; although he sometimes adopts conclusions, favorable to his opinions, which his facts are hardly sufficient to justify. He is somewhat too ready, in the present state of our knowledge, to consider all cases of the disease that are in any way susceptible of being accounted for by the action of a contagious principle, to be certainly and necessarily so accounted for.

There is one other circumstance, bearing upon this question, which it is important to notice. I mean the immunity from a second attack, which seems to be conferred by the occurrence of the disease. M. Gendron gives several remarkable instances of this exemption. The village of Petit-Gênes, containing only fifteen persons, was visited by typhoid fever in 1826. Twelve of these persons suffered from the fever, and of the three who escaped, two had had it previously. In March, 1829, the disease reappeared in the village, apparently introduced by contagion, and was confined to a single family, who had taken up their residence here subsequent to the year 1826. Five members of this family had the fever, and although they were constantly visited, and nursed during the nights, by their neighbors, the subjects of the disease in 1826,

the fever did not extend beyond the family.[1] Chomel says, that of one hundred and thirty patients, at the Hotel Dieu, no one, so far as this point could be ascertained, had previously had the disease.

This same immunity was noticed by Nathan Smith. He says, "My own personal experience is strongly in favor of the opinion I have advanced of the non-liability of the same individual to a second attack of typhus; for during the twenty-five years since I first attended patients in this disease, and in that time I have visited many hundreds, and have witnessed its prevalence several times in the same village, I have never known nor heard of its recurrence in the same person.

I once attended a numerous family, every member of which was sick of typhus, except two, who escaped at that time; but two years afterwards, when the disease again appeared in that neighborhood, those two individuals of the family, and those alone, were attacked.

In another family, which I attended, consisting of eight persons; five of the eight had the disease during the autumn, and early part of the winter, and recovered. The next summer, the remaining three and another person, who had been added to the family after the former sickness, were attacked by it, while all those previously affected escaped."[2] It need hardly be said, that this character of typhoid

[1] Memoir sur les epidemies des petites localités. Par M. Gendron. Journal des Connaissances Médico-chirurgicales. Année, 1834.

[2] Smith's Med. and Surg. Memoirs, p. 52.

fever, if fully established, although not in itself positive evidence, does nevertheless constitute a strong ground of belief, resting on analogy, for the contagious nature of the disease.

ARTICLE IV.

MISCELLANEOUS SUPPOSED CAUSES.

Besides the influence of the causes, thus far spoken of, the operation of which may be considered pretty well settled, there are certain other circumstances, which have been supposed to have something to do in the production or the permission of the disease, of which it is necessary to say a few words. Amongst these are locality, season, sex, the action of putrid substances, insufficient or unhealthy food, occupation, and the occasional, exciting causes of disease, such as exposure to cold, errors of diet, and excesses.

Sec. I. — *Locality.* Typhoid fever is, evidently, a disease of very extensive geographical prevalence. We have not the means of ascertaining its limits, but there is good ground, I think, for believing, that these limits are wider than those which circumscribe the prevalence of any other strictly idiopathic, non-eruptive fever. It is the common fever of the Eastern States. It is questionable, indeed, whether this section of the country is the seat of any other fever, unless it be an occasional sporadic case, or epidemic, of an obscure and doubtful character. It prevails, also, more or less extensively, in the Mid-

dle and Western States. I have seen it in Kentucky, where it is sometimes called the *red tongue fever*. It is, probably, less common in those portions of the United States, which are visited by the various forms of intermittent and remittent fever than in those which are exempt from these diseases; although more extensive and accurate observations than have yet been made are necessary to settle this point. Now that the means for correct and positive diagnosis of the several distinct fevers of our country are becoming more and more generally diffused, there is reason to hope that this, as well as some other circumstances, in the natural history of typhoid fever, will soon be satisfactorily established.

It would seem that the typhoid is the most common and generally diffused fever of the temperate latitudes of the continent of Europe. Certainly it is so of France, where it has been most extensively and thoroughly studied. It seems to be also the common fever of Germany. Louis saw it at Gibraltar in 1828. It occurs with considerable frequency in the British Islands, although it is not their most common form of fever. The means, however, for ascertaining, with any degree of precision, the actual extent and frequency of its prevalence in the several portions of Great Britain do not exist, for the obvious reason, that no distinction has generally been made between this disease and the contagious typhus. It will probably be found to be of more common occurrence in certain por-

tions of the country than in others, and at certain seasons or periods of time. This subject will necessarily come before us again in the account which will be given of the investigations that have been made, within the last few years, in regard to the idenity or the non-identity of typhus and typhoid fever. It cannot, however, be fully understood without the aid of observations very much more extensive and discriminating than have yet been made. In the mean time, we can only approximate to the real truth in regard to the matter. Typhoid fever seems to have been of common occurrence at Dublin from 1826 to 1829. Dr. Kennedy states, that he found the elliptical patches more or less diseased in a large proportion of cases, during this period, presenting a striking contrast, in this respect, to the contagious typhus of 1837. Dr. Stokes also says, "In the epidemic of 1826 and 1827, we observed the follicular ulcerations in the greater number of cases. In many instances perforation took place, and the whole group of vital and cadaveric phenomena corresponded almost exactly to the dothinenteric affection of the French authors."[1] In Edinburgh, Dr. Christison says, "The intestinal affection has repeatedly presented itself in groups; the *constitutio dothinenterica*, to speak in nosographical language, has repeatedly appeared and disappeared as a subordinate or intercurrent epidemic, in the course of the more general epidemic, typhus."[2]

[1] Dunglison's Medical Library. [2] Ibid.

At Anstruther in Fifeshire, only thirty miles distant from Edinburgh, this would seem to constitute, as it does in France and in New England, the common form of fever. Mr. John Goodsir, Jr., informed his friend Dr. Reid of Edinburgh, that for five years he had attended about one hundred cases of fever, annually, in Anstruther and its neighborhood, amongst which there had been fifteen deaths. In ten of these he had succeeded in obtaining *post mortem* examinations; and, in all of them he had found the elliptical plates and the isolated follicles of the lower portion of the ileum elevated and ulcerated, and the mesenteric glands enlarged and softened. In four cases perforation of the intestine had taken place. From the slight sketch of the symptoms, given by Dr. Reid, as well as from the abdominal lesions, there can be little doubt, I think, as to the character of the fever.[1] It would seem, also, to be very common at Birmingham. Dr. Ward has published an account of a fever which prevailed in certain quarters of that city, in the summer of 1837, in all the fatal cases of which the lesion of Peyer's glands is said to have been present.[2]

Dr. Stewart remarks, that during the summer and autumn of 1836, the cases of typhoid fever received into the Glasgow Fever Hospital, were numerous; while from the month of November, in that year, at which time both the type and the amount of typhoid fever became more formidable,

[1] Edin. Med. and Surg. Journal, Oct. 1839.

[2] Dunglison's Medical Library.

till June, 1838, the period at which his connection with the hospital ceased, not more than a dozen cases, and these at long intervals, were admitted.[1]

As to the influence of circumscribed localities upon the prevalence of the disease, very little is known. It is sometimes absent from large sections of the country for a considerable period of time. Nathan Smith says, that for the first eight years of his practice, which was somewhat extensive in the latter part of the last century, near the Connecticut river, in New Hampshire, he neither saw nor heard of a single case of the disease. Subsequent to that time, for a period of twenty-five years, he "never so far lost sight of the disease, as to be unable to follow its changes from one place to another, and to tell where it was prevailing." "It seems to possess," he adds, "a migratory character, and travels from place to place; and after remaining in one village for a longer or shorter time, as, from one year to two or three, it ceases and appears in another."[2] It prevails often and extensively in the manufacturing villages of New England. This may, perhaps, be sufficiently accounted for by the circumstances favoring the occurrence of the disease, connected with the population of these villages. These are age, duration of residence, and exposure to contagion. In the city of Lowell, the largest manufacturing place in the Eastern States, containing now, 1842, a population of twenty-two

[1] Edin. Med. and Surg. Journal, Oct. 1840.

[2] Smith's Med. and Surg. Memoirs, p. 46.

thousand, an unusual proportion of whom are between the ages of fifteen and thirty, and very many of whom are new residents, the disease has been almost constantly present for the last fifteen years. In some years and seasons it has prevailed much more extensively than in others; and not unfrequently, for considerable periods of time, the cases have been occasional and few. It is a very common circumstance for it to exist more extensively in certain portions of the city than in others. But there is nothing fixed in these localities; they are sometimes in one part of the city, and sometimes in another. Instances have frequently been noticed, also, in various parts of the country, in which the disease is confined to a single family in a neighborhood. In these cases, several members of the family are sometimes taken with the disease nearly simultaneously; at others they are affected in succession, one after another, so that the fever may occupy some months in passing through the family. Dr. James Jackson, of Boston, noticed this circumstance, particularly, in a paper in the New England Journal of Medicine and Surgery, for July, 1822. He supposes the cause to be in some way connected with the soil of the immediate locality, although not at all depending upon any filth or decomposing substances, since no such substances could be discovered, and since the houses were often new, clean, in good situations, and occupied by families in easy circumstances. He expresses his disbelief in the agency of contagion,

although he says, that he has often known the disease to occur in friends and hired nurses, who had gone from other families to attend the sick, especially when such persons have remained in the house with the diseased subject, for two or three days at least, and generally for a longer time. A remarkable example of the obscurity in which some of the causes of typhoid fever are enveloped, and of its singular and inexplicable connexion, at certain times, with certain localities, was exhibited during the winter of 1834–5, in the city of Lowell. In the course of the winter there were occasional cases of the disease in almost every part of the city, but by far the greatest number occurred amongst the female operatives of a single cotton mill; and most of these, even, were confined to two rooms. This mill is situated on a line with five others, and in their immediate vicinity. It is about one hundred and fifty feet in length, and five stories high; the rooms occupying the whole length and breadth of the mill, with numerous windows on every side. The ground room was used for carding, and the average number of hands employed in it was thirty-five. *There was not a single case of the disease from this room.* The second story was used for spinning. Four females employed in it went out sick during December; one on the 8th, 9th, 10th, and 15th, respectively. The one who left on the 10th, died on the 27th, of the same month. The average number employed in this room was sixty. The third story was appropriated to weaving, and the

average number of operatives employed in it was sixty-five. Between December 5th, 1833, and January 22d, 1834, *twenty-six* girls left this room; all of whom, excepting some three or four, were ascertained to have had the fever. They left the mill in the following order; one, Dec. 5th, two on the 11th, one on the 13th, one on the 18th, two on the 20th, two on the 21st, three on the 22d, two on the 23d, one on the 24th, 27th, and 31st, respectively. One left Jan. 5th, two on the 8th, two on the 9th, and one on the 10th, 12th, 21st, and 22d, each. The fourth story was used for the same purpose, and had the same number of employed hands as the third. Between Dec. 13th, and Jan. 27th, eighteen girls left this room sick. One left Dec. 13th, one on the 17th, two on the 19th, one each on the 20th, 22d, and 23d, two on the 24th, and one on the 27th. Three left Jan. 1st, and one on the 7th, 9th, 10th, 16th, and 27th, successively. From the fifth story, occupied as a weaving room, and having from twenty-five to thirty girls employed in it, there were but two sick. One of these left the room Jan. 10th, and the other Jan. 17th.

Thus, of one hundred and thirty females employed in two rooms of the same building, nearly one-third were attacked with typhoid fever between the days of Dec. 5th, 1834, and Jan. 27th, 1835. Of this number nine died in Lowell. There were also two deaths ascertained to have taken place amongst those who left the city immediately on

leaving the mill. During this period there were a few cases of fever in various other parts of the city. Nothing could be discovered about the mill or the two weaving rooms in any way to account for the connexion of so many cases with this particular mill and these particular rooms. There was but a very small number sick from the neighboring mills. The overseer of the room in the third story, where the largest number was attacked, informed me, that for nearly five years, during which he had had the care of the room, there had been amongst those at work in it only three deaths. The weather at the time when the fever began to show itself was extremely cold. There did not seem to be any connexion between the disease and the situation of the boarding houses of those who suffered from it. These houses accommodated from twenty to thirty girls each; in a few of them there were two or three patients sick at the same time, but in many of them only one.

An instance of this connexion of the disease with circumscribed localities, somewhat similar to the foregoing, took place in 1835, at a woollen manufacturing establishment on the Neponset river, in Dedham; a short account of which was published by Dr. Jackson, in the Boston Med. and Surg. Journal. On the 11th, and 12th of April, eighteen girls, living in the same house, were attacked with typhoid fever; one of whom died. All these girls worked in one of two mills, near the house. From the other mill there were no cases; and neither

were there any cases, in the neighborhood, excepting those in this one boarding house. The entire number of its inmates was fifty-eight. The house had been built only eight years; it was clean and not crowded; and no death had ever taken place in it till about a week before the appearance of these eighteen cases of fever. On the 5th of April, a girl from the same mill with the others, died after an illness of nearly three weeks, with what was at first considered by her physician, Dr. Spear, as scarlatina; but which he regarded subsequently as typhoid fever. All the females who were attacked on the 11th, and 12th of April, had seen this first patient; some of them, however, only after death. In May another girl had the fever; not an operative in the mill, but a domestic in the boarding house.

Sec. II. — *Season.* It is not settled whether typhoid fever occurs, with any degree of uniformity, more frequently in one season of the year than in another. The common impression, I think, in New England, is, that it prevails oftenest in the autumn. Dr. James Jackson says, expressly, that such is the fact; although he admits that it may be seen in any month of the year. Nathan Smith does not speak of its occurrence more frequently at one season than at another, and he thinks that he has seen it, not only in every month, but in every day of the year. Amongst the epidemics mentioned by Gendron, one continued from May to October, one

from February to May, and one from March to January. The most extensive and fatal visitation of the disease, in the city of Lowell, took place during the winter and early spring. I am very sure, however, that, as a general rule, its annual prevalence is greatest in the autumn. In New England it is not unfrequently called the autumnal or fall fever.

Sec. III. — *Sex.* The influence of sex in the production of typhoid fever is not determined. Nathan Smith did not notice any difference in the liability of the two sexes. Dr. James Jackson expresses his belief, that the disease occurs amongst men much more frequently than amongst women. M. Tardieu observed, that at the village of Ventenges, in France, in 1835, women and children were most frequently attacked. M. Ruef says, that in the epidemic of Bischoffsheim, in 1832, females suffered more extensively than males. These facts may, perhaps, be accounted for by the more frequent and constant exposure to the sick, to which females are subject, in their capacity of nurses and attendants.

Sec. IV. — *Miscellaneous.* In regard to the action of putrid substances, and to the influence of scanty and unhealthy food, it is sufficient, perhaps, to say, that there is no satisfactory evidence of their operation in giving rise to the disease; and the same remark may be made in relation to different occupa-

tions and situations in life. The effect of what are usually regarded as the most common exciting causes of many forms of disease, such as exposure to cold, strong moral impressions, errors of diet, and excesses, is not very obvious in the production of typhoid fever. Of one hundred and fifteen patients, at the Hotel Dieu, who were examined by Chomel upon this point, seventy-nine were wholly unable to refer the access of the disease to any appreciable cause. It may be added, further, that persons suffering from the disease are, generally, immediately previous to the attack, in full health.

Piorry is of the opinion that a majority of the patients in the Paris hospitals, are received from small and poorly ventilated lodgings; but the influence of this cause in giving rise to typhoid fever is not generally admitted, and certainly does not seem to be very evident.[1]

[1] Clinique Médicale de l'Hopital Pitié. Par P. A. Piorry, p. 175, *et seq.*

CHAPTER V.

VARIETIES AND FORMS.

Typhoid fever,. like almost all diseases, exhibits many varieties in its character and appearances, some of which, before proceeding to speak of its diagnosis, it is important to notice. One of these varieties depends upon the degree of severity of the disease. Louis divides his cases into three classes; consisting, first, of those, which terminated fatally; second, of those, which were grave and severe, but which recovered; and, third, of those, which were mild. It is obvious enough, that this arrangement is somewhat arbitrary; that the several degrees of severity must run off, by imperceptible gradations, like the colors of the spectrum, into each other; and that, oftentimes, the line of demarcation between the classes must be shadowy and doubtful. Nevertheless, the distinction really exists; in a great majority of cases there is but little difficulty in recognising and appreciating it; and it is one, not only of convenience, but of great practical value and importance.

It is a very common occurrence for nearly all the more grave and alarming symptoms of the disease to be absent, from its commencement to its termination in health; and where its diagnosis is not well understood, these cases are often mistaken

for some other disease. Under these circumstances there is, frequently, but slight febrile excitement, little or no thirst, no affection of the mind, no diarrhœa, no pains in the abdomen. The patient sleeps well, the tongue may be nearly clear, slightly sticky, or covered only with a thin, brownish coat; there is little or no restlessness, or suffering of any sort, and the patient wonders why he is sick, and why he is obliged to lie in bed. But he *is* obliged to lie in bed. Place him in his chair, and he very soon wishes to get back to his bed. On assuming a sitting or upright position, he finds that he does not feel so well; his muscular strength is gone; his debility, though not extreme, is out of proportion to his other symptoms, and he is troubled, perhaps, with dizziness or ringing in the ears. It will be found on inquiry, that, either suddenly, in the midst of good health, or after a few days of vague and indefinite *not being well*, the patient was attacked with a chill, accompanied or immediately followed by pains, generally of moderate severity, in the head, back and limbs. None of these symptoms are accounted for by any local disease. In the progress of the fever, the headache goes off; there may be some degree of deafness; slight somnolence; occasional epistaxis, and, during the second week, the lenticular, rose-colored eruption will probably show itself upon the abdomen and the chest. In this class of cases, after the condition, thus described, has continued with but little change, during a period of from two to three weeks, the strength and

appetite begin to return, convalescence is rapid, and the patient is soon restored to sound health.

Between this, the mildest form of the disease, and those of the gravest and most dangerous character, there are, of course, all possible gradations. It is not necessary to describe them particularly. They are marked in different degrees, by greater prostration of strength; somnolence followed by or alternating with delirium; twitching of the tendons; picking at the bed clothes, or at imaginary objects; a dry, cracked, trembling tongue, red, brown or black; tympanitic distension of the abdomen, and diarrhœa.

There is another phasis, under which the mild form of typhoid fever sometimes presents itself, to which Louis applies the term *latent*. The disease, in this form, cannot be called absolutely latent, though it is nearly so. The local lesion of the intestine is present; in some cases it is positively ascertained to have been extensive and profound; but the disturbance and perturbation of many of the functions of the economy, usually accompanying this lesion, and constituting the rational symptoms of the disease, do not take place. The reason of all this is entirely unknown, and the most we can say about it is, that the same thing occasionally happens in other diseases. The latent form of typhoid fever, like the ordinary forms, is commonly marked at its commencement by chills, headache, and moderate febrile excitement. But the patient is often able to sit up, or even to keep about, and there are

no prominent symptoms of disturbance in the nervous system or the abdomen. It is very curious, as has already been observed, that the cases of perforation of the intestine have generally been found to occur in this variety of the disease.

All these different degrees in the severity of typhoid fever are frequently witnessed at the same time, during its prevalence in a given place. But it often happens with typhoid fever, as it does with many other diseases, with the bilious remittent, with true typhus, with scarlatina, with pneumonia, and so on, that during one season, and in one locality, its prevailing character will be mild and its mortality small, while in another season, its character will be grave, and its mortality large. I have, more than once, seen the disease pretty extensively prevalent, when nearly all the cases belonged to the mildest form. In the epidemic of the city of Lowell, during the winter and spring of 1833–4, the cases were generally grave, and the mortality consequently great. This difference in the severity of the disease during different years is very strikingly shown in the records of the Massachusetts General Hospital. During fourteen years, from 1822 to 1835, inclusive, there were three hundred and three cases of typhoid fever, and forty-two deaths; or one in a little more than seven. In the year 1830, the deaths were one in three and a half; in 1831, they were one in fourteen and a half, and in 1829, one in twenty-five. From 1832 to 1835, inclusive, the number of cases was one hundred and twenty-

nine, and the number of deaths twenty-two, making a mortality of one in a little less than six; while from 1836 to 1838, inclusive, the number of cases was one hundred and eight, and the number of deaths seven, making a mortality of one in fifteen. It is still more remarkable, that from November, 1836, to November, 1838, there were fifty-five successive cases, without a single death. It may be added here, that these wide differences in the mortality and severity of the disease, in different years, are not to be accounted for by any differences in the treatment.[1]

Chomel admits several forms or varieties of typhoid fever, not depending upon degrees of severity. These are the inflammatory, the bilious, the mucous, the ataxic and the adynamic. They depend upon the relative severity or predominance of certain symptoms, or groups of symptoms. In the inflammatory form, there is unusual strength and fullness of pulse, great heat and moisture of the skin, urgent thirst, and diminished secretion of urine. These symptoms are especially prominent only in the early period of the disease. According to Chomel, they occur oftenest in the robust, and during the winter months. The bilious variety is characterized by some yellowness about the lips and nose; a thick, yellowish or greenish coat on the tongue; a bitter taste, nausea and bilious vomiting. Chomel regards this form of typhoid

[1] Hale on the Typhoid Fever of New England. Communications of the Mass. Med. Soc. vol. vi. part iii. p. 254, 255.

fever, which occurs oftenest, he thinks, during the summer and autumn, and in particular localities, as identical with the bilious fever of authors. There is no doubt, whatever, that in the confusion worse confounded, which has always prevailed throughout the medical world, in relation to the diagnosis of fevers, and which is even now but very partially dissipated, typhoid fever has often been described under the name of bilious fever; but it is also quite certain, that if Chomel supposes typhoid fever and bilious remittent fever to be identical diseases, he is widely mistaken. The mucous variety of typhoid fever is not very distinctly characterized, even in Chomel's description of it. It can hardly be said to exist, as a distinct variety, any more than the bilious form. The term ataxic is applied to those cases in which there is great severity and predominance of the nervous symptoms, such as dullness, stupor, perversions of the senses, delirium, and spasms; or to those in which the disease is masked, and rendered irregular by a want of the usual correspondence in degree of severity between the more important symptoms. In these cases, there may be little or no delirium, or the pulse may be almost natural, when the disease is manifestly hurrying on to a fatal termination. The adynamic form is marked by extreme debility and prostration of strength, present at the commencement, or coming on in the course of the disease. The mind is lethargic; the pulse is feeble and soft; the urine

and the cutaneous transpiration are fetid, and the disease is often prolonged beyond the fourth week.[1]

CHAPTER VI.

DURATION, MARCH AND COMPLICATIONS.

ARTICLE I.

DURATION.

It is not often an easy matter to determine with accuracy the duration of a disease. Both extremities of the space to be measured are indistinctly defined. This is especially true of typhoid fever. The access of the disease is often gradual, and convalescence establishes itself by slow and almost imperceptible degrees. There is often, also, here, another source of difficulty, arising from the state of mind in which the patient is found. His impressions are cloudy; his recollections are indistinct, and he will often date the commencement of his illness several days later than it really occurred. Bearing these circumstances in mind, I proceed to state, as nearly as has been ascertained, the usual duration of the disease.

Dr. Jackson, following the example of Louis in

[1] Chomel's Leçons de Clinique Médicale, p. 340, *et seq.*

regard to pneumonia, fixes the commencement of convalescence at the time when the patient is able to take a moderate quantity of solid food, the febrile symptoms having subsided for at least two or three days previous to this period. In two hundred and fifty-five cases, at the Massachusetts General Hospital, between the years 1824 and 1835, inclusive, the average duration of the disease was twenty-two days. It was a little less than this in those under twenty-one years old, and a little more in those over. The duration varied in different years from eighteen to twenty-six days. Dr. Jackson thinks, that convalescence commences, in a few rare instances, as early as the seventh day.[1] Of one hundred and eighty-six cases, at the same hospital, between October 1st, 1833, and October 1st, 1839, the average duration was thirty-nine days.[2] Of sixty-eight cases, terminating favorably, cited by Chomel, he says that there was a decided change for the better, in fifty between the fifteenth and thirtieth days, and in more than one-half of these it took place between the twentieth and twenty-fifth.[3] Nathan Smith says that he has rarely seen the disease terminate under the fourteenth day from its commencement; and that it rarely extends beyond the sixtieth.[4] Of the forty-six fatal cases, analyzed in the great work of Louis, ten terminated

[1] Dr. Jackson's Report on Typhoid Fever, pp. 108, 109, 110, 111.
[2] Hale on the Typhoid Fever of New England, p. 241.
[3] Chomel's Leçons de Clinique Médicale, p. 41.
[4] Smith's Med. and Surg. Memoirs, p. 56.

between the eighth and fifteenth day; seven between the sixteenth and twentieth; twenty between the twentieth and thirtieth, and nine after this period.[1]

ARTICLE II.

MARCH AND COMPLICATIONS.

The march of the disease is, on the whole, pretty uniform and regular. In cases of average severity, the patients get gradually sicker from day to day, for two or three weeks; or, after the first week, their condition may continue with very little change until convalescence commences. The disease is not often marked by great and sudden alterations, either favorable or unfavorable, though these do sometimes occur. Neither is it marked by distinct stages, although Chomel divides it into three septenary periods, dating from the distinct and formal onset of the disease. This is arbitrary, but very well as a matter of convenience.

Typhoid fever is occasionally, but not often, complicated with other diseases. Nathan Smith says, that he has often seen it follow dysentery, and that he has known it to coëxist with epidemic catarrh. Chomel gives a case in which it was complicated, at its commencement, with acute pneumonia. Erysipelas sometimes occurs in the course of the disease.

[1] Louis on Typhoid Fever, vol. i. p. 134, 2d ed.

ARTICLE III.

PERITONITIS.

There is one other accident liable to occur in the progress of typhoid fever, of which it is necessary to speak more particularly. I mean acute inflammation of the peritoneum, occasioned by the discharge into its cavity of the contents of the small intestine, through a perforation. The lesion itself has already been described. It was first fully investigated, its nature and causes pointed out, and its diagnosis established by Louis.[1] In a majority of instances, it takes place in cases of moderate severity, or in those which have been described as *latent*, and at a late period of the disease. Its occurrence is marked by the sudden supervention of acute pain in the abdomen. This pain comes on, all at once, with no premonitory symptoms, with nothing in the condition of the patient to account for it, and the suffering which it occasions is excessive. The access of the pain is frequently accompanied by chills, the abdomen becomes rapidly and acutely tender on pressure, and if it was not so before, hard and tympanitic. The pulse is quick and compressed. An instantaneous change takes place in the physiognomy of the patient. The countenance is expressive of intense suffering, the features are pinched and cadaverous, and the face is covered

[1] Memoires sur diverses Maladies, Paris, 1826, p. 156, *et seq.*

with a profuse sweat. There is a constant and urgent desire for cold drinks. Nausea and vomiting are present, soon after the inflammation has commenced; the matter ejected from the stomach is of a grass green color, and it continues to be thrown up to the last moment of life. Notwithstanding the constancy and the intensity of the distress, the patient preserves the same position, lying upon his back, and dreading every movement that may add to the pain and tenderness of the abdomen. Such, in most cases, is the formidable array of symptoms, which indicate the occurrence and mark the progress of this fatal complication. Occasionally they are more obscure; and this peritoneal inflammation, like the fever itself, is, to a certain extent, latent. It is exceedingly rare, however, that there can be any difficulty in ascertaining its existence. Death usually takes place in from one to three days after the occurrence of the perforation.

ARTICLE IV.

RELAPSES.

It seems to be very well settled, that true relapses, as they are called, not unfrequently occur in this disease. Dr. Jackson remarks, that an error in diet and regimen is often followed by a new train of symptoms, after convalescence from typhoid fever; and that they appear to be such symptoms as belong to the fever, although not always so strongly characteristic as to leave no doubt on the

subject. He cites a case in which, during the relapse, there was an eruption of the rose spots. Dr. Stewart reports two cases, wherein amongst many other of the more peculiar symptoms of the disease, the relapses were also attended by a reappearance of the typhoid eruption.[1] Indeed, there are, probably, few physicians extensively conversant with typhoid fever, who have not, more than once, seen convalescence fatally interrupted by a sudden return or an aggravation of many of the most characteristic symptoms of the disease, the delirium, the diarrhœa, the subsultus, the tympanites, and so on; constituting, not the supervention of a new, accidental affection, but a genuine relapse.

CHAPTER VII.

DIAGNOSIS.

It is only since the publication of the work of Louis, by the aid of his and of subsequent researches, that typhoid fever has been distinguished, with any considerable degree of constancy and certainty, from other more or less analogous forms of disease. And even now, there are few problems in diagnosis more complex than this; although, by the

[1] Edinburgh Med. and Surg. Journal, Oct. 1840.

application of the requisite knowledge and care, its solution is almost always attainable. The elements which enter into the composition of this problem are many and various. There is no one symptom, there are no two or three symptoms, which, in themselves, are characteristic of the disease. There is no one symptom, there are no two or three symptoms, usually occurring in the disease, which may not be absent during its entire progress. Our diagnosis can never be founded here, as it is in many other instances, on a few positive, physical signs. It must always be rational, not absolute. The evidence, upon which our verdict is to be rendered, is wholly circumstantial. Notwithstanding all this, and although cases sometimes occur, so enveloped in obscurity as to baffle the skill of the most careful and experienced observers; it is still true, that there are few general diseases, the diagnosis of which is so well established, and so certain, as that of typhoid fever.

Perhaps, in the present state of science, a single qualification ought to be affixed to this last remark. The whole question of the diagnosis of the several, individual diseases, constituting the family of idiopathic or essential fevers, has been undergoing, ever since the publication of the work of Louis, a more rigorous and philosophical scrutiny than it had been subjected to before. Much of the chäotic confusion, in which this question had always been involved, has been cleared up. Diseases, which had occupied distinct, and perhaps widely sepa-

rated places in the nosologies, have been shown to be identical; and diseases, on the other hand, have been shown to be widely different in their character, which had been regarded as identical. Some of these questions of difference and identity are still unsettled; they are matters not yet finally and definitively disposed of; not yet ranked amongst the established principles of medical science. One of the most important and interesting of these, and this constitutes the qualification which I wished to make, is that of the differences between the disease now under consideration, and the true typhus fever. By many pathologists the two diseases are considered to be essentially alike, identical. Until within a few years, this was the general opinion; and, even now, it is almost universally entertained by the British physicians, who have enjoyed the most extensive opportunities for studying and comparing the two diseases, or the two forms of disease, as the case may be. By other pathologists these diseases are considered to be essentially and fundamentally unlike each other; unlike in their nature; in their symptoms; in their pathology; and in the mode of management which they require. I believe this last opinion to be the true one; but it cannot be satisfactorily discussed until both diseases have been described. For this reason, I shall omit, in what I have now to say upon the diagnosis of typhoid fever, the consideration of the differences between it and the true British typhus.

Setting aside, as I do for the present, the true

typhus fever, there is no disease more readily and positively recognised, than a case of well marked typhoid fever, of extreme or even of average severity; when observed from its commencement, and followed through its entire course. It is hardly possible to confound it with any other affection. There is no other, in any considerable degree, resembling it. Chills, more or less severe, repeated or not; accompanied with, or immediately followed by headache, and pains in the back and limbs; these pains subsiding and disappearing in the course of a few days; thirst; heat of the skin; acceleration of the pulse, with an evening exacerbation; entire loss of appetite; great muscular debility; dullness and confusion of the intellect, passing gradually into delirium; restlessness; vigilance, or somnolence; twitching of the tendons, or picking at imaginary objects; occasional epistaxis; ringing or buzzing in the ears; the appearance of a scattered, rose-colored eruption, principally upon the skin of the chest or abdomen, during the second week; a dry, glutinous, cracked, red, brown or blackish tongue, protruded with difficulty, and trembling; dark, thick sordes upon the teeth; diarrhœa, the stools thin, watery, and dark or yellowish, sometimes consisting of blood; tympanitic distension of the abdomen; dullness on percussion over the spleen, and gurgling upon pressure upon the right iliac region; with a dry sibilant or sonorous rhonchus over the chest; these symptoms, coming on without any obvious cause, occurring in a

person under forty years of age, and referable to no local disease; more or less regularly and successively developed; increasing in severity, and terminating in death at an indefinite period after the eighth day; or gradually subsiding and disappearing, one after another, and giving way to convalescence at an indefinite period after the fifteenth or twentieth day; mark, most clearly and unequivocally, a disease wholly unlike any other. These symptoms are sometimes, during the progress of the disease, and in various degrees of relative severity, all of them present; and in these cases, at any rate, there is no possibility of mistaking typhoid fever for any other disease. The diagnosis, independent of the evidence to be derived from the lesions found after death, in the fatal cases, is easily and certainly made.

In other instances, many of the foregoing, and amongst them some of the most characteristic symptoms may be wanting; and still the diagnosis may remain in no way difficult or doubtful. Some of the most serious disturbances of the nervous system may be absent. There may be no morbid watchfulness or drowsiness; no aberration of the mind; no twitching of the tendons; but if the other symptoms, above enumerated, are present, there can be no uncertainty as to the character of the disease. Again, it may happen that the abdominal symptoms, the diarrhœa and tympanitic distension, may be wanting, without throwing any doubt upon the diagnosis. We may go further than this. Let us

suppose that a person, between the ages of fifteen and thirty, is attacked, without any appreciable cause, by the febrile symptoms already repeatedly described; attended or followed by loss of appetite; sufficient prostration of muscular strength to confine the patient to his bed; occasional epistaxis; slight dizziness or ringing in the ears, at least on assuming the upright position; and that these symptoms cannot be referred to any local disturbance, and persist for as many as twelve or fifteen days, with but little change, and not much influenced by medicine; even under these circumstances, there can be but little question as to the disease. In most cases, there will be found at least as many elements of diagnosis as in that just supposed; in very many there will be more. Almost always the lenticular eruption will be discovered, if it is timely and carefully sought for; if there is no diarrhœa there may be slight distention of the abdomen, with gurgling on pressure over the region of the cecum; or there may be deafness, or sluggishness of the mind, or transient and wandering delirium, or, finally, some one or two of the numerous symptoms, more or less characteristic of the disease.

I do not mean to say by this, that typhoid fever can always be distinguished with certainty from other diseases, even when it is watched during its whole course, and by the best observers. Unquestionably, the disease is sometimes so nearly latent, or so poorly defined, as to be overlooked or mistaken; but with ordinary knowledge of its charac-

ter, its symptoms, and their march, and with careful examination, this will very rarely be the case.

It may happen, not unfrequently, that the disease cannot be positively made out during the first few days after its access. The febrile symptoms, the chills, heat, thirst, accelerated circulation, with the pain in the head and limbs, are amongst the most prominent at this period, and they are those least characteristic of this disease. They are indeed common to the early period of this and of many other febrile affections, and of the local phlegmasiæ; so that until the subsequent and more distinctive and peculiar symptoms of the disease, whatever this may be, show themselves, it may not be possible to establish our diagnosis. In the same way, it may happen, that the disease is not seen till it has reached its late stage. Many of its most important diagnostic characters may have disappeared, and no satisfactory history of its anterior progress can be obtained. Under such circumstances it may sometimes be confounded with other affections; with dysentery in its late stages; with some diseases of the brain; and with local inflammations, which are strongly marked, especially near to their fatal termination, with what may be called the *typhoid element* in pathology. Louis once mistook a case of central softening of the brain, occurring in a boy, for typhoid fever. Erysipelas is often attended with many of the symptoms of this disease; delirium, drowsiness or stupor, red or brown and dry tongue, fuliginous teeth and gums, tympanites,

and great prostration of strength; so that were it not for the presence, from the commencement, of the cutaneous inflammation, it might sometimes be confounded with typhoid fever.

I have said nothing, thus far, of the lesion of the elliptical plates, as an element in the diagnosis of the fatal cases. It has already been remarked, that this lesion is characteristic of this disease; that it is invariably found in the fatal cases of typhoid fever; and that it is not found in fatal cases of any other acute disease. If this is absolutely true, without exception and without qualification, then the presence or the absence of the lesion ought to be final and decisive in regard to the diagnosis. Let us see what the evidence is upon this matter. I have already spoken of one case, which was regarded by Louis as typhoid fever during life. A post mortem examination showed that the elliptical plates and mesenteric glands were healthy, and that death was the result of softening of the central portions of the brain. This, then, was, manifestly, not a case of typhoid fever. Not only were the usual lesions of this disease wholly wanting; but all the symptoms and the fatal result were sufficiently accounted for by the cerebral lesion. This was a case of disease of the brain, simulating, to a certain extent, typhoid fever. And even here, it is but justice to say, that Louis now considers his diagnosis to have been precipitate; the diagnosis of a similar case, occurring at the present time, would, to say the least of it, be qualified and doubtful. Another case

is recorded by Louis, in the first edition of his work, which was marked by most of the symptoms of typhoid fever, and on examination after death no lesion was found in the elliptical plates or the mesenteric glands. But here, again, it is important to remark, that the case occurred in 1823, when the diagnosis of typhoid fever was more doubtful than it is at the present time; and, furthermore, that the patient was not seen by Louis till the twentieth day of his illness. If to these circumstances it be added, that there was extensive, ancient disease of one of the kidneys, fatty liver, and considerable effusion under the arachnoid membrane, and into the lateral ventricles; certainly we are justified in concluding, not that the case was one of typhoid fever, but that the diagnosis was incorrect. The second edition of Louis's work was published in 1841. In that it is said, that no single new case, constituting even an apparent exception to the uniform relationship between the group of symptoms upon which the diagnosis of typhoid fever rests, and the abdominal lesion, had then been met with, either by Louis himself, Chomel or Bouillaud. One case is briefly reported by Fouquier, which occurred at La Charité, in 1833, in which the symptomatology of typhoid fever seems to have been pretty clearly marked, and in which the elliptical plates and the mesenteric glands were found almost free from disease.[1] The strongest case, however, which

[1] Journal des Connaissances Médicales, Jan. 1834.

I have been able to find, of apparent exception to the law of relationship, now under consideration, is reported by Prosper Dor. It occurred, at the Hotel Dieu of Marseilles, in 1833. The patient was eighteen years old, and died on the eighth day of the disease. There were these symptoms, headache; debility; loss of appetite; sleeplessness; then, epistaxis; great prostration of strength; soft, irregular pulse; dry, blackish tongue; sordes on the teeth; meteorism; diarrhœa; delirium; *subsultus tendinum*, and picking at the bed clothes. There was no cutaneous eruption. Certainly, in this case, the diagnosis, during life, would have been sufficiently clear and positive. An examination, after death, showed the intestines to be healthy, but it showed, also, extensive disease of the urinary apparatus. The mucous membrane of the bladder was encrusted with a layer of urate of lime, and in the left kidney there was a considerable number of purulent depositions. Now, when it is considered, that diseases of these organs are very frequently attended, near to their fatal termination, with strongly marked *typhoid phenomena*, there can be no hesitation, I think, as to the disposition, which ought to be made of the foregoing case; no difficulty in assigning to it its proper position. It was clearly not typhoid fever; but an instance of disease of the urinary apparatus, in which the typhoid symptoms, which often accompany the latter stages of the affections of this apparatus, were more

numerous, and more closely resembling those of typhoid fever than is often the case.

I have been permitted, through the kindness of Dr. Hale, and Dr. J. B. S. Jackson, of Boston, to look over the notes of a case which occurred, during the last year, in the Massachusetts General Hospital; and which might seem to constitute an exception to this relationship. The patient was twenty-two years old. He entered the hospital on the 23d of June, 1841, after an illness of two weeks; during the first half which time he kept about his work. He had pain in the head, back and limbs; dizziness; *tinnitus aurium;* prostration of strength; loss of appetite; daily, spontaneous diarrhœa; abdominal pain, and epigastric distress; tenderness over the right iliac region; rigidity of the muscles, and tympanitic distention of the abdomen; epistaxis; the rose-colored spots and sudamina. He died on the 8th of August, having exhibited, for some time, symptoms of severe gastritis. The mucous membrane of the stomach was mamelonated, red, thickened, and ecchymosed; there was ulceration of the mucous membrane about the fauces and root of the tongue; and the only alteration of the elliptical plates of the ileum consisted in their great distinctness and perhaps a slight thickening, with a bright, spotted, ecchymotic redness of two of the plates; one of them two feet and the other four feet from the ileo-cecal valve. One or two others were similarly affected, but in a

slighter degree. A portion of the ileum, nearly a foot in length, extending to within six inches of its lower termination, was deeply ecchymosed, in bands running round the intestine. A single mesenteric gland, directly opposite to the ileo-cecal valve, was nearly as large as the end of the thumb, red and soft. The other glands were scarcely at all enlarged. The spleen was of medium size.

This case seems to me to be one of great interest, and susceptible of an obvious and ready explanation. The patient died of gastritis, eight weeks after the accession of typhoid fever. There is no evidence that the primary affection here was of unusual gravity; there is no good reason to think that positive ulceration of the intestinal follicles usually takes place in mild cases, and perhaps not, in many of moderate severity; and in the one before us, supposing such to have been the case, sufficient time had elapsed, from the commencement of the disease, to account for the moderate degree of alteration in the elliptical plates and the mesenteric glands. It was a case of typhoid fever, I think, of moderate severity; the patient dying of gastritis, at so late a period, that the entero-mesenteric lesion had in good part, but not entirely, disappeared.

In the discussion of this question, great stress has been laid upon the observations of Andral, by those who deny or doubt the constancy of the connection between the diagnostic symptoms of typhoid fever and the peculiar lesion of the elliptical plates.[1]

[1] Andral's Clinique Médicale, vol. III. p. 222 to 274, 2d ed. Paris, 1830.

A very cursory examination, however, of the facts cited by this distinguished writer, will show, conclusively, that they justify no such inferences as have been deduced from them. The cases, which he has reported, are fifteen in number. He arranges these in two classes; the first consisting of cases of what he calls continued fever with gastro-intestinal lesions, but without any alteration of the elliptical plates; the second consisting of cases of what he calls continued fever, without any appreciable lesion of the digestive tube. In the first class are contained the histories, generally short and incomplete, of seven patients. The fifth, sixth and seventh are the only ones amongst them that can be considered even doubtful. The others are clearly enough not typhoid fevers; in most of them there was not present even the *typhoid state*. The sixth case looks like the true, petechial typhus, although the history of the patient is too imperfect to justify any confident diagnosis. The seventh case appears to have been one of pneumonia, complicated with erysipelas, following upon simple enteritis, and marked by typhoid phenomena. Certainly, there is not one amongst them which, with our present means of diagnosis, would be regarded, with any degree of certainty, before death, as a case of typhoid fever.

An examination of the eight cases, included in the second class, is still more conclusive in its bearing upon the question now before us. There is not one amongst them, the diagnosis of which,

so far as typhoid fever is concerned, can be looked upon as even doubtful. It is hardly too much to say, that neither of them could now be taken, by any possibility, for a case of typhoid fever. I will briefly enumerate the diseases. The first, case forty-sixth of the volume, was phlegmonous erysipelas of the arm, occurring in a soldier, thirty-five years of age; the second was gangrene of the right leg, in a patient fifty-three years old, suffering with organic disease of the heart; the third was inflammation, either chronic or acute, of the right kidney, and the mucous membrane of the bladder, in a patient sixty years of age; the fourth was extensive suppuration of the prostate gland; the fifth was latent pnemonina, in a woman eighty-one years of age; the sixth and seventh were affections of the brain, one of them in a patient eighty-one years old; and the eighth was gangrene of the lip, accompanied with extensive phlebitis and numerous purulent depositions in the lungs. This simple statement of these cases precludes the necessity of any further remarks upon them. Manifestly, they have no connection with the question of relationship between the usual symptoms of typhoid fever and the alteration of the elliptical plates of the ileum; and yet they have been, more perhaps than any others on record, relied upon to prove the want of any constancy in this relationship. It is certainly very important, that this *typhoidal* state of the system, occurring in connection with many diseases, should be distinguished from typhoid fever.

Unless this is done there is an end to all positive and philosophical diagnosis. Since writing this history, I have seen a patient presenting these phenomena, amongst others; prostration of strength; slight *subsultus tendinum;* tympanites distention of the abdomen; diarrhœa; gurgling on pressure; a dry, red, cracked tongue; sordes on the teeth; wandering delirium, and sudamina about the neck. Here were many of the most characteristic elements of typhoid fever; but the disease was, clearly and unequivocally, puerperal peritonitis. These *typhoid phenomena*, as I have already said, are often present in many diseases; in small pox; in scarlatina; in asthenic pneumonia; in softening of the brain; in some diseases of the kidneys; in erysipelas; in dysentery, and so on; but under these circumstances, where their connection with these several affections can be discovered, they ought not to be confounded with typhoid fever. It was from disregarding this obvious principle, that Andral was led to the conclusion which I have been examining.

Barthez and Rilliet, in the course of some observations on the disease as it occurs in children, published in the *Journal des Connaissances Médico-Chirurgicales*, for 1841, report one or two apparent cases not attended by the characteristic lesion.

In the consideration of this question, as of all others, which are still legitimate subjects of discussion and controversy, I have sedulously endeavored to avoid any thing like a partisan, or one-sided examination. I have not intentionally overlooked, or

put aside, or warped to my mere wishes, if I have any such unfriendly and treacherous guides and counsellors in the search for truth, any of the evidence bearing upon the subject. I have adduced all the cases, that I have been able to find, which might seem to constitute exceptions to this general relationship, or to throw doubts upon its invariableness; and the conclusion to which I am irresistibly led is this; that the connection between the diagnostic symptomatology of typhoid fever, and the entero-mesenteric lesions, is, I will not say absolute and invariable, but as nearly so as the connection between the diagnostic symptoms, and the characteristic lesions of any given disease, whatever, in the nosology, in which this connection is not established by positive, physical signs.

CHAPTER VIII.

MORTALITY AND PROGNOSIS.

Typhoid fever must be considered, on the whole, as a grave disease. I have already had occasion, in treating of its different forms and varieties, to give some instances of its rate of mortality, in different easons and places. This depends so much upon

the character of the disease in any particular locality, and during any given period, that it is not an easy matter to arrive at any positive and accurate general or average result. The prognosis, as well as the diagnosis, of this disease, is a complex problem, into the solution of which, in each individual case, there enters a great number of phenomena. Instead of going any further into the question of the average and varying mortality of the disease, I will now endeavor to appreciate, as far as this can be done, the value of the several elements, which go to make up our prognosis. In doing this, I shall first briefly pass in review, and as nearly as this can be done, in the same order in which they have already been described, the several symptoms of the disease; and I will then speak of some other considerations connected with its degree of severity and consequent danger.

The mode of invasion would seem to have no small degree of influence upon the subsequent character of the disease. This has been particularly shown by the investigations of Chomel. In his wards at the Hotel Dieu, of seventy-three cases in which the access was sudden, only twenty-six were fatal; while there were twenty deaths in only thirty-nine cases, in which the access was gradual.

The strictly febrile symptoms are not, in themselves, of much value in prognosis. A pulse more rapid than 120 or 130 in the minute, constitutes an unfavorable sign; especially if associated with any

other grave symptoms. Still it frequently happens, that cases recover in which this rapidity of the pulse has been present for a considerable period of time. In 290 cases, cited by Dr. Jackson in his Report, the average frequency of the pulse in those which recovered was, in round numbers, about twenty in a minute less than in those which ended fatally. It was also from fifteen to twenty in the minute more frequent in females than in males. Dr. Jackson remarks, in his Report, that he has not found chills, at an advanced or late period of the disease, to have been followed by very grave consequences, though he had previously had a different impression. Of twenty-nine cases, in which these chills were noted, only two terminated fatally. Louis says, that they indicate the commencement of some secondary lesion.

The noisy, hissing and irregular respiration, to which I have applied the term *cerebral*, is a very dangerous indication; and, as is said by Chomel, when connected with other grave symptoms, renders the case almost utterly hopeless.

Delirium, especially if it occurs at an early period, and is of a wild and violent kind, is of very bad augury. Many patients, in whom it comes on late, and in whom it is of a mild, muttering character, recover. Of 108 cases, mentioned in Dr. Jackson's Report, this symptom was present in two cases in seven of those which terminated favorably; and in four cases in five of those which terminated unfavorably. Transient and slight delirium, occur-

ring during the night, or immediately after waking from sleep, and easily dissipated by attracting the attention of the patient, cannot, in itself, be regarded as a very serious symptom. There is a peculiar perversion of the mind, occasionally seen, the presence of which indicates great and imminent danger. This consists in a feeling, on the part of the patient, that he is not much sick; when he says, even in the midst of the gravest symptoms, that he feels and that he is very well. Louis says, that he has never known this state of the mind in a patient who recovered.

Somnolence and coma are unfavorable symptoms in proportion to their degree, and to the early period of their access. If they are present at or near the beginning of the disease, and are at all strongly marked, they are very constantly followed by a fatal termination. Moderate sleepiness or stupor, from which the patient is pretty readily roused, is common in cases of moderate severity; but prolonged and profound coma indicates a very formidable grade of the disease. Watchfulness, restlessness, and agitation are, also, unfavorable symptoms. Deafness and epistaxis, are, neither of them, of any considerable importance as prognostic signs. They occur with nearly the same frequency, and to nearly the same extent, in grave and in mild cases. The same thing is true of dizziness and noises in the ears.

Spasmodic contractions of the muscles, either of the face, or of the arms and hands, constituting

subsultus tendinum, or of other parts of the body, are of grave omen. They occur very much more frequently in cases which are fatal than in those which recover. According to Dr. Jackson's Report, they were noted, at the Mass. Gen. Hospital, in one case in a little less than four, of those which terminated unfavorably; and in one case in ten of those which terminated favorably. If these contractions are general and strongly marked, constituting a kind of epileptiform agitation of the whole body, or of all the limbs, the case is almost invariably fatal. Such is also the case, where there is permanent rigidity of one of the limbs. Louis has never seen a case of this sort recover; and he says, that he knows of no one amongst his contemporaries, except Chomel, who has. Dr. Jackson reports six cases, in which this symptom occurred, only one of which ended in recovery. Early and extreme prostration of strength is likely to be followed by a grave and dangerous form of the disease.

The expression of the countenance may sometimes be of service in our prognosis. It is hardly necessary to say, that the pinched, cadaverous, Hippocratic face generally indicates speedily approaching dissolution. On the other hand, the reappearance of intelligent expression on the features from which it had long been banished; the re-illumination of the dull and listless eye; the recognition by the patient of his friends and attendants; accompanied by the manifestation of interest in his own situation and safety, and in surrounding

circumstances, are, even in the midst of many grave symptoms, cheering indications of a change that will end in recovery.

The appearance of the tongue is of less importance as a prognostic sign than has generally been supposed. It is worth something, but in itself, not a great deal. A very dry, cracked, red or blackish tongue is more unfavorable, certainly, than one that is moist, with a thin, brownish or yellowish coat; but the former appearances are not unfrequently present in cases which recover, and unless accompanied with other grave symptoms are not much to be regarded.

Difficulty of swallowing, especially if great, is an unfavorable sign.

Meteorism, or tympanitic distention of the abdomen, constitutes an unfavorable symptom only when it is strongly marked.[1]

Diarrhœa, if urgent and continued, is a grave symptom. It is much more constantly present in severe and fatal cases, than in mild ones, although patients often recover who have suffered greatly and for a long time with it. Nathan Smith says, "The danger of the disease is in proportion to the violence of the diarrhœa; when the patient has not more than four or five liquid stools in the twenty-four hours, it is not alarming; as it does not seem to weaken him much; but if they exceed that number, serious consequences may be appre-

[1] Louis on Typhoid Fever, vol. ii. p. 341, 2d ed.

hended. I have never lost a patient, whose bowels continued constipated through the whole course of the disease, and have never known a fatal case of typhus, unattended by diarrhœa."

Involuntary discharges from the bowels rarely take place except in the late stage of very severe cases. Of course they point towards an unfavorable termination, although they are far from indicating with any certainty such a result. Of thirty cases, in which this symptom was present, mentioned by Chomel, thirteen ended in death. Of ten cases, cited by Dr. Jackson, only four recovered.

Hemorrhage from the bowels is a grave symptom, though far from an invariably fatal one. Of seven cases cited by Chomel, all but one terminated unfavorably. The experience of others, however, is less discouraging. Of seven cases mentioned by Louis, three were fatal; and of thirty-one cases, occurring in the Massachusetts General Hospital, eleven only terminated unfavorably. I have certainly seen as many instances of recovery as of death in patients who have suffered from this accident. I do not know that the quality of the intestinal discharges, in any other respect, has anything to do with the danger of the disease.

Retention of urine is an unfavorable symptom. Of six cases, in which it was present, at the Massachusetts General Hospital, three were fatal.

Erysipelas occurs oftenest in the course of severe and alarming cases. It not only indicates a grave form of the disease, but it adds, also, to its danger.

The rose spots occur with like frequency in all grades of the disease, and are destitute, of course, of any prognostic value. The same remarks may be made of eschars upon the sacrum as have just been made in regard to erysipelas.

Before leaving this consideration of the several symptoms of typhoid fever, in their relation to prognosis, it is important to notice one other circumstance of occasional occurrence, bearing upon this subject. It sometimes happens, that a very well marked amelioration of all the symptoms takes place, somewhere, usually, between the tenth and twentieth days of the disease; constituting indeed an apparent convalescence; and that this amendment is soon after followed by the return, in an aggravated form, of the symptoms which had subsided, or diminished in severity. This species of relapse is almost invariably followed by death. This circumstance is particularly noticed by Chomel, and the truth of his remarks is corroborated by Louis.

Besides the foregoing, there are some other circumstances, which affect, in a general way, the question of prognosis in typhoid fever. The principal of these are age, season, and acclimation.

Speaking now of adult patients, that is of those over fifteen years old, it seems very certain, that the danger to be apprehended from this disease, is somewhat in proportion to their increased age. The mortality is smaller between the ages of fifteen and twenty than it is between the ages of twenty

and twenty-five; or than it is at any subsequent period of like duration. The mortality at the Hotel Dieu, in Chomel's wards, was one in five, between the ages of fifteen and twenty; one in four, between the ages of twenty and twenty-five; and one in two, over the age of thirty-five. Louis and Chomel agree in saying, that they have rarely found cases to terminate fatally, where the patients were between the ages of fifteen and seventeen years. At the Massachusetts General Hospital, Dr. Jackson found the average age in the fatal cases to be a little more than two years greater than in the cases not fatal. He found, also, upon a further analysis, that in those patients whose ages were thirty-five years or more, the mortality was one in four; while in those whose ages were twenty years or less, it was only one in nearly eleven. The prognosis is more favorable amongst children than amongst adults.

It would appear, from the observations of Chomel, that typhoid fever is more grave and fatal in the cold than it is in the warm season. At the Hotel Dieu, in 1832, the mortality was one in three during the winter, and one in six during the summer; in 1834, it was one in two and a half during the winter, and one in seven during the summer; and in 1835, the average proportions were the same as in 1832. An exception to this general result occurred in 1831, when the proportion of deaths was one in four during the winter, and one in three during the summer. The number of cases, however, in the hospital, this year, was small. Chomel

appears to have no doubt as to the influence of season upon the severity and mortality of the disease.[1] I do not know how far his conclusions are sustained by the observations of others. The most fatal form of the disease, that has ever been witnessed in the city of Lowell, prevailed during a winter of extreme severity.

It seems, also, and this principally from the results obtained by Chomel, at the Hotel Dieu, that the length of time, during which patients have resided wherever they suffer from the disease, has some influence upon its mortality. Between the first of November, 1834, and the first of August, 1835, there were ninety cases of typhoid fever in Chomel's wards at the Hotel Dieu. Amongst those, patients, who had resided in Paris less than one year, the mortality was one in three ; amongst those who had resided in Paris between one and two years, the mortality was one in five ; and of fifteen, who had resided in Paris more than two years, only one died. There is reason to think, that this result is not accidental, since the same differences, though to a less striking extent, were noticed during the three previous years, and since they are also in keeping with the observations of Louis.[2]

There is no evidence, that the supposed, occasional, exciting causes of typhoid fever, such as scanty and poor diet, depressing emotions, fatigue and excesses, have any effect upon the severity and fatality of the disease.

[1] La Lancette Française. August, 1835. [2] Ibid.

It must be obvious enough, from all the foregoing considerations, that the prognosis, in any given individual case of typhoid fever, can very rarely, if ever, be absolute and positive. Patients sometimes recover from the most desperate condition; they are liable to the most dangerous and fatal accidents in the mildest cases. But, notwithstanding these contingencies, we may, in a great majority of instances, by a careful study of all the circumstances which can influence the result, arrive at a good degree of approximative certainty in our prognosis. In a moderate proportion of cases the scales of life and death may hang, for many days, so far as we are able to see, in almost exact equilibrium; and no foresight or sagacity can predict, with any degree of confidence, which of the two will finally preponderate. Favorable and unfavorable symptoms will be so combined, and so attempered, as to baffle all the efforts of wisdom and experience to calculate their issues. Hope and Fear are constant and equal watchers by the bed-side of the sick. In all the rest, however, the general character of the symptoms will be, one way or the other, so marked and so decided, as to enable us to judge, with a reasonable degree of certainty, as to the result. If during the first fortnight, the pulse is not more than 100 or 110 in the minute; if there is only moderate drowsiness; if there is no delirium, or even if this, though present, has not appeared at an early period of the disease, and is easily dissipated, or mild in its character; if there is no twitching of the tendons;

if the patient gets some comfortable sleep; if the diarrhœa and tympanitic state of the abdomen are moderate in degree; the chances of recovery are vastly in favor of the patient. Bearing in mind the liability, which always exists, to a sudden aggravation of the symptoms, to the supervention of some secondary complication, and to the occurrence of intestinal perforation, and the qualification necessarily accompanying this liability, we may, in such cases, with great confidence, anticipate a favorable result. On the other hand, if the pulse is more than 110, or 120 in the minute; if there is great stupor or coma; if the delirium comes on early and is wild and furious; if there are spasmodic contractions of the muscles, picking at the bed-clothes and great prostration of strength; if there is restlessness or agitation; if the diarrhœa is urgent and continued; if the distention of the abdomen is extreme; if the odor from the patient is musty and cadaverous; if the features are pinched and Hippocratic; especially if there are general epileptiform convulsions, or permanent rigidity of one of the limbs; or that peculiar perversion of the intellect, which leads the patient, in the midst of this terrible combination of threatening circumstances, to suppose and to declare himself free from suffering and danger; if these symptoms, or any considerable number of them are present, we can have very little ground to look for any but a fatal termination; and this termination we may, with great confidence, predict.

CHAPTER IX.

THEORY OF TYPHOID FEVER.

The most positive thing that can be said, under this title is, that the materials for a complete and philosophical *theory of fever*, or *theory* of any individual fever, using this phrase in its ordinary acceptation, do not exist. Such a theory presupposes and involves a knowledge of the intimate processes and relations of the living powers, which has not yet been attained. It is very questionable even, whether such knowledge is attainable.

In order to see clearly the truth of these observations, and the extent of this truth, let us inquire, for a moment, what *some* of the elements are, which must go to make up this knowledge; what their nature is, and in what they consist. In the first place, we must know what the actual, efficient causes of any given fever, or form of fever, are. We must know what that agency, or combination of agencies, is, which, being present, brings into existence, originates, sets in motion, that concatenation of disordered actions, that complex combination of morbid processes, which constitutes the fever. We must know in what manner these agencies act; where they make their impression; and in what the modifications consist, which they work in the living organization, and its properties.

Of all these things we are utterly and profoundly ignorant. In the second place, we must know the seat and character of all these processes and modifications themselves; their peculiarities; their tendencies; the differences which exist between them in the several forms of febrile disease. We must know their relations to each other. We must know which amongst them are primary and essential; which are secondary and accidental. We must know the parts which they severally play in the production of the integral disease. Of these things, also, as of the causes of fever, and their mode of action, it is not too much to say, that if we are not wholly and profoundly ignorant, we are so to a great extent. They are but very partially and imperfectly known to us. They are known to us, rather analogically, if I may so speak, and by comparison with other morbid processes, than absolutely and positively. We can see wherein they differ, in many respects, from these other processes, and wherein they resemble them. With these limitations, and under the conditions implied by these remarks, there is no reason why we may not attempt to commence the foundation of a *theory of fever*. But, in the present state of science, it can only be an attempt at a commencement. We may endeavor to interpret the connection and relationship, which observation has shown to exist between certain phenomena, or groups of phenomena. We can do nothing more.

It ought to be unnecessary to say, that even this

can be done only by confining ourselves to a single well defined, individual form of fever. Under the simplest conditions, and where alone it is, in the nature of things, at all possible, we shall find this interpretation, or theory, sufficiently obscure and difficult. When attempted, as has generally been the case, under other conditions, it has proved utterly futile; when applied, as these interpretations and theories have generally been applied, to unascertained and imaginary states of the system, they have always degenerated, necessarily, into the idlest of all conceivable speculations. There is no such disease as that which has always been expressed, and which is still expressed by the term *fever*. How then can there be any *theory* of fever? There are many separate diseases, to which this generic name is properly enough applied, on account of certain general analogies, which exist between them. But the disordered actions and processes, which constitute one of these diseases, may differ essentially; and, as far as we can ascertain, in most cases they do so differ, from those which constitute another of these diseases. The theory of one fever, then, must be wholly, or to a great extent, inapplicable to another. The elements which enter into the composition of one problem are not to be found in the other, or they are present in different proportions. The word *fever*, when used, as it commonly is, to designate a disease, has no intelligible signification. It is wholly a creature of the fancy; the offspring of a false generalization

and of a spurious philosophy. What, then, can its *theory* be, but the shadow of a shade?

If the true theory of disease be such as I have represented it, we should naturally look, in its application to any individual and separate form of disease, first and principally, to those phenomena, which are most constantly present, and which seem to constitute its most important elements. According to this rule, and in relation to the subject immediately before us, the theory of typhoid fever, the first inquiry would naturally be, what is the nature, and what are the relations of its characteristic lesion, that of the elliptical plates of the ileum. A satisfactory answer to these questions would so far settle the theory of the disease.

What is the nature of this alteration of Peyer's glands? Does it consist in an inflammatory action and its results? If so, is the inflammation common and simple; or has it something peculiar and specific in its character? We can hardly hesitate, I think, in attributing this lesion to inflammation. We know nothing of any other morbid process that can produce similar results. In its early stages we find the tissues which are its seat, tumefied and reddened; subsequently, ulceration takes place; and if life is not destroyed, there is abundant evidence, that the restorative process is set up and the lesion removed by complete cicatrization. Their enlargement, softening, redness, and, in some instances, the presence of pus in their substance, are equally sufficient proofs, that the affection of the

mesenteric glands is, also, of an inflammatory character. But, as to the second point, it seems to me, that all the analogies in pathology tend to show, that this inflammation is not common, but specific. It is circumscribed, and not diffused, as ordinary inflammation of the mucous tissues usually is. It does not often lose itself gradually, shading off into healthy membrane. The morbid process almost constantly extends to the subjacent cellular membrane, which is almost never the case in common mucous inflammation of an acute character. Its tendency to rapid ulceration, and the appearances of some of its morbid products, would also seem to show, that it has something special and peculiar in its nature. Is it not also philosophical and fair to infer something in corroboration of these views from the observations of Andral and Gavaret in regard to the condition of the blood in different diseases? They have found, from extensive and careful examination, that in all diseases consisting of common, open, frank inflammation, in any of the organs; or complicated with such inflammation; the relative quantity and proportion of fibrine in the blood is increased; while in diseases of an opposite character, and under opposite circumstances, in the exanthemata, for instance, the fibrine either merely maintains its natural proportions, or is diminished in quantity; a condition, as we have already seen, characteristic of the blood in typhoid fever.

In regard now to the relation between this lesion of the elliptical patches on the one hand, and the

disease, considered as a whole, on the other; or, between the lesion and the symptoms; the simplest view to be taken is that which makes the disease consist, essentially, in the lesion; and which refers the symptoms to the lesion as their cause. This doctrine makes typhoid fever, not an essential or idiophatic fever, but an enteritis, or a follicular enteritis, or a dothinenteritis; and assigns to it a nosological position amongst the local phlegmasiæ. This is a modification, merely, of the great doctrine of Broussais; and a modification only so far that it does not include the mucous membrane of the stomach in the lesion. It is still held, partially at least, by some French pathologists of the present day. It has been, strangely and unaccountably enough, even by men who have read his books, attributed to Louis. Dr. O'Brien, of Dublin, in one of his hospital reports, when speaking of this subject, says, "M. Louis, in particular, has adopted the theory of Broussais in its fullest extent."[1] The same misapprehension has been fallen into even by such men as Dr. Christison. It is so far from being true, that Louis has ever adopted the doctrines of Broussais, in relation to the nature of fevers, that no other observer has done so much in overthrowing his peculiar principles. He has ever been the most formidable and successful antagonist of that extraordinary man; opposing in the calm confidence of a truth-loving, and truth-seeking spirit, to the arro-

[1] Dublin Med. Trans. p. 313.

gant assertions, and to the seductive generalizations of the highest genius, maintained and vindicated, as they were, by a strength and an eloquence of language unequaled in the annals of medical literature, the impregnable and serried array of facts and their relations, carefully and positively ascertained. The most obvious objection to this view of the nature of typhoid fever consists in the circumstance, that there is no uniform proportion between the extent of the local disease and the severity of the symptoms. There are many fatal cases in which the intestinal lesion is very limited in extent; there are others where the whole character of the disease has been unusually mild, and in which, when life has been destroyed by some secondary and accidental complication, the alteration of the intestine has been found to be very extensive and profound. This objection, although sound and reasonable, ought not to be considered conclusive. Notwithstanding the exceptions just referred to, it is not certain, that there is not, after all, a general correspondence between the gravity of the local lesion, and the severity of the disease. Besides, even in affections manifestly of a strictly local character, in which the disease consists in the local lesion, it is far enough from true, that there is any thing like an exact and uniform proportion between the extent of this lesion and the general disturbance of the economy. The degree of this disturbance, constituting the general symptomatology, is influenced by a variety of causes, other than the local disease;

so that although we shall find abundant reason, I think, to reject the view of which I am speaking, let us be careful not to do so for false reasons, and on wrong grounds.

I shall now allude to some of the considerations, which go to show, that the local lesion of typhoid fever is not primary but secondary; that, instead of being the single cause and origin of the disease, it constitutes only one of its elements; and is itself dependent upon some other and ulterior morbid condition as *its* cause; the seat, nature, and operation of which are not known to us. It may be observed, that if the view which has been taken of the specific character of the inflammation, entering into the composition of the follicular lesion, be looked upon as sound, it constitutes, in itself, a cogent reason for the correctness of the doctrine above stated. Indeed, it must constitute the principal reason; and in addition to what has already been said upon this subject, I will only present one other consideration, which has been much insisted upon, in support and illustration of the view before us, by Chomel. He says, that one of the most constant and uniform characteristics of secondary lesions, consisting generally of specific inflammations, is the fact of their being *disseminated;* of their occupying numerous and circumscribed spots in the tissues and organs of the system. The most striking examples of this pathological law are to be seen in the eruptive fevers, in measles; scarlatina; smallpox; and the oriental plague. The same law

shows itself, also, in other cutaneous inflammations; in urticaria; in varicella; in the successive crops or furuncles, which are sometimes observed, and so on. It is seen, further, in some affections of a different character; such as scrofula; syphilis; and the several varieties of scirrus and cancer. All these numerous diseases, though they differ very widely from each other, in many respects, have this character in common; that the local inflammations, which accompany them, are *disseminated;* that they occupy a considerable number of defined and limited localities. There are several other particulars, in which the members of this extensive family of disseminated lesions agree with each other; all of which tend to exhibit their specific character, and their subordinate relations. They depend upon specific causes. They cannot be produced at will by any of the ordinary excitants of common inflammation. In many cases these causes are generated by the morbid process itself; and so the diseases are transmitted directly from one individual to another, and are thus perpetuated. In other cases the origin of the cause is unknown. They have, generally, a more or less regular march, and determinate duration; in many instances going through a series of successive stages; and if life is not destroyed in the course of the process, terminating, naturally, in a return to a healthy condition. This march and duration are but very little under the control of art; the first cannot be much modified, nor the second much abridged by the use of remedies; and so far even as these effects

can be produced, they must be produced by means acting, not directly upon the lesions themselves, but upon the general system. Now, in every respect, the intestinal lesion of typhoid fever corresponds to this class of pathological alterations. It is disseminated; occupying the same glandular tissue at different points of the intestinal mucous surface; it cannot be artificially produced by any of the common causes of inflammation; it depends upon a specific but unknown cause; it has a regular march and a determinate duration; passing through its several stages, and terminating, if life is not destroyed, in a return to health; and, finally, this process is but little under the control of art. It is strongly corroborative of the soundness of this view, that in a disease, closely resembling this in many of its symptoms, I mean the contagious typhus, there is no constant local lesion of any sort to which the symptoms can be referred. Certainly, it needs no elaborate argument to show how clearly all these circumstances indicate, that the local lesions in this class of diseases, are peculiar in their nature; secondary and dependent in their relations; constituting, not the primary and essential cause, but only one of the pathological constituents of the particular diseases in which they severally occur.

Some pathologists have adopted the doctrine, that the unknown cause of typhoid fever acts primarily upon the nervous system, producing some unascertained lesion of innervation, which, in its turn, gives rise to disturbances and alterations in the other or-

ganic apparatuses and tissues, and in the fluids; these aggregate disturbances and alterations constituting the disease. This doctrine may be the true one; but in the present state of science it must be regarded as wholly hypothetical; and there are some considerations which militate strongly against its probability.

Another theory is that which places the primary and fundamental alteration in the blood. We may be justified, I think, in saying, that at least this theory has more claims upon our attention, and is more probable than that of which I have just spoken. It is already demonstrated, that in many cases of typhoid fever, and in other diseases, to which it is more or less nearly allied, especially by the common presence in them all of what has been called the *typhoid state*, or the *typhoid element* in pathology, important and peculiar changes have taken place in this fluid. These changes may have been primary and essential. There is good reason to think, at any rate, that they play a very important part in the pathology of these diseases. They deserve further investigation, and they ought never to be overlooked; but their actual relations to these diseases are very far from being ascertained. In another class of affections, the acute phlegmasiæ, we find important alterations in the composition and character of the blood, which are, very evidently, the result of the disease; they are secondary and not primary in their relations. Such may be the case, also, in typhoid fever, and its analogous diseases. I am dis-

posed to look favorably upon this partial return of the old humoral pathology, and to hope much from its cultivation and development; but I do not think that we can yet apply it very confidently or extensively to the interpretation of morbid phenomena. This, upon the whole, it seems to me, is as far as we can go, safely and philosophically, in our attempts to explain and to account for the morbid processes and alterations, which constitute typhoid fever; or to establish, in other words, a theory of the disease.

CHAPTER X.

TREATMENT.

Perhaps there is no disease of equal frequency and importance, the treatment of which is so unsettled as that of typhoid fever; and there is, certainly, no disease, the therapeutics of which has, within the last few years, attracted so much attention, as of this. Various, and to some extent, opposite modes of management have been adopted, by different practitioners; they have been conducted on a large scale, for the most part in a fair and impartial spirit, and under circumstances favorable to the discovery of the truth; but they have not yet

resulted in the establishment of any uniform and satisfactory method of treatment. There is no unanimity in the opinions and conduct of different practitioners.

Under these circumstances, it is somewhat difficult to decide upon the best course to pursue, in treating of the subject, in a work like the present. It is impossible, within any reasonable limits, to describe, in detail, all the different plans of treatment that have been from time to time adopted, or that are still pursued; together with their actual or alleged results. Still the completeness of the work and the interests of humanity alike require, that the actual state of our science, in this respect; the sum and the result of our observations and researches, so far as these can be ascertained, should be fully and fairly stated. I shall therefore endeavor to do this, as far as it is possible. I shall describe the several modes of management, which have been most extensively followed, and most thoroughly studied, by those leading and distinguished men, who have been most favorably situated, for the investigation of this subject. In doing this I shall not often enter into any detailed and particular statement of the effects of individual remedies in single cases, or upon single symptoms, which different physicians allege that they have seen produced. It will be sufficient for my purposes to state, in general terms, the results of their investigations and analyses.

ARTICLE I.

DR. JACKSON'S METHOD OF TREATMENT.

Dr. Jackson, of Boston, after having been for many years an extensive, and careful observer of typhoid fever, both in public and in private practice, and after an accurate and circumstantial reexamination and analysis of the effects of remedies upon the disease, as they were exhibited in the wards of the Massachusetts General Hospital, arrives, finally, at the following conclusions, which it is impossible to give so weh, in any other way, as in his own words. They would suffer by any alteration or abridgment.

"First, that on the attack of this disease, the patient should immediately desist from labor and mental exertion, abstain from food, except of the simplest, liquid kind, and place himself in bed, or, at least, in a state of repose.

"Second, that free evacuations should be made at the beginning, and that in doing this, a day is important. It is better, that they be made the first day than the second, better on the second than the third; but that it is especially important that they should be made as early as the third day. That an emetic of tartarized antimony should first be given, and then an active cathartic, or the two in combination. If there is constipation at the time, an active enema, given at first to disembarrass the bowels, would no doubt facilitate the action of an

emetic. If the vomiting and purging are not followed by great relief, venesection should be practised on the following day, unless the constitution should be very feeble, or the case very mild.

"Third, if the disease has not subsided after the evacuations, tartarized antimony should be given every two hours in increasing doses, after the method of Odier of Geneva. Meanwhile the bowels should be kept open, and, for two or three of the first days, it would be well that calomel should enter into the medicine used for this purpose; not, however, giving more than one moderate dose in a day. It should be noted, however, that, usually, after the antimony has been given for forty-eight hours, this will act sufficiently on the bowels, and that sometimes it must be restrained by opium.

"Fourth, that, when the disease subsides early under any active treatment, it is quite essential that the patient should be restrained from solid food for two or three days, at least, after he has an appetite for it; and that he then use vegetable food in small quantities, for two or three days more. Likewise that he should not be allowed to make any efforts of either body or mind, until his convalescence is fully established. By this it is not intended that he should be confined wholly in bed, but that he should be confined to his chamber, and not allowed to talk on business, nor on any interesting subject.

"Fifth, that evacuations, vomiting and purging at least, may be resorted to with advantage in the second week; and that perhaps some benefit may

be obtained from antimony in small doses, when commenced in that week. But, that, after that period, no active treatment should be employed, or none which will cause any serious inconvenience to the patient.

"Sixth, as to diet. There is no point, probably, on which all practitioners are more agreed, than that food should be withheld from persons affected with the disease in its early period, except only the mildest, or most bland, liquid articles. Probably food would be injurious in its early period, at least, if it could be digested. But it cannot be digested perfectly, and often not at all, and that alone should forbid the use of it. When the disease is arrested or mitigated by treatment, it is very certain that an indulgence in the use of food is most commonly injurious, and that the cautions already stated are not too severe. When, however, the patient is fully reinstated, he must be allowed some extra food for the recovery of his flesh and strength. This must be done cautiously; but an extreme and protracted abstinence is injurious. When the disease runs its usual course, and the appetite for food returns, is there any danger in the indulgence of it? To this question I answer, in proportion as the return of appetite takes place early, more caution is necessary. If it takes place at, or about the end of the third week of the disease, if it is decided, and if it is accompanied by a cleaning of the tongue, almost any article, which the patient craves, may be allowed him with safety. The appetite is usually a

sufficient guide as to the quality of the food; but not as to quantity. In a large proportion of cases it will be found a most uncertain guide, as to quantity. Hence it is necessary to begin with small quantities, and to increase gradually. It is equally necessary to make the intervals long between the portions of solid food, which are given in the early period of convalescence. At first, there should be one portion of solid food in the day; the next day, if every thing is favorable, two portions, with five or six hours between them; and two or three days later, watching the effects, three meals may be allowed. But we are not merely to feel the pulse under these circumstances, to see if the fever has increased. The danger is not, I apprehend, that the system will be too suddenly nourished. It is that the enfeebled organs of digestion may not be able to digest the food. We must, therefore, watch all the signs, which refer to those organs. Only, if the head should ache, or other organs be disturbed, we should remember that the prominent signs of indigestion are often shown elsewhere than in the stomach, and stop the food till it appears whether this is not now the case. It is also to be constantly remembered, that constipation of the bowels will be followed by indigestion, and that evil must therefore be guarded against.

"Seventh, cordials. On this, as under the last head, I must give the convictions, arising from the most careful observations I have been able to make in many years. I cannot adopt the more accurate

mode of the numerical system. Nor in this case could this system be usefully followed, unless with the greatest attention to the state of each case. It has appeared to me that we should not adopt the rule to give cordials, nor to withhold them, in every case. When a patient is induced to take cordials, reluctantly, they seldom benefit him, and are often followed by injury. When he is greatly enfeebled, at a late stage of the disease, he may be safely asked if he wishes for them, and if he does, he may try them; they will seldom hurt him then, if he takes no more than is grateful to him. When he spontaneously demands them, as late as the third week, they will almost always be found useful. Now, in following these rules, I have occasionally found a patient, who would take a large quantity of some cordial liquor. But this has been rare. Few take them longer than two or three days, and the majority of patients do not take them at all. It is proper to add that by cordials I mean vinous liquors. I have most commonly found cider grateful in the first instance, beginning with an ounce, two or three times a day, and increasing according to the effects. Sound beer, or ale, is more rarely, but sometimes, grateful. In patients much exhausted, however, the strong foreign wines, Sherry, Port and Maderia, are found most useful. These articles may be diluted, or may be employed to season articles of diet, or may be given alone, according to the taste of the patient."[1]

[1] Dr. Jackson's Report on the Typhoid Fever. Med. Com. of the Mass. Med. Soc. vol. vi. part ii. p. 168, *et seq.*

It may be added here, that Dr. Jackson, during the early period of his practice, in common with most of the New England physicians, made use, also, of calomel in the treatment of typhoid fever. This article generally made a part of the purgative given at the commencement of the disease.

It was afterwards continued in small, and frequently repeated doses, combined, according to circumstances, with ipecacuanha, or antimony, or opium. Moderate ptyalism was looked upon as a favorable occurrence, although profuse salivation was dreaded. Dr. Jackson's faith in the usefulness of calomel was shaken a few years after the commencement of his practice; when the Massachusetts General Hospital was opened, he still resorted to it occasionally, during the first few days of the disease, and particularly when any secondary inflammation supervened; but confidence in the specific power of the medicine grew less and less, and since 1830, its use in the hospital has been nearly abandoned. Dr. Jackson informs me, that his convictions of the efficacy of *early evacuations* in the treatment of typhoid fever, founded on his experience in private practice, are not less strong than those which rest on the careful analysis which he has made of the results of his hospital cases.

ARTICLE II.

DR. NATHAN SMITH'S METHOD.

I shall now give a summary of the mode of management, followed in typhoid fever, by the late Nathan Smith. He begins his remarks on the treatment of this disease by saying, that he had never seen a single case in which he was satisfied that he had been able to cut short and arrest its progress; and that in all cases where the disease is going on regularly in its course, without any symptom denoting danger, and without any local distress, active interference will be likely to do more harm than good. Under such circumstances, he thinks no medicine should be given. He also expresses his conviction that all powerful remedies or measures, made use of in the early stage of the disease, are very liable to do harm, and that those patients who are treated with them in the beginning of the fever, do not hold out so well in its latter stages. He says that he has seen many cases, in which persons in the early stages of this disease were moping about, not very sick, but far from being well, and who, upon taking a dose of tartrate of antimony, have been immediately confined to their beds.[1] He adds, in another place, these remarks: "In cases of simple, mild typhus, where there is no nausea at the stomach, no pain

[1] Smith's Medical and Surgical Memoirs, p. 72, *et seq.*

in that region, where the heat is moderate, and the pulse not greatly altered in frequency, I am clearly of opinion that we had better leave the disease to cure itself, as remedies, especially powerful ones, are more likely to do harm than good. In such cases, the patient gets along better without medicine than with; all that is required is to give him simple, diluent drinks, a very small quantity of farinaceous food, and avoid, as much as possible, all causes of irritation."

Dr. Smith opposes the plan, then adopted by some New England practitioners, of general and almost indiscriminate bloodletting at the commencement of the disease. He would bleed only where there was "uncommon pain in the head, accompanied with great heat in that part, a sense of fulness, and a throbbing of the temporal arteries; or marks of congestion in the viscera of the thorax, such as pain in one or both sides of the chest, increased by a full inspiration." Under these circumstances, he thinks, that the loss of from twelve to sixteen ounces of blood will often mitigate the severity of the disease, and enable the patient to go through it with more safety. The immediate effects of bleeding have not appeared to him very obvious; and he says, that where the pulse is very frequent, the operation is seldom or never attended with any advantage.

Emetics are recommended by Dr. Smith only where there are nausea and oppression at the stomach, either at the commencement or during the pro-

gress of the disease. His favorite articles are ipecacuanha, eupatorium, or sulphate of zinc, given either singly or combined. Tartrate of antimony he looks upon as an inappropriate and unsafe remedy. The bowels, he says, should be kept open with gentle laxatives, but active and indiscriminate purging he considers hurtful. Blisters, according to his experience, sometimes relieve local pains, and are sometimes injurious. They may as well, he thinks, be generally dispensed with. Stimulating remedies given internally, with external heat, for the purpose of exciting active perspiration, have always appeared to him to be attended with bad consequences, at all periods of the disease. Opium, for the purpose of procuring rest and quietness during the night, when it is not contra-indicated by high febrile excitement and pain in the head, and in combination with ipecacuanha and camphor, to restrain immoderate diarrhœa, he says, may be used to advantage. He has seen, in many instances, very serious evils from the specific action of mercury, but no benefit. Cinchona he has found to produce a good effect in some cases where the surface was cold, and also where there was hemorrhage. The mineral and vegetable acids, the alkalis, refrigerants, as they are called, such as sulphate of magnesia, super-tartrate and nitrate of potass, he regards as unimportant or questionable remedies.

The most effectual refrigerant and febrifuge, in the hands of Dr. Smith, consisted in the free use of cold water externally. He is very warm and

decided in his commendation of this remedial measure. He says that there is nothing else so powerful in allaying morbid heat of the surface, in diminishing thirst, and in quieting restlessness and agitation. He directs the body of the patient to be uncovered, and then to be sprinkled or dashed repeatedly, with pure, cold water. He allows cold water for drink, as freely as the patient may desire, during the whole course of the disease.

Dr. Smith closes his account of his expectant and rational system of treatment in typhoid fever, with the following directions for the general care of the patient.

"When an individual is first taken sick with typhous fever, we should expect a disease of considerable length, and make our arrangements accordingly. If the thing is practicable, he should be kept in a spacious room, the larger the better. His bed should be of straw or husks, especially if it is in the warm season; and it should not be placed in the corner, but brought out into the room. We should contrive to have a current of air pass over the bed by means of doors and windows. * * * In the warm season of the year, the windows should be kept open night and day. All the furniture should be removed, except such articles as are required for the patient's use. The windows should be darkened, or something opposed to the light, in such a way as to still admit the air. The room should be kept as quiet as possible, since noise is injurious, and no more persons should be admitted

than are necessary to take care of the patient, which will, if he is very sick, require the labor of more than one.

The room should not be carpeted, and the floor should be often washed with pure water, or soap and water, and in the hot season, it, as well as the walls, may be kept wet with water during the heat of the day.

Cleanliness is absolutely essential to the patient's comfort, and no dirty dishes or useless medicines or food should be suffered to remain in the room. All excrementitious matter should be removed immediately. In the warm season of the year, the bed and body linen should be changed every day, and in the cold, every other day at farthest.

The patient's body and limbs should be cleansed every day with a piece of sponge and warm water, or soap and water. If a male, he should be shaved every day, or every alternate day, and if a female with long thick hair, it should be cut off or thinned, so as to leave but little of it the full length."[1]

ARTICLE III.

CHOMEL'S METHOD.

The treatment of typhoid fever, has been, especially for the last fifteen years, a subject of great interest amongst the physicians of the large hospi-

[1] Smith's Medical and Surgical Memoirs, p. 95, 96.

tals of Paris. It was in these institutions, that the symptomatology, diagnosis and pathology of the disease were first thoroughly studied; the opportunities which they offer for a careful trial and comparison of different modes of management are unequaled; and these opportunities have been very faithfully made use of by a considerable number of cautious, accurate and philosophical observers. Amongst them may be mentioned, particularly, and this without making any invidious distinction, Chomel and Louis. Chomel has been for many years attached either to La Charité or to the Hotel Dieu; he has grown old in the constant and conscientious study of disease; and, now, in the ripe maturity of age and experience, is unsurpassed in the capital of France as a man of practical sagacity and skill. I shall first give a summary of his practice in this disease.[1]

His treatment is, for the most part, what is called rational or symptomatic; that is, it is adapted, as far as common sense and experience enable us to do this, to the varying state and condition of the patient, in different forms of the disease, and in the several stages of its progress.

Simple and benign cases may be very safely trusted, he says, to refreshing drinks, such as lemonade, currant water, orange water, or pure water, taken at short intervals, and in such quantities as the patient may desire; emollient fomentations or

[1] Leçons de Clinique Médicale. Par A. F. Chomel, p. 449, *et seq.*

poultices upon the abdomen, when this is painful; sponging the surface of the body with vinegar and water, or cold affusions, if the skin is hot; mucilaginous injections, several times a day; cold applications to the head, when this is the seat of pain, and hot poultices or sinapisms, if there is a disposition to drowsiness and disturbed sleep. These measures, combined with fresh air, cleanliness and quiet, will generally conduct the patient safely through this form of the disease. Still Chomel is inclined to think, that even in these cases, a single moderate bleeding at the commencement of the fever, while it diminishes somewhat the severity of the headache, and shortens the period of its continuance, may also be of some utility in preventing the development of ulterior complications, and exert some favorable influence upon the march and termination of the disease. If the headache, or the pains in the abdomen are severe, leeches may be applied, below the mastoid processes, for the former, and near the anus for the latter. If the bowels are constipated they may be opened by some gentle laxative; if the diarrhœa is troublesome, it may be moderated by rice water, injections of starch and water, and so on.

In the inflammatory form of the disease Chomel adopts a more decided antiphlogistic course, adapted to the intensity of the symptoms, and to the age and vigor of the patient. The bleeding is to be repeated once or twice, leeches applied where they are indicated, and an entire abstinence, even from

liquid nourishment, enforced upon the patient. When the disease is marked by bilious symptoms, a yellow fur on the tongue, a bitter taste, nausea, vomiting of bile, and constipation, the same general course is to be pursued as in its simple form. Chomel has not often resorted, even under these circumstances, to the use of emetics, since he has generally found that the symptoms just enumerated have subsided under the simple, hygienic treatment. He thinks, however, that in some of these cases, where the disease comes on suddenly, and there is reason to suppose that the stomach may be oppressed by its contents, an early emetic would be useful. Chomel's mucous variety of typhoid fever is too indistinctly marked to make it necessary to notice the slight modifications of treatment, which he thinks it may require. In the ataxic form of the disease there are no uniform, rational indications. If it is attended with highly inflammatory symptoms, the active antiphlogistic course is to be pursued; if it is attended with great debility, tonics and cordials are to be given.

In the adynamic form of the disease Chomel adopts a decided tonic and stimulant treatment, adapted in activity to the degree of prostration and debility. He speaks with great confidence of the propriety and necessity of this course in these cases. Where the failure of muscular strength is extreme; indicated by the difficulty and languor of all the voluntary motions; the feebleness of the voice; the sinking of the features; the fetor of the breath;

sighing and faintness on assuming the sitting posture; smallness and weakness of the pulse; and coolness or coldness of the surface; it is necessary to administer, more or less freely, according to the number and gravity of these symptoms, tonics, aromatics and cordials. Amongst these the most important are cinchona, wine, camphor, and ether. Chomel prefers the cinchona, in the form of the extract, administered in an aromatic potion, to the amount of one or two ounces in the twenty-four hours. He also employs it in decoction or infusion, sweetened with lemon syrup. He doubts whether the sulphate of quinine is of equal efficacy as a tonic; so that notwithstanding the inconveniences frequently attending the administration of the extract, especially in large quantities, he still prefers it to the former. At the same time that the cinchona is employed in this manner, he uses it, either in decoction, or in extract, in the form of enemata.

While the adynamic phenomena already enumerated are only moderate in degree, and before the necessity for the free use of cinchona has yet appeared, the lighter wines, such as those of Bordeaux and Burgundy, may be given: when these phenomena are more strongly marked, the stronger wines, such as Madeira, Sherry and Port, must be resorted to. These may be given to the patient in his drinks; or, as is best in the more grave cases, undiluted. The quantity to be administered must depend, of course, upon the urgency of the symptoms calling for its use. A table spoon full of one of the strong

wines may be given at intervals of from one to three or four hours. The effects of these remedies must be carefully watched; and if they produce febrile heat and restlessness, pain in the head, or any other obvious local disturbance, their use must be suspended or modified. It will not often be either necessary or safe to resort to them in the early periods of the disease; although such will sometimes be the case. It is commonly during the second or third week, or even later, that this tonic and stimulant medication is called for; and it is often a nice point in the therapeutics of typhoid fever to seize upon the exact period when it is required and will be borne. Ether is to be used when there is an urgent necessity for rapid and immediate stimulation; Chomel also occasionally combines it with the mixture of the extract of cinchona. Camphor he rarely uses, except as an ingredient in the tonic injections. In extreme cases, where there is a combination of the ataxic and adynamic elements, he recommends the use of musk, in large doses, by the mouth and by injection.[1] He speaks more decidedly of the evils attending the application of blisters, than of any benefits to be derived from them.

The epistaxis will not often require any special attention. If it is at all copious the application of a cold, astringent solution will generally be sufficient to arrest it. Sometimes, however, it is ne-

[1] Gazette Médicale de Paris, March, 1835.

cessary to resort to mechanical compression by plugging up the nostrils. To control the hemorrhage from the bowels, Chomel recommends iced water for drink, in injections, and applied upon the abdomen; lemonade, and the extract of rhatany. The formation of ulcers should be guarded against by avoiding constant pressure upon those points where they are most liable to occur; and when once formed they should be protected from irritation, and properly dressed. Local inflammations, occurring in the early periods of the disease, or when the debility and prostration are not strongly marked, are to be met by local and general bleeding, adapted to the circumstances of the case. If the patient is in a condition not likely to tolerate these measures, dry cupping and sinapisms in the neighborhood of the inflammation, which is most commonly a pneumonia, may be substituted. When these complications take place, during the adynamic period, or in the adynamic form of the disease, they do not contra-indicate the use of stimulants and tonics. The local inflammation, under these circumstances, will be more surely relieved, or enabled to relieve itself, by a removal of the extreme general debility, through the agency of a tonic medication, than by the abstraction of blood. Perforation of the intestine is to be treated after the manner of Drs. Graves and Stokes of Dublin; by entire abstinence from drinks and food; absolute rest; and large and repeated doses of opium. In the management of the patient, during convalescence, Chomel urges

the importance of a mild diet and the avoidance of fatigue; and in cases where there seems to be some obstacle to the entire reëstablishment of health, he recommends a removal from the city to the country.

In 1831, at the suggestion of a young physician, who attended his clinical lectures at the Hotel Dieu, Chomel commenced the trial of chloride of soda in the treatment of typhoid fever. He did not change, in any other respect, his system of management, but superadded the use of this remedy to the rational plan of treatment, which has just been described. He administered the chloride in a sweetened solution of gum Arabic, containing from one grain to one grain and a half to the ounce. Of this solution his patients generally took from fifty to ninety ounces in the twenty-four hours. Injections of the same solution were given morning and night; the body of the patient was freely washed, several times a day, with a solution of the chloride in water; poultices moistened with it were applied to the abdomen; the bed clothing was sprinkled with it; and vessels containing it were placed under the bed. In order to test, as nearly as possible, the value of this specific medication, it was mostly confined to well defined cases, at least of sufficient severity to be attended with some danger; and in which it could be applied at the beginning or early in the disease. The results of this plan, in the hands of Chomel, from 1831 to 1834, the year in which his work on typhoid fever was published, were various and not very decisive. In that work,

however, he expresses himself, at the close of his remarks upon this subject, in the following terms: "Finally, although the results of this treatment have been very different in different years, it has still been attended with more success than any other. Several distinguished practitioners have informed us, that they have arrived at the same conclusion. We shall continue, then, our trials with a mode of treatment, which, combined with the rational method, has thus far given us, notwithstanding its failures, more satisfactory results than any other." Subsequent to this, however, in 1835, with a frankness, a conscientiousness, a single-minded regard for the truth, which it is beautiful to witness, he says, "The hopes, which our first trials with the chloride had permitted us to conceive, have not been realized. The results, which have thus far been obtained, are not sufficiently encouraging to justify us in the expectation of continuing our trials with much chance of success." [1]

ARTICLE IV.

LOUIS'S METHOD.

Louis, in the second edition of his Researches on Typhoid Fever, in 1841, seems somewhat undecided in his opinion upon the therapeutics of the disease.[2] He hesitates between the rational method, which he had generally followed, and the purgative plan

[1] La Lancette Française. August, 1835.

[2] Louis on Typhoid Fever, vol. ii. p. 379, *et seq.* 2d ed.

adopted by De Larroque. Putting the latter out of consideration, for the present, Louis, after a very careful and thorough examination and analysis of the effects of remedies, finally fixed upon the following general plan of treatment, as the best that could be pursued in the present state of our knowledge upon this subject.

Early in the disease, and at any rate within the first ten or twelve days, he resorts to general bloodletting, its extent and repetition to be proportionate to the strength and vigor of the patient, and the severity of the disease. If the case is mild, or of moderate severity, and the constitution of the patient not very robust, a single bleeding of twelve ounces will be sufficient; in other cases of greater severity, and where the constitution is sound and vigorous, the bleeding should be somewhat more copious, and repeated once or twice. Louis is satisfied, that this remedy, within these limits, is generally useful in shortening, to the extent of a few days, the average duration; in diminishing the gravity, and of course in lessening somewhat the mortality of the disease. After the fifteenth day, in severe cases, and at an earlier period in mild ones, where there is but moderate febrile excitement, bloodletting should not be practised. Under these circumstances the operation does no good, and retards instead of hastening the period of convalescence. Louis has not found the immediate effects of bloodletting, either upon the general severity of the disease, or upon any of the single symptoms, to

be very marked or obvious. In some cases the operation is followed, either at once, or in the course of twenty-four hours, by an amelioration of one or more of the most urgent symptoms; in some cases, on the other hand, it is followed by their aggravation; and furthermore, these changes in the severity of the symptoms are such as frequently occur where bloodletting has not been resorted to, and where, indeed, no active medication has been used.

This measure is to be aided by suitable drinks, emollient enemata, and cool, fresh air. The drinks should consist of sweetened gum water, or of this in combination with artificial Seltzer water, in order to obtain the effects of the carbonic acid gas. They should be given in large quantities, as freely as the patient may desire. Mucilaginous enemata are to be given once a day, during the early period of the disease; and, subsequently, when the diarrhœa is troublesome, two or three times a day. If, notwithstanding their use, the discharges from the bowels continue to be frequent, and debilitating, a small injection, containing a few drops of laudanum, should be substituted.

Tonics are considered by Louis not only very useful but very necessary, under certain circumstances. When the general febrile excitement has subsided; when the prostration of strength is extreme; when the pulse is only moderately accelerated, or not at all; when there is slight diarrhœa and little or no tympanites; they should be at once and freely resorted to. Louis prefers the sulphate

of quinine to any other article, given in an aromatic or mucilaginous draught, in doses of from eight to twenty grains. He gives the patient, at the same time, a sweetened infusion of cinchona for drink; and, if there is diarrhœa, he makes use of tonic and astringent injections.

Louis dismisses blisters from his plan of treatment with strong and unqualified condemnation. He says there is no evidence that they are of any benefit, and that, not unfrequently, they add to the gravity, the inconveniences and danger of the disease. For the last ten or twelve years he has abandoned them entirely. He recommends opium, after the method of Graves and Stokes, in cases of perforation of the intestine, though in smaller doses. He reports a case, probably of this accident, which occurred at the Hotel Dieu in 1840, and which was cured by this method. Opium, he thinks, is also of use in allaying some of the nervous symptoms; such as twitching of the tendons and slight delirium, when the febrile excitement is not very high. When the delirium is violent he has seen little or no benefit from the use of leeches or the application of ice to the head; but he recommends, in this case, if the face is flushed, even if the disease has reached its twelfth or fifteenth day, and even if the patient has already been twice bled, another moderate bleeding. When the meteorism is extreme, he thinks it may sometimes be diminished by the administration of enemata, consisting of magnesia in an infusion of flaxseed. In grave cases the con-

dition of the bladder should be carefully watched from day to day, and retention of urine guarded against. It is unnecessary to repeat his observations upon the importance of rest, cleanliness and free ventilation, during the progress of the disease, and of light diet and the avoidance of fatigue, during convalescence.

In concluding this subject, Louis makes use of the following words: "It results from all that precedes, upon the effects of the principal therapeutic agents at present employed in the treatment of typhoid fever, that these agents possess a favorable though limited influence upon the march and termination of the disease; and that an impartial examination of facts points out, with a good degree of precision, the best method of employing the three principal means, which experience has placed in our hands; to wit, bloodletting, evacuants, and tonics. Furthermore, the limited degree of success, which has thus far been obtained, ought not to discourage the friends of science, nor prevent them from hoping, that a more appropriate and successful treatment of this disease will yet be discovered. Who could have foreseen the effects of opium, of cinchona, or the preservative power of the vaccine virus? What accident and observation have hitherto done they are still able to do, without doubt they still will do; and therapeutics, like the other parts of science, ought to hope and to expect every thing from observation."

ARTICLE V.

BOUILLAUD'S METHOD.

Some ten or twelve years ago Bouillaud introduced a mode of practice, in the treatment of all acute diseases, and amongst them of typhoid fever, which he claims to be of his own discovery, and which he claims also to have been attended with extraordinary success. This mode consists in copious and frequently repeated abstractions of blood, and in the application of leeches or of scarified cups in the intervals.[1] The number of his bleedings varies from one to five or six, of from twelve to sixteen ounces each; and nearly or quite an equal quantity of blood is taken from the patient by means of leeches or cups. This lavish waste of the vital fluid is not confined to the earliest period of the disease, since many of the patients, who are subjected to it, are not received into the hospital until the second week of the fever. The average day, indeed, is as late as from the ninth to the twelfth. This method he calls that of bleeding *coup sur coup*, blow upon blow, or dash upon dash, or again and again. He claims to have reduced the practice of bloodletting, in acute diseases, to an established *formula*. In connection with this subject he also announces, in loud and confident tones, that *success, or cure is the law, failure, or death the exception*. He claims for

[1] Essai sur la Philosophie Médicale, etc. Par J. Bouillaud. p. 412. *et seq.* Bruxelles, 1836.

his new method an almost infinite degree of superiority over those generally in use; and that the actual, average mortality, under it, is less than half as great as under the old and generally adopted plans.

The bold and arrogant terms in which these high pretensions were put forth, the offensive freedom of Bouillaud's remarks upon the practice of his contemporaries, to say nothing of the importance of the subject, and the interests of humanity and science, soon led to a thorough examination, and a discussion, generally warm and sometimes intemperate, of his claims. It is not my intention to enter into a history of these proceedings. It is quite sufficient for my purpose to say, that his statistical tables were *rectified*, his mistaken diagnoses were corrected, and the positive results of his practice shown to be in no degree more favorable than those of other physicians; probably less so. It ought to be said, however, before dismissing the subject, that if Bouillaud has failed to establish the superiority of free and repeated bleeding in the treatment of typhoid fever; he seems, at least, to have shown, that the practice is borne in this disease, with a greater degree of impunity, and is attended with less danger, than had generally been supposed possible.

ARTICLE VI.

DE LARROQUE'S METHOD.

There is still another exclusive mode of treatment, very unlike that of Bouillaud, which has been

pretty extensively followed, within the last six or eight years, in the hospitals of Paris. I mean that by evacuants, and principally by purgatives. The fifteen or twenty years' reign of the Broussaisian doctrine of fevers, in Paris, had almost entirely banished emetics and purgatives from the treatment of these diseases. Their use was formally and absolutely proscribed. It was murderous and incendiary to give either one or the other. After this medico-doctrinal dynasty had had its day and gone by, therapeutics became gradually more eclectic and less exclusive. Different modes of practice were adopted by different physicians, in the same disease; and it could hardly fail to be discovered, that the fears which had so universally prevailed, founded upon theoretical considerations, of the injurious effects of purgatives, were either without foundation, or very much exaggerated. Lerminier, of Paris, and Bretonneau, of Tours, had occasionally made use of purgatives in the treatment of typhoid fever; but M. De Larroque, a physician of the Necker Hospital, was the first to adopt the evacuant, or emetico-cathartic plan, as a general and almost exclusive mode of treatment in this disease. He commenced his trial of this method in 1831, since which time it has been more or less extensively followed by Piedagnel at the Hotel Dieu, Andral, at La Charité, Louis, at La Pitié, and by others. The plan adopted by De Larroque is the following: He usually commences his treatment by the administration of an active antimonial

emetic; and this is to be repeated until free vomiting is procured. The operation of the emetic is to be immediately followed by the use of purgatives, without much regard to the state of the bowels, the condition of the patient, or the period of the disease; and these are to be continued regularly up to the time of convalescence. His principal articles are Seidlitz water, castor oil, and calomel. To these remedies he adds emollient poultices to the abdomen, when there is pain in this region; mucilaginous injections, morning and night; acidulated drinks; and when the febrile excitement subsides, light tonics. Louis, in the second edition of his Researches, expresses himself pretty strongly in favor of the purgative treatment. He himself made use mostly of Seidlitz water, and he thinks that his success with this method was greater than with his former practice.

ARTICLE VII.

MISCELLANEOUS.

In addition to the accounts which have been given of the foregoing systematic methods of treatment, it may be well to mention, in conclusion, some few individual remedies, and their application, which have been recommended by different practitioners. M. Barthez and M. Fouquier, amongst the French, and Drs. Dobler and Skoda amongst the Germans, have made use of alum; supposing that it might act directly in retarding the progress

and in diminishing the severity of the intestinal lesion. I am not aware that there is yet any satisfactory proof of its utility. Dr. Gerhard thinks, that in mild cases gentle purgatives, such as a few grains of blue pill, followed by castor oil or Seidlitz powder, should always be given at first, for two or three days; and that whenever constipation is present the repetition of the laxative is useful. If the dizziness and headache are troublesome, he says that they may be removed or greatly relieved by cupping, by a mustard pediluvium, or by a blister to the nucha. From the latter application, when properly timed, that is, after the active febrile excitement has subsided, Dr. Gerhard has never known any injury to result, and he has generally found it to mitigate the severity of moderate cerebral symptoms. In both severe and mild cases, towards the decline of the disease; that is, about the end of the second week if it be severe, and a little earlier if it be mild, he makes use of small doses of calomel or of blue pill, combined with ipecacuanha, and with a minute quantity of opium if the diarrhœa is troublesome. One or two discharges from the bowels, daily, he thinks are of service in all stages of the disease.[1]

I have already spoken of the unsettled and discordant state of the professional mind in regard to the therapeutics of typhoid fever. It would be no difficult matter to multiply and strengthen the

[1] Medical Examiner, vol. iv. p. 150, 151.

proofs of this truth, already sufficiently shown by the foregoing details. This, however, would be but an unprofitable labor; in the present state of our knowledge, of no practical value. Under the circumstances in which we are placed, amidst the claims and pretensions of conflicting opinions, it seems to me, that we are not now justified in the use of any ultra or exclusive system of treatment; like that, for instance, of Bouillaud or De Larroque. For the present, our management of the disease must be eclectic and rational, not exclusive and specific. In its early stages, unless in cases where there may be special contra-indications, it seems to be generally conceded, that a moderate antiphlogistic course is the best that can be adopted; and that active emetico-cathartics, if used at all, ought to be used at this same early period. In the subsequent progress of the disease, a mild, alterative and rational plan, keeping the bowels moderately loose by laxatives, when this is necessary, and meeting particular symptoms with such remedies as experience has shown to be most suitable, would appear to be most appropriate and successful. After the first few days, in cases of moderate or average severity, with no special or urgent indication, it is quite clear, I think, that all treatment, in any way decidedly active or perturbating, is to be avoided. The tendency of the disease, in all such cases, is towards a natural termination in health; and there is no evidence, that the dangerous complications, which are liable to occur, can be prevented by any

active interference. I may remark, in this connexion, notwithstanding what has been said, that carelessness, or indifference, in the management of the disease, growing out of the unsettled state of opinion in relation to its treatment, and of the limited control, which we possess over it, would be as criminal a dereliction of duty, as it would be unbecoming in a cultivator of the science, and a practitioner of the art of medicine.

We may hope, that our treatment of this disease will yet become more successful, and more uniform; more exact in its application, and more positive in its results. Many "ministers and interpreters of nature," faithful to their high vocation, and competent to its duties, are zealously and patiently occupied in endeavoring to accomplish this end. Guided by a sound philosophy; relying upon the one great means of ascertaining the properties and relations of all forms of matter, inorganic and organic, that of observation, they or their successors may yet find, by persevering experiment, or fortunate discovery, methods of modifying the living organization, and of correcting its disordered actions, which shall give us a much greater control over the disease, than we are now able to exert.

CHAPTER XI.

DEFINITION OF TYPHOID FEVER.

We may, provisionally at least, adopt the following definition of the disease, the natural history of which has now been given.

Typhoid fever is an acute affection; occurring, most frequently, between the ages of fifteen and thirty years, sufficiently often previous to the former period, and but very rarely after the fortieth year of life; attacking, at least in cities and amongst adults, in a large majority of instances, persons who are recent residents; occasionally, and under certain conditions, the nature of which is unknown, capable of transmission from one individual to another; rarely occurring twice in the same person; more common in certain countries, than in others, but not confined, so far as is known, to any geographical localities or regions; prevailing at all seasons of the year, and in all climates; sometimes sudden and sometimes gradual in its access; attended, at its commencement, with chills or rigors, not commonly very severe, and usually repeated, at uncertain intervals, for the first few days; then, with more or less feverish heat of the skin; generally, with increased quickness of the pulse; somewhat accelerated respiration; slight, dry cough; an extensive sonorous or sibilant rhon-

chus; with pain in the head, back and limbs; loss of the vigor, and in grave cases, perversion of the faculties of the mind; dull expression of the countenance; more or less somnolence or watchfulness; giddiness or dizziness; ringing, roaring or buzzing in the ears; occasional epistaxis; great loss of muscular strength; in grave cases, with spasmodic twitchings of the muscles, especially those of the fore arms and hands; with entire loss of appetite and with thirst; sometimes with nearly a natural appearance of the tongue, and at others, with a red, dark, dry, glutinous, cracked, trembling state of this organ; sordes upon the teeth and gums; occasional nausea and vomiting; frequent diarrhœa; abdominal pains and tenderness; these latter not unfrequently most marked in the right iliac region; dullness on percussion over the spleen; meteoric distention or rigidity of the abdomen; the skin, particularly of the front part of the body, being usually the seat, in the course of the second and third weeks of the disease, of a peculiar eruption, not commonly abundant, consisting of small, circular or oval spots, of a bright rose color, slightly elevated above the surrounding surface, and readily disappearing under pressure; the blood, when drawn from the body, having its proportion of fibrine diminished in a degree closely corresponding to the gravity of the affection: — which symptoms differ, very widely, in their duration, in their march, in their severity, and in their combinations, in different cases; no one of which is invariably met with,

and several of which are frequently wanting; but enough of which are almost always present to characterize the disease: — which symptoms, furthermore, may either gradually diminish in severity, and finally disappear, between the twelfth and the thirtieth day of the disease; or may increase in severity, and terminate in death, between the seventh and the fortieth day from their access: — the bodies of patients exhibiting, on examination after death, in only a certain proportion of cases, various pathological changes in the brain, heart, lungs, stomach, and liver; but, in most cases, enlargement, or softening, or both, of the spleen; and, in all cases, thickening, or redness, or a morbid transformation, or ulceration, or all these changes, of the elliptical plates of the ileum; with enlargement, redness and softening of the mesenteric glands, corresponding, in their position, to the altered intestinal follicles: — which disease, thus characterized and defined, differs essentially from all others, in its causes, in its symptoms, in its lesions; and is, in the present state of our knowledge, only to a limited extent under the influence or control of art.

PART SECOND.

THE

HISTORY, DIAGNOSIS, AND TREATMENT

OF

TYPHUS FEVER.

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PART SECOND.

TYPHUS FEVER.

CHAPTER I.

PRELIMINARY MATTERS.

I NOW proceed to the description of typhus fever. The natural history, which I shall be able to give of this disease, will be somewhat less complete than that which I have already given of typhoid fever. The reason of this is twofold: in the first place, I have seen much less of the disease, myself; and in the second place, no entire and elaborate histories of the disease have ever been published. We have many excellent general descriptions of it, especially as it has shown itself in certain localities, and during certain epidemic periods; but we have had no thorough and detailed histories of its symptomatology and lesions; like those which Louis, Chomel and others have furnished us of typhoid fever. To these remarks it may be added, that the diagnosis of typhus fever, by most of the observers upon whose records we must depend for our materials, is

much less accurate and positive, than that of typhoid fever is, as this disease shows itself in New England and in France. Typhus fever is more frequently confounded and mixed up with other diseases, by its best historians, than typhoid fever is; and in this way another element of incompleteness and confusion is introduced into its history.

The materials for the following description will be derived mostly from British physicians, especially those of Ireland and Scotland; and from Dr. Gerhard of Philadelphia. The accounts of typhus fever, which have been published, from time to time, and mostly in the form of Hospital Reports, by the Scotch and Irish practitioners, constitute our richest and most authentic sources of information in the study of this disease. This remark is especially applicable to the Hospital Reports of Dublin, made subsequent to the year 1812; by Edward Percival, John O'Brien, F. Baker, William Pickels, John Cheyne and others. I know nothing of a like character in the English language superior to the Hospital Reports of John Cheyne; and the most valuable history of the disease now under consideration, which has ever been published, is to be found in the account given by Dr. Barker and Dr. Cheyne of the great epidemic of typhus fever, which overran Ireland during the years 1817, 1818, and 1819. One reason for this reliance, which I am disposed to place upon the observations of Irish and Scotch writers rests upon the belief, the grounds of which will be fully stated hereafter, that true typhus

fever is more exclusively the prevailing fever in Ireland and in the northern portions of the British empire than in the middle and southern regions of England. Dr. Gerhard has published in the American Journal of Medical Sciences, a very valuable history of an epidemic typhus fever, which prevailed in Philadelphia, during the spring and summer of 1836; and which was carefully studied by himself and Dr. Pennock. I am aware of the danger of trusting to the phenomena presented by any single epidemic, in making up the history of a disease, and I do not intend, in the present instance, to be guilty of this fault. I look upon the papers, published by Dr. Gerhard, as of inestimable value; but it is only by a careful examination of many histories of typhus fever, and by a methodical arrangement of the materials which they may furnish, that I can hope to make out even a tolerably complete and satisfactory description of the disease.

I shall follow, as far as this can conveniently be done, the same general plan in the disposition of the several subjects of inquiry and description, as has already been adopted in the foregoing history of typhoid fever: and as one leading object of the present work is to point out the resemblances and the differences between the two fevers, which constitute its subject, instead of leaving these resemblances and these differences entirely for formal and special consideration, near the close of the volume, I shall speak of them, successively, under their appropriate heads, as I go along.

CHAPTER II.

SYMPTOMS.

ARTICLE I.

MODE OF ACCESS.

Typhus fever is sometimes sudden and sometimes gradual in its access. I am unable to state, with any degree of certainty, the proportion between these classes of cases. In a large majority, however, the formal accession of the fever seems to be preceded by several days of vaguely defined ill health, as is the case, also, with typhoid fever. In six or eight cases, reported by Dr. Gerhard, the patients complained, for a period of from three to seven or eight days, of various uncomfortable feelings; such as languor, loss of appetite, soreness of the muscles, sleeplessness, wandering pains in different parts of the body, and so on. In the other two cases, the disease came on suddenly. Dr. O'Brien says, that these premonitory symptoms continue generally for a few days, but sometimes for a week or two. Amongst these symptoms he enumerates lassitude and fatigue on the least exertion; dullness of the eyes; sallowness and dejected expression of the face; heavy, dull pain in the head; slight nausea; anxiety without any apparent cause; slight chills, frequently repeated, especially towards night, and

imperfect, disturbed sleep.[1] Dr. Pickels speaks of the disease as being nearly always preceded by trembling and nausea.[2] Dr. John Cheyne, in his description of the fever of the spring and summer of 1818, as it showed itself at the Hardwicke Hospital, Dublin, says: "Some patients felt an unaccountable dejection of spirits for several days before seizure; some continued at work or labor for several days after their illness began in the shape of a headache, which frequently intermitted; in a few the disease began with intense headache without rigor; the patients being, as they said, at once knocked down."[3]

Many writers, who have seen much of the disease, mention cases, in which persons in full health, while standing by the bed of the sick, and breathing the infected atmosphere from the body and bed of the patient, have been instantaneously seized with nausea, giddiness, faintness, and so on, and these symptoms have been immediately followed by the gravest form of the fever.

ARTICLE II.

FEBRILE SYMPTOMS.

I do not know that there is any thing peculiar or characteristic in the initiatory chill of typhus. Many writers speak of it very indefinitely or not at all. Sometimes it is of some severity and well-

[1] Trans. of Phys. of Ireland, vol. i. p. 410. [2] Ibid. vol. iii. p. 196.
[3] Dub. Hos. Rep. vol. ii. p. 4.

marked, but in many cases it seems to consist merely of a sense of chilliness, felt over the whole body, or especially, perhaps, along the back, and continuing not unfrequently, for two or three days.

After the disease is fully formed, the surface of the body becomes preternaturally hot. The heat of the skin is peculiar and pungent, constituting what has been called "calor mordicans." Dr. Gerhard says, that this burning heat of the skin was so remarkable, in the Philadelphia epidemic of 1836, that the resident physicians and others would frequently diagnosticate the disease from this symptom alone. This morbid heat is generally accompanied by dryness of the skin. It is increased towards night, forming a well marked evening exacerbation. Dr. Edward Percival observes, that the strongly marked exacerbation occurs more frequently in the first than in the second or third week of fever. During the spring and summer of 1817, the temperature of the surface on the day of admission to the Hardwicke Fever Hospital, Dublin, was ascertained by the thermometer, in two hundred and fifty cases. It ranged from 97 to 100 deg. Fah. inclusive, in eighty-three cases; from 101 to 106 deg. Fah. inclusive, in one hundred and sixty-three cases; and from 107 to 109 deg. Fah. inclusive, in four cases.[1] During the winter and spring of 1818, a similar examination was made of ninety-nine cases, with similar results. The temperature ranged

[1] Dub. Hos. Rep vol. ii. p. 10.

from 95 to 100 deg. Fah. inclusive, in twelve cases; and from 101 to 106 deg. Fah. inclusive, in seventy cases; and from 107 to 109 deg. Fah., in seventeen cases. Towards the termination of the disease the skin not only loses this acrid and burning heat, but frequently becomes cooler than natural.

Most writers upon this disease speak of the odor from the body of the patient. Southwood Smith calls it peculiar and characteristic, but does not attempt to describe it. John Cheyne mentions the offensive fetor from the patient. Dr. Gerhard is more explicit upon this point. He says, that this peculiar odor was pungent, ammoniacal and offensive; especially in severe cases, and in fat, plethoric individuals; sometimes, for a few days before death, the smell resembled that of putrid animal matter. The bodies of these patients ran into decomposition very rapidly after death, although, before putrefaction, the odor was less pungent than it was during life. Dr. Pickels says, that upon entering the room of a patient, the presence of typhus fever was indicated, previous to any examination, by this peculiar fetor from the skin. Dr. Doane informs me, that many of the emigrant patients with typhus fever at the New York quarantine hospital, give out an odor, which he describes as sour, dirty, and offensive.

The pulse is generally very frequent. In severe and fatal cases it is often more than 120 in the minute, and not unusually as high as 150. Of two hundred and thirty-seven cases, in the Hardwicke

Fever Hospital, the average frequency of the pulse, on the day of admission, was from 52 to 78, inclusive, in twenty-seven; from 80 to 100, inclusive, in seventy-nine; from 102 to 120, inclusive, in ninety-five; and from 124 to 180, inclusive, in thirty-six.[1] The rapidity of the circulation was, generally, but not uniformly, proportionate to the excess of temperature. Sometimes, though rarely, the frequency of the pulse, even in very grave cases, is below the natural standard. It is nearly always regular. Dr. Gerhard says, that the peculiar undulation in the motion of the artery, so frequent in typhoid fever, was rarely felt in the Philadelphia typhus of 1836.

Other characteristics of the pulse are not very easily and accurately defined. It is safe, however, to say, that the pulse very rarely, if ever, exhibits the strength, hardness and sharpness of inflammatory diseases. Sometimes, early in the fever, it may be somewhat full, but even then, it is easily compressed; and after the first few days it is almost always small, soft and feeble.

In this connexion, better than any where else, I may speak of the feeble action of the heart. This feebleness in the contraction of the central organ of the circulation is particularly mentioned by Dr. Stokes of Dublin, and other writers on typhus fever. Dr. Gerhard found it extreme in many cases, even from the earliest period of the disease.

[1] Dub. Hosp. Rep. vol. ii. p 4.

ARTICLE III.

THORACIC SYMPTOMS.

In most cases of typhus there is some lesion of the respiratory organs manifesting itself by signs or symptoms during life. I do not find that any special attention has been paid to the acceleration of the breathing. Dr. Gerhard found, early in the disease, a feeble and imperfect respiratory murmur over the posterior portion of the chest, with corresponding dullness on percussion. These signs were frequently, but not always, combined with a subcrepitant or mucous rhonchus. This latter was more common during the cold than during the warm weather. The sibilant rhonchus, common in typhoid fever, was rare in this epidemic. Pneumonia constituted the most frequent accidental complication, especially in the winter. It was indicated by a loose mucous rhonchus, instead of the fine, dry crepitus, and bronchial respiration of simple pneumonia, and was unattended by pain.

Dr. Pickels says, that in the typhus fever of 1817, 1818, and 1819, in Cork, next to the affection of the head, the most prominent and constant feature was the affection of the chest; as marked, during the first days, by oppression of the precordia, sighing, and, in the course of the disease, by cough. The cough was generally accompanied by a copious and viscid expectoration, and was especially

urgent, early in the disease, during the winter months.[1]

The frequency of respiration, during the active period of the disease, is increased. Of one hundred and seventy-one cases, admitted into the Hardwicke Fever Hospital, during the spring and summer of 1817, the average frequency of the respiration, on the day of admission, was about 30 in the minute. It ranged from 20 to 30, inclusive, in eighty-four cases; from 32 to 40, inclusive, in seventy-seven cases; and from 44 to 60, inclusive, in ten cases.[2]

Of two hundred patients treated by Dr. Henderson at the Edinburgh Royal Infirmary in 1838, and 1839, there were symptoms of thoracic disease in seventy-three. In a large majority of these cases the symptoms were bronchitic.[3]

ARTICLE IV.

CEREBRO-SPINAL SYMPTOMS.

Amongst the most constant and prominent symptoms of typhus fever are those connected with the nervous apparatus. They obtrude themselves urgently upon our observation; they are striking and strongly marked in their character; they are many in number; they are present at the earliest period of the disease; and they accompany its various stages

[1] Trans. of Phys. of Ireland, vol. iii. p. 198.
[2] Dub. Hosp. Rep. vol. ii. p. 11.
[3] Edin. Med. and Surg. Journal, Oct. 1839.

up to the time of convalescence. Notwithstanding all this; for the very reason, perhaps, that it is so, I am unable to give anything like so full and discriminating a history of this extensive and important class of symptoms, as I have given of the corresponding symptoms in typhoid fever. The British writers upon typhus fever do not seem to have considered it at all necessary to speak with any considerable degree of particularity of these symptoms; so that it is impossible, in the actual state of our knowledge, to make so satisfactory a comparison, in this respect, between typhus and other fevers, as is desirable.

Sec. I. — *Headache; pains in the Back and Limbs.* Pain in the head is almost always present during the early period of typhus fever. Dr. Gerhard does not speak of it in his general description, but it is mentioned in all his reported cases, eight in number. It is very commonly amongst the premonitory symptoms of the disease; and if not present at this time, is very sure to constitute one of the signs of its formal and more decided attack. Dr. Henderson found it in one hundred and fifty of one hundred and fifty-nine cases; it was present on the first day in ninety-two of one hundred and eight cases; and its mean duration was ten days.[1] Dr. Pickels says of the Cork epidemic, in 1817, 1818, and 1819, "the most distressing source of

[1] Edin. Med. and Surg. Jour. vol. lii. p. 432.

uneasiness was the headache, the patient, when questioned, complaining, in almost every instance, particularly of this pain; and often using some comparison illustrative of its acuteness. It was commonly referred to the forehead, more particularly over the eyes; rarely to the occiput. In a few instances it was dull and vertiginous." The headache is usually accompanied by pains, more or less constant and severe, in the back, and in the extremities, particularly the legs. Dr. Stewart informs us, that of one hundred and thirty-nine cases, occurring at Glasgow, the headache was present, after the fifth day, in ninety-eight; that in between one-sixth and one-seventh of this number it ceased before the tenth day; but that in the remaining five-sixths it continued throughout the advanced stages of the disease, and in eleven throughout the whole course of the affection.[1]

Sec. II. — *State of the Mind.* The mind is almost always more or less affected from the commencement of the disease. This affection may consist, for the first few days, merely in a diminution of its usual strength and activity. The patient feels himself confused, and cloudy, and hesitating in his thoughts. His accustomed aptitude for intellectual effort is lost. Dr. Gerhard says, that in the Philadelphia epidemic of 1836, "the alteration of the intelligence was so slight at first as to escape

[1] Edinburgh Med. and Surg. Journal, Oct. 1840.

the attention of an inexperienced observer; but when the fever had fully set in, there was at least confusion of the intellect, and nearly always delirium. This last symptom was absent in only a few cases. The delirium was not noisy, except in about one patient out of twenty. In the immense majority of patients, it was dull, muttering and incoherent. The delirium became more tranquil, and was exchanged for ordinary stupor or coma, when the fever was at its height. It did not cease entirely until the complete establishment of convalescence. Even after recovery the intellect of the patient was more enfeebled than it is in ordinary diseases, and regained its usual strength but slowly."

In the Irish epidemic at Cork, already spoken of, Dr. Pickels says, "the patient commonly raved of those objects, which had principally engrossed his attention during health. A cow-herd, who had been brought in from the country, fancying that the patients who lay around him, were those animals which he had been accustomed to attend, endeavored at intervals to rouse them into motion by a particular cry, which is usual for this purpose, in the country. A thief raved of his thefts and accomplices. A faithful steward refused, with many acknowledgments, to take his wine, as he had his master's keys, and it might render him unfit to perform his business." Dr. John Cheyne informs us, in his account of typhus fever at the Hardwicke Hospital, Dublin, in the summer of 1818, that in severe cases, delirium came on at the end of the

first, or at the beginning of the second week. "At all times such patients were incapable of any stretch of attention; they answered questions satisfactorily, though with a faltering voice, but soon wandered from the subject. In many cases the delirium was of a very troublesome kind; first it was only occasional, then it continued all night, then it was uninterrupted. We had many patients who created great disturbance by wandering about the wards all night, prying into the closets, and looking under the beds. Some of these were full of their usual occupations: one man, by trade a cooper, endeavored to pull his bed to pieces, in order to make a tub of the spars." It ought, perhaps, to be stated here, that many of the patients in the Irish hospitals, were habitual spirit drinkers; and it is very probable, that in some of these cases the elements of delirium tremens may have been combined, to some extent, with those of the fever itself.

In twenty-three cases amongst females, noticed by Dr. Henderson, at Edinburgh, the delirium began, on an average, about the eleventh day. Dr. Henderson found no appreciable relation between the disturbance of the mental powers and the degree of pain in the head. The average date at which delirium showed itself amongst male patients was about the tenth day: it occurred, also, in a greater proportion of cases amongst males, and was oftener of a violent character.

Another very constant symptom, belonging to this group, consists of somnolence or stupor, in its va-

rious degrees. This is amongst the earliest phenomena of typhus fever. Dr. Gerhard says, "it was perceptible in our patients from the moment when they complained of their first symptoms. It was frequently slight, but could always be recognised by a little attention, and gradually increased until the middle period of the disease, when it was most intense; nor did it cease entirely until the strength of the patient had returned. There were usually some traces of it during convalescence. The stupor rarely passed into complete coma, except in fatal cases; hence coma was always a most unfavorable sign. Still, to a moderate extent, it was occasionally witnessed without being followed by the same danger as in ordinary diseases." Dr. Pickels observed, that in cases marked by stupor, even where there had been no delirium, the patients, upon recovery, seemed to have lost all recollection of what length of time they have been sick.

The sleep is imperfect, unrefreshing and disturbed; and it continues to be so until it lapses gradually into coma, or until the patient falls into the deep and sweet repose of commencing convalescence.

Sec. III. — *Physiognomy.* Besides the dull and stupid expression of the countenance, common both to typhoid and to typhus fever, there are other appearances of the face, more characteristic of the latter disease. These consist in a peculiar state of the skin and the eyes. They are very generally men-

tioned by writers on typhus fever, and are particularly described by Dr. Gerhard. "A constant symptom," he says, "observed in every case, was a dull, livid, red hue, of the countenance, extending nearly over its whole surface. Sometimes this color approached a purple. It coincided with a strong dark red suffusion of the capillary vessels of the conjunctiva, which appeared at the same time with it; but it usually disappeared at an earlier stage than the injection of the eyes. The conjunctiva never presented the bright red tinge or the brilliant aspect observed in acute inflammatory diseases of the brain, or of the eye itself. The expression was dull, and the blood-vessels had a dark red tinge, instead of their usual scarlet hue. The suffusion of the face and eyes was so constant, and so well marked, in the fully formed disease, that it served almost as a pathognomonic sign. It was generally most evident in patients of a full habit of body. Towards the close of the disease, the reddish color was gradually changed into a dull ashen tint, which remained until the entire recovery of the patient."

Sec. IV. — *State of the Senses.* Several of the senses are commonly more or less perverted in the course of typhus fever. Some confusion of vision is frequently present from the beginning of the disease. This is often associated with dizziness, especially on assuming the sitting or upright position. Dullness of hearing, commonly connected with ringing in the ears is also an early, and a very com-

mon symptom. Dizziness was present in five of nine cases, observed at London by Dr. Shattuck, Jr., and dullness of hearing in only one. Dr. Stewart mentions great intolerance of light as one of the most constant symptoms of the disease.

There is often a morbid sensibility of the entire surface of the body. Dr. Gerhard observed, in the Philadelphia epidemic of 1836, that "the sensibility of the skin was universally augmented, when the stupor was not so great as to render the patient insensible, or nearly so, to all external impressions. The tenderness, upon pressure, was so much increased as to induce us to refer the external soreness at the epigastrium, when pressure was made upon the abdomen, to an affection of the internal organs; but on more careful examination the sensibility was nearly equally increased in every part of the body, and was evidently external. The cutaneous tenderness was preceded by muscular soreness, which lessened as the skin became more sensitive."

Sec. V. — *State of the Muscles.* Amongst the earliest and most constant accompaniments of typhus fever is loss of muscular strength. This is almost invariably present from the beginning to the close of the disease. Even during the premonitory stage, when this exists, it is with much difficulty and effort, that the patient succeeds in keeping from his bed. Dr. Pickels, in his Report on the Typhus Fever at Cork, says, "the debility was such, that

the patient was unable, from the commencement, to rise from the bed, or to walk without assistance, and, in some instances, even without the effort of rising, fainted in bed. In a few syncope appeared as the first symptom of the onset of the disease. There is a secondary and still more extreme prostration of strength, which comes on, on the subsidence of the fever, and is attended with coldness of the extremities, and a feeble, fluttering pulse.[1]

Spasmodic twitchings of the muscles are very common in typhus, as they are in typhoid fever. Their positive frequency I am not able to give. Dr. Gerhard observed subsultus of the tendons at the wrist in three-fourths of his patients. "In the more severe cases," he says, "the subsultus extended to the muscles of the legs and face. When it appeared at the face, the corners of the mouth were drawn rapidly to one side or the other, giving a singular expression to the countenance. In the worst cases, the subsultus extended to nearly all the muscles of the body, keeping the patient in a constant state of tremor, not unlike a severe chill. The smaller muscles were much more affected than the larger ones, and there was no constant rigidity observed in any case; neither was there any paralysis." It will be seen from what has now been said, that the symptoms connected with the nervous system are even more constant and more strongly marked in typhus than in typhoid fever.

[1] Amer Jour. Med. Science, Aug. 1837.

ARTICLE V.

DIGESTIVE AND ABDOMINAL SYMPTOMS.

The appearance of the tongue in this disease is very various. In mild cases it frequently continues moist, and is merely covered with a light-colored, thin coating; this may become brownish as the disease proceeds. In other, and in grave cases, the tongue is dry, cracked, glazed, trembling when protruded from the mouth, and of various shades of color, from the light brown, already mentioned, to black. It may be of a deep, glossy red color. Sometimes, and in certain stages of the disease, it has a dark, yellowish or brown, dry stripe along its middle, while the edges are nearly clean and moist. Dr. Henderson studied the state of the tongue very carefully, in a large number of cases at Edinburgh, in 1838 and 1839. "It very early became covered," he says, "with an increased and altered secretion; white, yellow, or ash-colored; viscid, and adhering to the surface; becoming commonly thicker and darker as the disease advanced. A dry state of the tongue began chiefly in the second week of the fever, and continued for the most part without change, until, along with other symptoms of convalescence, the tip and edges assumed a moist and clean appearance, which gradually extended to the rest. The dryness was often confined to the centre of the tongue, extending in a brown streak from the point backwards."[1] Accompanying these

[1] Edin. Med. and Surg. Journal, Oct. 1839.

morbid states of the tongue, there is very frequently an accumulation of dark sordes upon the teeth and gums, and fetor of the breath. Dr. John Cheyne, in his Hardwicke Hospital Report, for 1818, says, that there was often an inability to protrude the tongue, which very awkwardly obeyed the will of the patient. "He would open his mouth, and after various unsteady motions, at length force out his tongue; and when this was accomplished it was not again drawn within the mouth until he was repeatedly admonished to that effect."

The appetite is generally destroyed, although it would seem to be less constantly and entirely wanting in typhus than in typhoid fever. Amongst the blacks at Philadelphia, in 1836, the appetite sometimes continued, and some of them asked for and ate solid food. At the Cork street Fever Hospital, during the summer of 1816, when the prevailing character of the fever was very mild, Dr. William Stoker noticed, as a remarkable peculiarity, the continuance of a considerable degree of appetite, even whilst the fever was urgent. In two fatal cases a desire for food was expressed a few hours before dissolution.

Nausea and vomiting are not unfrequently present, at the commencement of the disease; but the proportion of cases in which they occur, and the difference in this respect, if any such exists, between typhus and typhoid fever, I have no means of ascertaining. In the Philadelphia epidemic of 1836, both nausea and vomiting were extremely

rare. Dr. Gerhard says, that he scarcely found either of these symptoms noted in a single case. There may be a good deal of difference in their frequency in different seasons, and localities. I have already stated, that Dr. Pickels says the fever at Cork in 1817, 1818, and 1819, was in almost every instance, preceded by nausea, or, as the patient expressed it, by an empty straining. Dr. Anderson says, that nausea was present in fourteen of eighteen cases observed by himself, on the first day of the disease. In nine cases observed by Dr. Shattuck, at the London Fever Hospital, there was neither nausea, vomiting, nor epigastric pain. Amongst one hundred and thirty-two female patients, treated at the Royal Infirmary of Edinburgh, in 1838 and 1839, nausea and vomiting were ascertained to have been present in only twelve, chiefly at the beginning of the fever.

In a majority of cases there is very little, if any, obvious change, either in the shape or feel of the abdomen. When it is at all tympanitic, it is only slightly so. Dr. Gerhard says, that in many patients, it was either retracted, or altogether of the natural form. Dr. Stewart found moderate meteorism in only seventy-four of four hundred and sixty-three cases. Tenderness on pressure, either over the whole abdomen, or over the epigastrium, is frequently spoken of by writers on typhus fever; but it is probable, that in many cases, this has depended upon the morbid sensibility of the skin. Of Dr. Shattuck's nine cases, there was meteorism

in only one; and in this but for a single day. Oftener than otherwise, the bowels in typhus fever are constipated. This is as true of grave as it is of mild cases; and it is, also, as true of the late as it is of the early periods of the disease. Spontaneous diarrhœa is as rare a symptom in typhus as it is a common one in typhoid fever. It is hardly seen, indeed, in the former disease, excepting during certain seasons, especially in the summer and autumn, when there exists a general predisposition to intestinal irritation and inflammation. Under such circumstances typhus fever feels, as any other disease might, the influence of the prevailing pathological tendency. Dr. Stewart found diarrhœa in only twenty-three of one hundred and thirty-nine cases. Dr. Henderson, in one hundred and fifty-four cases of typhus, found the bowels easy in ninety-nine, loose in five, and costive in fifty. Dr. West, in his paper on Exanthematic Typhus, says, "The action of the bowels was not disturbed in the great majority of cases; in fact, the administration of mild laxatives was necessary, in most instances, in order to obtain an evacuation once in forty-eight hours; and in some of the most severe cases the bowels were very constipated. Diarrhœa occurred in only ten of sixty cases; in three of which the patients died, and it was only four times that it lasted longer than forty-eight or sixty hours." "The intestinal evacuations," says Dr. Henderson, "in their most disordered state, were very dark, slimy, and offensive; and in a more or less considerable degree they possessed these

characters in almost every case; a few only of the mild, and one or two of the protracted cases, having had throughout stools of a light yellow color." Dr. Edward Percival speaks of the stools, in a certain number of cases, as being "unctuous or pitchy, of a black, or greenish hue, and either preternaturally fetid, or unusually inodorous." It is hardly necessary to call particular attention to the very constant and striking difference, which exists in the condition of the bowels in typhus and in typhoid fever.

Epigastric distress and tenderness are spoken of by Dr. Cheyne, and by many others as frequently present, especially during the summer and autumn, when there are other symptoms of disturbance of the stomach. Of one hundred and thirty-nine cases, reported by Dr. Stewart, there was abdominal pain, somewhat permanent, in ninety-six; and in sixty of these it continued throughout the greater part of the illness. In most cases the pain was general; in thirty-two it was chiefly or entirely confined to the region of the liver; and in half of these it was associated with great tenderness on pressure. In eleven instances only was there any pain in the right iliac region. Dr. Stewart observes, that while in typhoid fever the pain accompanies the diarrhœa; in typhus, the pain is often most severe when the bowels are costive, and is relieved by the exhibition of a purgative.[1] Dr. Stewart found, indeed, that of seventy-

[1] Edin. Med. and Surg. Journ. Oct. 1840.

seven cases of typhus, in which diarrhœa, either spontaneous or consecutive, was noticed, there was accompanying abdominal pain in only thirty; while of sixty-two cases, in which the bowels were confined, abdominal pain and constipation coëxisted in no less than twenty-one. A similar relation between these two symptoms was noticed by Dr. West.

Hemorrhage from the bowels is of extremely rare occurrence. Dr. Henderson saw only one instance of this amongst two hundred patients, at the Royal Infirmary of Edinburgh, in 1838 and 1839.

ARTICLE VI.

MISCELLANEOUS SYMPTOMS.

I am not aware that the changes in the quantity and character of the urine in typhus fever have been, to any great extent, accurately studied. Dr. Gerhard says, that in the Philadelphia epidemic, the urine "was examined very attentively, and was remarkable merely for its extraordinary freedom from brick-red deposit, or the changes so frequently observed during the course of fever." Dr. Edward Percival says, that the quality of the urine is too variable to place any dependence upon it. This, however, is in reference to prognosis. Dr. William Stoker says, that in the early stages of the disease, the urine is scanty and high colored. Retention of the urine is not uncommon in bad cases, constitut-

ing a distressing, and, if overlooked, as it is very likely to be, a dangerous complication.

There is not much obvious wasting of the body in the early periods of typhus fever. Dr. Gerhard did not find it to become very evident until the fever began to decline.

Hemorrhage from the nostrils, so common in typhoid, seems to be not a very frequent occurrence in typhus fever. Dr. Gerhard does not mention it at all. By some writers, however, it is spoken of as a more common and important symptom. Dr. Pickels, in his Report on the Cork epidemic, says, "bleeding from the nose, though often occurring separately, in a majority of instances appeared in petechial cases. The discharge did not usually exceed a few drops, but continued to recur during some days. In two cases, however, which proved fatal, the discharge was so profuse, as to fill vessels of considerable size. Bleeding from the nose came on, in a majority, on the second day, rarely appearing later than the seventh; it was much more common amongst males than females." Dr. F. Barker speaks of its occurrence *occasionally*, and adds that no other hemorrhage is common.

Typhus fever is very generally attended with a peculiar and characteristic eruption upon the skin. The name of the disease has often been derived from this circumstance; hence it has been called petechial fever, spotted fever, maculated fever, and so on. As to the exact frequency of the occurrence of this eruption, it is impossible to speak with entire

certainty. In many cases it has probably been overlooked; and besides this, it is to be remembered that the diagnosis of typhus fever, by many who have written most extensively, and most magisterially, upon the subject, has been anything but rigorous and careful. Dr. Stewart remarks, "that the eruption of typhus was unnoticed at Edinburgh, until the attention of physicians was called to it by Dr. Peebles, in 1832; he says further — "It is also well known, to many, that, previous to a visit which Dr. Peebles made to the Glasgow Fever Hospital, in the spring of 1835, the exanthema of typhus, then found to be of general occurrence, had neither been looked for, nor registered, in that institution, and was received as a new discovery." These considerations may help to account for the differences which are to be found, in different histories of the disease, in relation to this particular subject. In the Philadelphia epidemic, Dr. Gerhard says, "it was present in thirty-two of thirty-six whites. Of the four cases, in which it was not visible, one died upon the seventh day of the disease, and the others presented slight symptoms of fever, which disappeared in the course of four or five days. It was also visible, though less distinctly, in mulattoes; and we may infer that the color of the skin alone prevented its development in the negroes."

This eruption differs, in many respects, and in a very striking degree, from that of typhoid fever. Its color, especially after the second or third day of

its appearance, is that of a duller and darker red. The spots are of a dun, dusky, purplish hue; in some cases they become almost black. They vary in size, from that of a minute point to a diameter of a line, or even of an eighth of an inch. They are less regularly circular or oval than the rose spots of typhoid fever. They are not elevated above the surrounding skin, and disappear but very partially, or not at all, on pressure. They are, almost always, much more numerous than the spots of typhoid fever; covering, in many cases, the entire trunk and the extremities. Sometimes they are spread over the skin almost as thickly as the eruption of measles. Dr. Pickels says, that in the Cork epidemic, "the spots were principally observed upon the breast, neck, shoulders, arms and thighs; rarely upon the face. From their resemblance, in some instances, to freckles, the friends of the patients, in their descriptions at the dispensary, sometimes compared the appearance of the skin covered with them, to that of a turkey egg. The mottled or marbled efflorescence, resembling measles, occurred in several."[1] Huxham says, "We frequently meet with an efflorescence, also, like the measles, in malignant fevers, but of a more dull and lurid hue, in which the skin, especially on the breast, appears as it were marbled, or variegated." Pringle's description of the eruption is in these words: "There are certain spots, which are the frequent,

[1] Trans. of Phys. of Ireland, vol. iii. p. 199.

but not inseparable, attendants of the fever in its worst state. These are less usual on the first breaking out in the hospitals; but when the air becomes more corrupted, the spots are common. They are of the petechial kind, of an obscure red color, paler than the measles, not raised above the skin, of no regular shape, but confluent. The nearer these spots approach to a purple color, the more ominous they are, though not absolutely mortal." The eruption sometimes fades suddenly or changes in its color. Dr. Stewart, amongst others, has, within a few years, studied with great care and particularity, the character and appearances of this eruption. He says, that the rash is permanent; that is, that it does not consist of successive eruptions of spots; that, in all cases, it presents the two periods, longer or shorter, of increase and decline; and, that, in the more severe cases, it may exhibit, during the period of increase, four different states, being florid, dark, livid, and petechial. When the hue of the eruption is florid, it disappears readily under pressure; when dark, it still disappears, but more slowly; when livid, semi-petechial, or pseudo-petechial, as it has been called, it is only partially effaced; and when petechial, it is not in the least affected by pressure. In many cases it remains florid throughout; in others it presents one or more, and in not a few all these alterations; and after it has reached its height, the process is inverted, and it passes through the various phases of lividity, darkness, redness, and paleness, before its evanes-

cence." Of one hundred and thirty-nine cases of typhus observed by Dr. Stewart, the eruption was pale in about one-fourth; florid in between one-sixth and one-seventh; darkish in between one-eighth and one-ninth; livid in rather less than one-ninth; and petechial in about one-eighth.

Dr. Stewart ascertained the exact time of the appearance of the eruption in fifty-two cases. This time varied from the second to the thirteenth day; but in twenty-nine cases, more than half of the entire number, it appeared on the fifth or sixth day; and in three-fourths, it appeared from the fourth to the seventh day. In forty-eight cases the eruption began to decline at different periods, from the eighth to the nineteenth day. It was still more irregular in the time of its disappearance, since this ranged from the thirteenth to the thirty-first day. The average duration of the eruption was eleven and a half days.[1]

Dr. Henderson of Edinburgh has also observed, with an attention and thoroughness not inferior to those of Dr. Stewart, the appearances of the cutaneous eruption, and very generally with similar results. Dr. Henderson noticed that, as a general rule, the progress and development of the eruption corresponded with the increasing severity of the other symptoms of the disease; and that, in like manner, the decline of the eruption was nearly simultaneous with the first signs of convalescence.

[1] Edinburgh Med. and Surg. Journal, Oct. 1840.

He found, also, that the mortality and duration of the disease were very noticeably proportionate to the abundance of the eruption. Convalescence was more protracted in those cases where it was abundant, than in those where it was scanty.[1]

In Dr. Gerhard's cases, the eruption appeared from the sixth to the eighth day, after the commencement of the disease, and gradually faded away and disappeared, from the fourteenth to the twentieth.

Other eruptions, but none of them at all constant or characteristic, are occasionally observed in this disease. Amongst them is that of sudamina, which is sometimes seen, but not so frequently as in typhoid fever. A miliary eruption now and then shows itself over the whole body, remains for a few days and then disappears; the elevated cuticle falling off in a fine, branny desquamation. Vibices are occasionally, though rarely seen, near the fatal close of the disease. Dr. Stewart met with them in only two of one hundred and thirty-nine cases; and with purpura spots in only three. Dr. Henderson saw only one vibex amongst two hundred patients, and sudamina in only three.

In grave cases, there is sometimes noticed a dark livid or purple color of the skin of the extremities; oftenest in the early, but sometimes continuing through the entire period of the disease.

General yellowness of the surface is not unusual,

[1] Edinburgh Med. and Surg. Journal, Oct. 1839.

in certain seasons, especially during the latter part of summer and in the autumn, when it is common to find other signs of gastro-hepatic derangement.

Gangrenous sloughs and ulcerations seem to be common in some epidemics of typhus fever and rare in others. At Philadelphia, in 1836, they were present in only three or four cases in a hundred. Dr. Pickels says, that gangrene of the hips, nates, and shoulders was frequent during the epidemic at Cork, in 1817, 1818 and 1819. Dr. O'Brien, in his Cork Street Hospital Report for 1820, informs us, that ulcerations and gangrene of the hips, nates, and sacrum were of very common occurrence; few of the malignant and protracted types of fever being exempt from them. Dr. Percival of Dublin says, "gangrenous extremities were extremely rare amongst my patients."

Amongst these miscellaneous symptoms may be mentioned the condition of the blood, when drawn from the body. In the epidemic at Philadelphia the blood was examined in various stages of the disease, except where the state of the patient was such as to render the operation of bloodletting clearly improper. "At a very early period, it was dark, without the buffy coat, and offered a large, but soft and dark colored coagulum. At a more advanced stage, it presented in some patients the dissolved appearance, described by various authors as characteristic of the typhus or putrid fevers." Dr. O'Brien says, "in those instances where blood was taken in the advanced period of the disease, I

have always found its texture broken down and dissolved, changing rapidly into a greenish, watery fluid, with little coagulum; indicating great dissolution of the animal fluids, and consequent great debility."[1] Huxham has described quite fully, in his usual rich and excellent manner, the altered state of the blood in typhus.[2]

CHAPTER III.

ANATOMICAL LESIONS.

The pathological alterations in fatal cases of typhus fever have not been so thoroughly and accurately studied as in those of typhoid fever. Our knowledge of the anatomical lesions, and of the condition of all the organs, after death, in the former disease, is, of course, much less complete than in the latter. Although the morbid anatomy of typhus fever has by no means been neglected by British observers, who have the best and most extensive opportunities for its investigation, it is nevertheless true, that it has never been subjected by them to any such comprehensive and detailed examination as the lesions in typhoid fever have un-

[1] Trans. of Phys. of Ireland, vol. i. p. 424.

[2] Huxham on Fevers, p. 41, *et seq.*

dergone at the hands of Louis, Andral, Chomel, Bouillaud and others. Amongst the most valuable and authentic materials for this portion of my history of typhus fever, are the results of the investigations of Drs. Gerhard and Pennock, during the Philadelphia epidemic of 1836. The number of autopsies, made by these gentlemen, during the prevalence of the disease, was about fifty; and the fruits of their researches are especially valuable on account of the entire confidence, which we may feel in their competency as pathological observers; a confidence, which we are forced to withhold from very many reporters of the morbid appearances, in this as well as in other diseases. The paper of Dr. Gerhard does not contain any particular and formal description of the state of the several organs, and this description I shall be obliged to make up from the six individual cases; the anatomical lesions in which he has minutely detailed. During the years 1838 and 1839, Dr. John Reid of Edinburgh, made careful and thorough examinations of the bodies of between forty and fifty patients, who died with typhus fever, at the Royal Infirmary of that city. These examinations are reported, and analyzed, and compared with the symptoms, in a spirit the most philosophical, and with a completeness as rarely met with as it is worthy the highest praise. They constitute a very valuable addition to our knowledge of the lesions in this disease. With the materials derived from these sources, and with such others as are accessible and trustworthy,

I shall endeavor to make out as full an account of the pathological anatomy of typhus fever, as in the present state of science it is possible to do.

ARTICLE I.

LESIONS OF THE THORACIC ORGANS.

The morbid alterations, which are found within the cavity of the chest, seem to be more constant and more important in typhus, than in typhoid fever. The lungs were more or less changed from their healthy condition in all the cases reported by Dr. Gerhard. This change generally consisted in a somewhat peculiar condensation of a portion of one or both lungs. The tissue of the lung was more solid and heavy than in its natural state; quite or nearly impermeable to the air; sometimes friable and sometimes not so; of a dark and sometimes a livid red; not granular, like hepatization, but resembling, in some degree, when torn, the structure of the spleen. This alteration was most frequent in the lower and posterior portions of the organs. The mucous lining of the trachea and bronchial tubes was, in many cases, of a rosy red color, sometimes with a livid tinge; but it was rarely changed, either in thickness or consistence.

The heart was found, in some cases, softened, flabby, and easily broken down; in others it was in its usual condition.

The appearance of the blood, contained in the heart and in the large vessels, was striking and pe-

culiar. It was of a very dark color, often almost black, thick in its consistence and sometimes oleaginous. In one case the blood in the cavities of the heart, in the aorta, the vena cava ascendens, and in the femoral vein is described as being like molasses, in color and consistence, with minute fatty globules floating in it.

In two of the four cases, examined by Dr. Shattuck, Jr. at the London Fever Hospital, the lower lobes of the right lung were of a violet color, friable, not granulated, a great quantity of reddish liquid flowing out on cutting into them. In all the cases the bronchial mucous membrane was injected, and lined by a considerable quantity of mucus.[1] The substance of the heart was not altered. In the right ventricle there were from one to three ounces of black, liquid blood, and in three cases a somewhat smaller quantity in the left.

Of forty-three cases, examined by Dr. Reid, there was more or less lesion of the lungs in all. In fifteen of these, the lesion consisted of simple congestion at the most depending portion of the organs; in thirteen cases the posterior and middle parts of both lungs were gorged with blood and frothy serum, and some portions were so dense as not to crepitate when cut, though they did not present any granular appearance; and in ten cases there was increased effusion into the bronchial tubes. In thirty-nine of these cases the brain was also exam-

[1] Med. Exam. vol. iii. p. 150.

ined; and it appears, from a careful comparison, that extensive engorgement and congestion of the lungs were more frequently found associated with those cases, in which there was increased serous effusion within the cranium, than with those where this condition did not exist; indicating some special relationship between the two phenomena.[1] In all the foregoing cases the blood appeared to be in a fluid state, or nearly so, in the large veins; but in several, a greater or less number of coagula, generally small and soft, were found in the right side of the heart. In two subjects the blood, in the same situation, was in a grumous state.

ARTICLE II.

LESIONS OF THE BRAIN.

In all the cases reported by Dr. Gerhard there was unusual engorgement of the sinuses and the larger vessels of the brain. These were filled with dark colored, fluid blood, in some cases, in the large sinuses, surrounding a soft, greenish coagulum. Inflammatory injection of the pia mater is not mentioned. Varying quantities of serum, from one or two drachms to one or two ounces, were found, in a certain proportion of cases, under the arachnoid or within the ventricles. The medullary portion of the brain was frequently of a violet tinge; otherwise the substance of the organ was unaltered. In Dr. Shattuck's cases, ob-

[1] Edin. Med. and Surg. Journ. Oct. 1839.

served at the London Fever Hospital, the organs in the cranial cavity presented no remarkable lesions. In three of them there was slight sub-arachnoid infiltration. Of forty-three cases, in which the brain was examined by Dr. Reid, there was increased effusion of serum in twenty-five. This effusion, in a majority of instances, was situated between the arachnoid and the pia mater, and was commonly moderate in quantity, in many cases elevating the arachnoid above the surface of the convolutions only at the depending portions of the brain. Nearly all these patients exhibited more or less prominent cerebral symptoms; such as delirium, coma, *subsultus tendinum*, &c.; but these symptoms were as frequently present, and as strongly marked in the class of cases where there was no increased effusion of serum as in the others. Of course it is impossible to attribute the cerebral symptoms to the serous effusion. In every case but one the blood vessels of the brain are said to have been "well filled," and their congested condition was indicated by the number of bloody spots which appeared upon the cut surfaces of the organ, although these may have depended in part upon the fluidity of the blood.[1]

Dr. John Cheyne reports a considerable number of dissections, during the epidemic of 1816, and 1817, in Dublin; but in many cases the diagnosis of the disease is uncertain; and in nearly all, the

[1] Edin. Med. and Surg. Journ. Oct. 1839.

pathological appearances are so briefly and vaguely described as to render them nearly valueless. During the summer of 1816, he speaks of finding, very frequently, what he calls appearances of inflammation in the mucous membrane both of the large and small intestines. In the following year, the abdominal viscera are represented as being generally sound, but he says: "Our expectations were never disappointed as to the state of the brain, unless that the diseased appearances in that organ were not always proportionate to the severity of the symptoms which denoted cerebral disturbance. The vessels of the head were turgid; there was increased vascularity of the brain, especially on its surface." [1]

ARTICLE III.

LESIONS OF THE ABDOMINAL ORGANS.

The mucous membrane of the stomach was more or less altered in all the cases reported by Dr. Gerhard. The most constant change consisted in softening of the membrane in the cardiac extremity, or grand cul de sac. This softening was sometimes confined to a small portion of the membrane; sometimes it was quite extensive. It varied in degree, from a moderate diminution of the consistence of the membrane to its pulpy disorganization. In some instances, the softening extended to the other coats of the stomach. Mamelonation of the mu-

[1] Dub. Hos. Rep. vol. ii. p. 30.

cous membrane, especially towards the pyloric extremity, was not uncommon. In some cases there was blue engorgement of the large veins; in some a pointed redness, and in others a continuous dull slate color of the mucous coat.

The intestinal canal, in all its tissues, and throughout its entire extent, was very constantly and remarkably free from disease. In the reported cases no appreciable lesion is mentioned, excepting occasional spots or patches of ecchymosis. The examinations were thoroughly made, and especial solicitude was felt, and corresponding carefulness was taken to ascertain accurately the state of the small intestine and its elliptical plates. Amongst the entire number of autopsies, there was but a single case, and that of doubtful diagnosis, in which there was the slightest deviation from the natural appearance of the glands of Peyer. "In the case alluded to, in which there had been some diarrhœa, the agglomerated glands of the small intestine were reddened and a little thickened; but there was no ulceration, and no thickening or deposit of yellow puriform matter in the sub-mucous tissue. The disease of the glands resembled that sometimes met with in small-pox, scarlet fever, or measles, rather than the specific lesion of dothinenteritis. In all other cases, the glands of Peyer were remarkably healthy in this disease, as was the surrounding mucous membrane, which was much more free from vascular injection than it is in cases of various diseases not originally affecting the small intestine."

"The mesenteric glands were always found of the normal size, varying, as in health, from the size of a small grain of maize to three or four times these dimensions. With the exception of a slightly livid tint, common to them and the rest of the tissues, they offered nothing peculiar either in consistence or color.

The spleen was of the normal aspect, in one half the cases; in the other half, it was softened, but not enlarged, and in one case out of five or six, enlarged and softened.

Thus, the triple lesion of the glands of Peyer, mesenteric glands, and spleen, constituting the anatomical characteristic of the dothinenteritis, or typhoid fever, although sought for with the greatest care, evidently did not exist in the epidemic typhus. Indeed, it was a subject of remark, that in the typhus fever the intestines were more free from lesion than in any other disease accompanied by a febrile movement. This exemption extended to the large intestine until the summer heats began, when a few scattering cases offered some symptoms of diarrhœa, during the prevalence of an epidemic dysentery; and, where they terminated fatally, softening and other signs of inflammation of the mucous coat of the colon were observed." [1]

The liver was found sometimes moderately softened; sometimes engorged with dark, fluid, oily blood, and sometimes spotted with ecchymosis. In

[1] Am. Journ. of Med. Sci. Feb. 1837.

many cases, however, it was the seat of no appreciable lesion. The contents of the gall bladder differed in different cases: in some the bile was viscid; in some it was thick, dark, grumous, and so on; in others it was healthy. The kidneys, in some instances, were of a darker color than natural, but commonly they were free from disease.

In Dr. Shattuck's cases the small intestine was generally healthy. The thickness and consistence of the mucous membrane were natural, and there was no lesion whatever of Peyer's patches, or of the mesenteric glands. In three of four cases there was either redness or softening of the mucous membrane of the upper portion of the large intestine. In all the cases the fecal matter, contained in the large intestine, was small in quantity, pultaceous, soft and yellowish. In two cases the mucous membrane of the stomach was unaltered; in two others, it was reddened, softened or mamelonated. There was no constant lesion in the other abdominal organs.[1] Of twenty-one cases examined by Dr. Stewart, at the Glasgow Infirmary, the aggregated follicles were distinctly elevated in two; very slightly so in eight, not elevated in five, and scarcely visible in six. In none of them was there any ulceration. Of thirty-three cases examined by Dr. Reid, in the Edinburgh Infirmary, only two presented the follicular lesion of typhoid fever, and even these doubtfully. These had been protracted cases, and

[1] Med. Exam. vol. iii. p. 150.

came from the country. Of the remaining thirty-one cases, Peyer's glands were distinctly elevated in four; visible, but not elevated in nine; scarcely visible in seven; and not visible in eleven. In none were they ulcerated.[1] The Register of Dissections, at the same institution, kept by Dr. John Home from 1833 to 1837, showed, that of one hundred and one cases, only seven presented ulcerations of the elliptical plates. In two there was perforation. These were probably instances of typhoid fever. Thickening, mamelonation, and other lesions of the mucous membrane of the stomach were found in about one fourth of the cases. The spleen was generally larger than usual, soft, and in some cases, almost diffluent. In one instance this organ weighed eleven, and in another, fourteen ounces.

The petechial eruption frequently continues visible after death. In three of four cases examined by Dr. Shattuck, the spots penetrated the thickness of the skin to the subcutaneous cellular tissue, and communicated to the parts they occupied a purplish color.

Amongst the pathological phenomena of typhus fever, may be mentioned the tendency which manifests itself, in a certain proportion of cases, to early and rapid decomposition. Dr. Pickels, in his Report on the Typhus Fever at Cork, says, that this tendency was shown by the rapid putrefaction of bodies after death, rendering necessary their almost

[1] Ed. Med. and Surg. Journ. Oct. 1839.

immediate interment. In many instances the skin of the arms, thighs, and of almost the entire body changed to a deep livid or black color, somewhat of the appearance as if scorched by gunpowder, several hours before death.[1] Dr. Gerhard noticed, that rapid putrefaction took place, especially in the bodies of those patients from whom the offensive, ammoniacal odor, already spoken of, had been most strongly perceived during life.

CHAPTER IV.

CAUSES.

I shall enumerate, under this head, some of the principal circumstances, which appear to favor the occurrence and spread of typhus fever. Our knowledge of its efficient causes, excepting that of contagion, is very limited and imperfect.

There is no evidence, that this disease is confined to any period or periods of life. During its prevalence at Philadelphia, in 1836, children were rarely attacked by it; but, after childhood, age seemed to exercise little or no influence upon the susceptibility to the disease. Amongst the whites, where the age could be better ascertained than amongst the blacks,

[1] Trans. of Phys. of Ireland, vol. iii. p. 202.

there were as many patients over thirty-five years old as there were under this age. Dr. Edward Percival, in his Report on the Epidemic Fevers of Dublin, at the Hardwicke Fever Hospital, during the years 1813, 1814, and 1815, says, that the disease prevailed continually amongst the boys and girls of the Bedford Asylum; characterized by petechiæ, great failure of strength, a turgid countenance, and considerable stupefaction.[1] Eleven hundred of these children were crowded together in a building, originally intended to accommodate only six hundred. Of three thousand nine hundred and seventy patients, received into the Cork street Hospital, Dublin, in 1817 and 1818, there were, under ten years of age, three hundred and sixty-two; from ten to twenty years, fourteen hundred and seventy-four; from twenty to thirty years, twelve hundred and sixty-five; from thirty to forty years, five hundred and eight; from forty to fifty years, two hundred and forty-one; and over fifty years, one hundred and twenty.[2] Dr. Barker says, that in the course of the epidemic of the above mentioned years, he witnessed the disease in many children under the age of four or five years, and in its most exquisite form, that of petechial fever. It will be found, from extensive observations, that a large proportion of the cases of typhus fever occur in persons, who are between the ages of fifteen and thirty years; but it would be very unsafe to infer from this fact any-

[1] Trans. of Phys. of Ireland, vol. i. p. 288. [2] Ibid. vol. ii. p. 533.

thing positive as to the *liability* of different ages to the disease, unless we have first ascertained the whole number of persons, of these different ages, exposed to the causes of the fever. From not attending to this and other circumstances in these calculations; from not taking into account all the elements of the problem to be solved, many writers have lost themselves on what Dr. Arrott, of Dundee, calls the "quicksands of false arithmetic."

The average age of forty-seven patients, in whom the disease proved fatal, at the Royal Infirmary of Edinburgh, in 1838 and 1839, was thirty-five years and a half, nearly.[1]

New residents in any given locality seem to be somewhat more liable to typhus than others; although this circumstance has so little influence, that it has not been often spoken of by British writers. According to a table published by Dr. Davidson, of five hundred and sixty-eight patients with typhus, admitted into the Glasgow Fever Hospital in 1838, and 1839, one hundred and seventy-six, or one-third, nearly, were natives of the city; one hundred and ten had been residents less than six months; fifty-five, from six months to a year; ninety-seven from one year to five; and one hundred and thirty, from five years to twenty and upwards. Thus more than half of the whole number had lived in the city five years or upwards.[2]

Typhus fever prevails at all seasons of the year.

[1] Ed. Med. and Surg. Jour. Oct. 1839.

[2] Dunglison's Medical Library.

Several of the Irish writers have remarked, in general terms, that the disease is found to prevail most extensively during the early part of summer. It seems probable, however, from extensive and accurate researches, that the difference in the extent to which the disease prevails in the different seasons of the year is not very great. Illustrative of this point, so far as a single locality is concerned, I copy the following table from Dr. Mateer's statistics of fever, during a period of eighteen years, at the Belfast Fever Hospital. It shows the aggregate number of admissions into the hospital, arranged according to the four seasons, for this long and continuous series of years, with the average rate of mortality for the several seasons.

Summer	2596	1 to $17\frac{27}{37}$ for Summer.
Autumn	2482	1 to $15\frac{7}{78}$ for Autumn.
Winter	2359	1 to $14\frac{1}{2}\frac{1}{5}$ for Winter.
Spring	2412	1 to $13\frac{3}{4}\frac{1}{4}$ for Spring.

It appears, from this table, that the influence of season in favoring the prevalence of typhus fever, is small. It appears, also, that the rate of mortality is highest in the spring and winter.[1]

The influence of sex in predisposing to typhus fever is not very great. It has been generally remarked by Irish observers, that the disease is somewhat more common amongst females than it is amongst males. This fact may be in part, perhaps

[1] Dub. Jour. of Med. Sci. vol. x. p. 34.

entirely, accounted for, by the more constant exposure of the females to many of the most active causes of the disease. From Dr. Mateer's statistics it appears, that of 9588 patients admitted into the Belfast Fever Hospital between May, 1813, and May, 1835, inclusive, 5130 were females, and 4458 were males.

It is very evident, that the geographical boundaries, within which typhus fever prevails, as a common and more or less constant disease, are much less extensive than those of typhoid fever. The actual extent to which typhus fever has heretofore prevailed, in different regions and countries, owing to the imperfect histories which have been left to us of this and of analogous diseases, and the consequent doubtfulness and uncertainty of our diagnosis, is a matter which it is now impossible to determine with any considerable degree of precision. One thing is very certain, and that is, that typhus fever has always been of very rare occurrence in New England. Nathan Smith, one of the great observers of New England diseases, says, expressly, that he never met with any other form of continued fever, than that which he has so well described under the then common name of *typhous fever*, and which was, evidently, the typhoid fever of this work. Very few of the New England physicians, now living, I presume, have had an opportunity of seeing typhus fever on their own soil; excepting now and then a few instances in cases of foreigners recently arrived from Britain. Three

such cases have fallen under my own observation during the present summer, 1842. In one of them, a boy thirteen years of age, the disease was clearly and strongly marked. For the first week there was great stupor, delirium, a dark suffusion of the eyes; the skin was fuliginous, congested, and covered with a dusky, mottled efflorescence. The whole aspect of the patient struck his physician, Dr. Dalton, as being very different from that which is presented in our every day typhoid fever; and upon inquiry, it was ascertained, that the lad had recently arrived in the barque Barlow, from Greenock, and that there had been some forty or fifty cases of fever, and several deaths, on board the ship, during her passage. The other two patients had recently arrived in the Eutaw, from Liverpool, and were received into the Massachusetts General Hospital. In both of them there was a very abundant, diffuse, ill-defined eruption, of a dusky red color, very partially disappearing on pressure, or not at all. Some of the spots, especially upon the extremities, were petechial. In other respects the symptoms corresponded very closely with those exhibited in the boy from the Barlow. The cerebral disturbance was marked in all, and the abdominal symptoms were either very slight or wanting. A continued fever, which seems to have been evidently contagious, prevailed in the Boston Alms House, in 1817. The account of it, however, which was published in the New England Journal of Medicine and Surgery, for April, 1818, by Dr.

John B. Brown, is not sufficiently detailed and particular to enable us to decide whether it was typhus or typhoid fever. Many cases are annually received into the hospitals of our large cities, especially those of New York, from the British emigrant vessels. The ship Eutaw arrived at New York, March 6th, 1842, forty-two days from Liverpool, with about two hundred passengers, mostly Irish, seventy of whom were sick with typhus on her arrival. Amongst these there were eight deaths. The barque Barlow arrived at New York from Greenock, May 15th, 1842, after a passage of forty days, with nearly fifty typhus patients; there having been three deaths before her arrival. These are instances of what occurs nearly every year. In August, 1840, twenty-one cases of typhus were admitted, from a single vessel, into the Boston Alms House. Four of the cases were fatal. Dr. Butler informs me, that the dullness of the mind, deafness, stupor, suffusion of the eyes and dinginess of the skin, were amongst the most prominent symptoms. The bowels were usually torpid, and there was slight meteorism in only two or three cases. Dr. Doane, physician at the New York quarantine establishment, informs me, that amongst the most striking and constant phenomena of the disease he has noticed the injection of the eyes, the fuliginous aspect of the skin, and deafness. Diarrhœa is rare, and the alvine discharges, when procured by medicine, are dark-colored and offensive. The evidences of the contagious character of the dis-

ease, observed by Dr. Doane, are very positive: during his connexion with the institution, a period of about three years, no less than fifteen or sixteen individuals, connected with the hospital, having died with typhus fever, which had been contracted from the emigrant patients.

The disease, which was commonly called spotted fever, and which prevailed in many parts of New England, principally between the years 1807 and 1816, is supposed by some writers to have been the true typhus fever. Dr. Gerhard says, that it was similar in its nature to the British typhus. Dr. James Jackson thinks, that it was a different disease. It is very certain, that in many important particulars, it bore a very striking resemblance to true typhus. This resemblance is noticed by most writers upon the disease. Dr. Elisha North called it *a new petechial malignant typhus*. Dr. Hale, of Boston, whose description of the disease, as it prevailed at Gardiner, Maine, in the spring of 1814, is the fullest and best that has been published, regards it as a congestive fever. He speaks of the many points of resemblance which exist between it and Dr. Armstrong's typhus; but he says, also, that there are many strong points of difference between the two diseases. It is not easy, at the present day, upon such evidence as we possess, to decide with any confidence, upon the precise character of the spotted fever of New England. Without going any farther into the consideration of this question here, I will merely observe, that an exami-

nation of most of the records that have been left us of this disease, has induced me to believe, that it belongs to that class of new and more or less temporary epidemics, — each having its peculiar character, marked by its peculiar phenomena, and depending upon new and peculiar combinations of unknown morbific influences, — which have always, from time to time, made their appearance, rather than to the class of established and permanent maladies.

Dr. Gerhard thinks, that some of the epidemics which overran the Middle States, between the years 1812 and 1820, were of typhus fever; and that it was of this disease, that three distinguished professors in the University of Pennsylvania — Rush, Wistar and Dorsey — died. He says, that Dr. Parrish, one of the most experienced physicians of Philadelphia, who practised very extensively amongst all classes of inhabitants, in the winter of 1812–'13, when he saw some of the cases at the Philadelphia Hospital, in 1836, immediately recognised their identity with those of the former epidemic. A pupil of Dr. Gerhard's from North Carolina, informed him, that he had witnessed a similar fever amongst the negroes. It seemed to be contagious, and from the absolute disregard of cleanliness and the crowded state of the negro cabins, it frequently spread extensively. It is hardly necessary to say, that these and similar opinions are to be received with a good deal of caution; and that the extent and frequency of the prevalence of true typhus fever in

the United States can only be determined by the accurate and continued observations of the future. Upon this question, as upon so many others connected with epidemic disease, the past sheds but a confused and uncertain light.

It is very clear, that for the last twenty-five years, at least, true typhus fever has been almost or entirely unknown in France. In the years 1813 and 1814, there appeared at Paris a severe epidemic fever, which was first noticed amongst the troops who returned from Napoleon's campaigns in Germany, and the east of France; and which afterwards spread amongst the inhabitants of Paris and other large cities, and was everywhere extremely fatal. This epidemic Dr. Gerhard is disposed to believe was typhus fever, although Louis, Chomel, and other French physicians, who observed it, are inclined to regard it as identical with their prevailing typhoid fever, or dothinenteritis.

A writer in the October number of the British and Foreign Medical Review for 1841 thinks, that the fever which devastated Italy in 1816 and 1817, was identical with the typhus of Great Britain.

Typhus fever has been almost universally regarded, by those physicians who have enjoyed the best and most extensive opportunities for observing it, as a disease capable of direct transmission from one individual to another by means of contagion. Amongst others, of the older British writers, who maintained this opinion, may be mentioned Willis, Huxham, Grant and Pringle; and amongst the

moderns, there are but few who dissent from it. Different observers, differ, it is true, amongst themselves, in regard to the extent to which the principle of contagion operates in the propagation of the disease, and in regard to some other points connected with this subject; but they very generally admit the fundamental fact of its contagious transmissibility. Dr. O'Brien, in a Dublin Fever Hospital Report, for 1819, in allusion to this matter, says, "that the skepticism of one or two individuals has gone so far as to deny the existence of contagion altogether in the fevers of our climate," but that the opinion is so singular, and so contrary to the general sense of mankind, that little attention has been deservedly paid to it.

The extreme doctrine in regard to the contagiousness of typhus fever is, that the disease is exclusively and invariably the product of contagion; that it never arises from the action of other causes alone; that it is never spontaneous, as it is called, in its origin; that it resembles, in this respect, smallpox, and not scarlatina. This opinion is not generally entertained, and must have been always the result rather of philosophizing than of observing; for, certainly, the evidence of direct observation is altogether against this exclusive opinion. It is easy to see, that the accurate settlement of a question of this character is exceedingly difficult; and that where a considerable number and variety of influences are or may be acting together in the production of disease, it must be often quite impossible to

determine, with any degree of certainty, the actual and comparative agency of each. One thing, however, in regard to the present matter, is perfectly clear; and that is, that in very many cases, there is no positive evidence, whatever, of the action of contagion. Dr. Edward Percival says, "having made it my business to inquire into the origin of most cases of fever, that were admitted to the Hardwicke Hospital, during several years, I found the results to point less frequently and precisely to a contagious source than I should have anticipated."[1] Dr. F. Barker observes, that of ninety patients in the Cork Street Fever Hospital, in October, 1817, of whom minute inquiry was made in relation to this point, only twenty-four could refer their cases to the effects of contagion.[2] From a pretty careful, and certainly an unprejudiced, examination of this subject, in the observations and opinions of British writers, I think we may look upon it as well settled, that the morbid actions constituting typhus fever are capable of generating in the body a poison, which, when concentrated, and aided in its operation by favoring circumstances, will produce the same disease in persons exposed to its influence. We may consider it, also, as not less certain, that the same poison may be generated by other agencies; amongst the most active of which seem to be the crowding together in close, unventilated apartments, amidst accumulated personal filth, of the

[1] Trans. of Phys. of Ireland, vol. i. p. 287. [2] Ibid. vol. ii. p. 530.

wretched and suffering poor. I shall state some of the grounds upon which these conclusions rest.

Dr. O'Brien, in his Cork Street Fever Hospital Report for 1816, states, that of nine physicians, who had been permanently attached to the institution, five had had the disease, in two of whom it proved fatal. Of the four who escaped, two had had contagious fever before their connection with the hospital. All the nurses, employed in the hospital, had suffered from the disease.[1] Of the medical men connected with the South Fever Asylum, at Cork, during the epidemic of 1817, 1818 and 1819, seven physicians, the apothecary, and his apprentices, contracted severe fevers. Two of the physicians died. Nearly all the other persons, connected with the hospital, and who, from the nature of their occupations, were in frequent and close communication with the sick,—the hair cutter, the porters, the nurses,—were attacked with the fever.[2] At the Hardwicke Fever Hospital, Dublin, in 1816, all the nurses and other residents in the hospital, amounting to twenty-three persons, escaped the disease. Dr. Cheyne attributes this exemption to the cleanliness and free ventilation of the institution.[3] Still, it appears, that in the following year many of the officers of the same establishment caught the fever. Amongst them were eight or nine medical gentlemen, the steward, all the servants, in succes-

[1] Trans. of Phys. of Ireland, vol. ii. p. 485.
[2] Ibid. vol. iii. p. 224.
[3] Dublin Hosp. Reports, vol. i. p. 55.

sion, whose business it was to remove the clothes of the patients upon their first admission, and most of the unseasoned nurses.[1]

It may be added, in connection with this subject, that nothing is more common, during the prevalence of typhus fever, than for a considerable number of individuals, residing in the same room, to be successively attacked with the disease. In many instances, all the members of a large family, and even of several families, inhabitants of the same house, have, one after another, become its subjects. This common occurrence is noticed by most of the Irish writers upon fever. Of 9,588 patients received into the Belfast Fever Hospital, from 1818 to 1835, 2,342 came in single cases, while 7,246 came in numbers of two or more from the same family. They came from 1,856 families, thus giving an average of nearly four patients to a family.[2] One of the circumstances which early attracted the attention of Dr. Gerhard, in the Philadelphia typhus of 1836, was the fact, that the patients came in groups, and several from the same house. Amongst the first admitted into the hospital, were seven negroes, the entire population of a cellar, in the lower part of the city. This occurrence of several cases in the same house has been but very rarely observed amongst the comfortable and rich classes in Ireland. Under these circumstances, the fever has not usu-

[1] Dub. Hosp. Reports, vol. ii. p. 53.
[2] Dub. Jour. of Med. Sci. vol. x. p. 35.

ally extended to more than a single member of a family.

The latent period of the contagious principle has not been accurately ascertained. It is probably different in different cases. Dr. Barker says, that in many instances it seems to extend to two or three weeks. Dr. Perry, of Glasgow, intimates, incidentally, in his letter on typhus fever, published in the Dublin Journal of Medical Science, for January, 1837, that the disease rarely, if ever, makes its attack in less than eight days from the time of exposure. The same gentleman says, that numerous observations and experiments have satisfied him, that typhus fever does not communicate its contagious principle before the ninth day of the disease, and perhaps not till a later period. Many very striking instances are recorded, however, by different writers, in which the disease seems to have been directly and immediately received from a patient laboring under it, and to have instantaneously manifested itself. Dr. Henry Marsh, of Dublin, in a paper upon the origin and latent period of fever, published in volume IV. of the Dublin Hospital Reports, enumerates twenty cases of this sort. He says, that they constitute a few, amongst many facts of the same kind, which he has been able to collect, and that every day's observation adds to their number. In most of these instances, the persons, many of whom were nurses or physicians, while in the act of rendering some service to the sick, which exposed them to the strong, offensive

odor arising from the beds or bodies of the patients, were immediately seized with headache, great prostration of strength, and with nausea, perhaps, or rigors; and these symptoms were soon followed by the full development of the disease; in many of which cases it proved fatal. He mentions the deaths of three physicans, Dr. Crawford, Dr. James Clarke, and Dr. Waring, under such circumstances. Two cases of a similar kind are reported by Dr. Gerhard, in his account of the Philadelphia typhus of 1836. He says, "the nurse was shaving a man, who died in a few hours after his entrance; he inhaled his breath, which had a nauseous taste, and in an hour afterwards was taken with nausea, cephalalgia, and ringing in the ears. From that moment the attack of fever began, and assumed a severe character. The assistant was supporting another patient, who died soon afterwards; he felt the pungent sweat upon his skin, and was taken immediately with the symptoms of typhus." It would be easy to multiply, and that to a great extent, similar examples.

The entire history of typhus fever shows, conclusively, that it is often very intimately dependent upon that unknown influence, or combination of influences, to which the term epidemic has been applied. After estimating, as nicely as our means will enable us to do, the agency of the several supposed causes, exciting and predisposing, of the disease, we are still unable to account for its general prevalence, during certain periods, and over more

or less extensive regions, without resorting to this ancient hypothesis of an occult influence or agent, coming, we know not whence, — whether from the earth, the air, or the stars, — and acting we know not how, in the production of its results. In the case of typhus fever, as of many other diseases, of scarlatina, of measles, of smallpox, it is evident, that independent of all the circumstances which are admitted to favor its occurrence and its extension, there exists at certain times, a predisposition or tendency to the disease, which we are wholly unable to account for or explain. Like the smallpox, and like scarlet fever, it is always present in Ireland, but at considerable intervals, we find it increasing immensely in the extent of its prevalence, and after the lapse, usually, of from one to two or three years, again subsiding to its permanent and average standard.

Amongst the circumstances, which, to say the least of them, are very frequently associated with the presence of typhus fever, are the crowding of persons together in dark, damp and badly ventilated apartments; anxiety; fatigue; excesses; exposure to the inclemencies of the weather; and scanty and poor food. The real and relative agency of these several influences in the production of the disease has not been very minutely and carefully studied, but there can be little doubt, that they are often amongst its most powerful and prolific causes.

The very intimate connexion of typhus fever with crowded, illy ventilated and filthy apartments,

has been universally admitted. This is the pestilence which dogs the footsteps of retreating and discomfited armies, and takes up its dwelling in their tents; which hides itself within the dark and noisome walls of ancient prisons; which lurks, amidst destitution and vice, in the narrow lanes and unlighted cellars of great cities, and which has been, for many generations, the perpetual inmate of the low, mud cabins of the Irish poor.

As to the effects of the sensible qualities and changes of the weather, nothing very positive seems to have been ascertained. These effects are doubted by some observers, and not agreed upon by others, who admit their existence. Thus Dr. Percival says; — "It has long been observed, that protracted dry weather is peculiarly productive of fever in Dublin;" and Dr. Cheyne says, — "more than thirty years ago, it was remarked by a very eminent physician, the late Dr. Quin, that wet and cold summers always proved healthy ones in Dublin." Still, the same excellent observer informs us, that the summers of 1816, and 1817, when fever was extensively prevalent, were wet, cloudy, and cold; and Dr. Barker makes the following remark, — "the state of the weather, as to moisture, has been said to have affected the progress of this fever in other parts of Ireland. I cannot say, that I have observed this in Dublin, although I have kept a register of the weather during several years past."[1]

[1] Trans. of Phys. of Ireland, vol. ii. p. 527.

Dr. Henderson, in his account of the epidemic at Edinburgh, in 1838, and 1839, says, that cold weather had commonly the effect of increasing the number of admissions into the Infirmary, which declined again when the temperature was moderate.[1] Dr. James Arrott, of Dundee, remarks, that all his inquiries tend to prove that great vicissitudes of the weather, and especially that great degrees of cold and wet, are powerful causes of typhus.[2]

The connexion of the great typhus epidemics of Ireland with a general scarcity of food, has long been noticed. It has been estimated, that during the years 1740, and 1741, eighty thousand persons died in Ireland, of fever, dysentery and famine. Dr. Rutty, then a practising physician in Dublin, informs us, that "in the autumn of 1740, there was a great dearth of provisions in Ireland, which proceeded almost to a famine in winter, the potatoes having failed, whilst other provisions bore double or treble their usual price." A subsequent epidemic of 1800 and 1801, was also attended by a great scarcity of provisions. Again, the terrible epidemic of 1817, 1818 and 1819, was preceded, and during a portion of the time at least, and in many places, accompanied by a dreadful deficiency of even the commonest food. There are few darker pages in the long, sad annals of Irish poverty and disease, than that upon which is written the history of this

[1] Edin. Med. and Surg. Journal, Oct. 1839.
[2] Ibid, vol. li. p. 127.

epidemic.[1] The crops of 1816 had almost entirely failed, and the same thing was true, to a considerable extent, of the following year. Not only was a large portion of the grain destroyed by the unfavorable weather, but the little that was saved was of a poor quality.

It would be wrong, however, to attribute this or any of the preceding epidemics to famine alone. Typhus fever is constantly present in various parts of Ireland, and it has, more than once, extensively prevailed, when the harvests had been good and food unusually abundant. This is only one of many coöperating influences, to which the wide-spread prevalence of the disease is to be attributed.

Many of the Irish writers often speak of having seen typhus fever occurring several times in the same individual. Others have remarked, that a second attack of the disease is very rarely witnessed when the first had been severe, or when it had been attended by an abundant eruption. Dr. Perry, of Glasgow, in a letter to the editors of the Dublin Journal of Medical Science, says, — "I have, for some years, entertained the opinion, founded upon an extensive series of observations, that contagious

[1] Let me add, in a note, that many of these otherwise gloomy pages are made radiant and luminous with affecting examples of the patient resignation of the poor sufferers; and of the self-forgetfulness and devotion of the Roman Catholic clergy, the physicians, and other benevolent friends of the sick. Few incidents in medical biography are more touching and beautiful than the sketch, which is given of the early death of young Gillichan of Dundalk, one of the many martyrs to science and humanity, whose brief lives shed light and glory on the history of our art.

typhus is an *exanthematous disease*, and is subject to all the laws of the other exanthemata ; that, as a general rule, it is only taken once in a life time, and that a second attack of typhus does not occur more frequently than a second attack of smallpox ; and, judging from my own experience, less frequently than a second attack of measles, or scarlet fever." Dr. Stoker speaks of the poor as having frequent attacks of fever in the course even of a short life, and thinks that few adults have escaped these attacks, although he has no doubt that the succeeding attacks are milder than the first. Dr. O'Brien, in one of his hospital reports, says, — " some of the nurses have had the disease three or four times." Dr. Barker thinks, that if the measly eruption is full, second seizures are very rare, and that the liability to these is less in proportion to the duration and severity of the first attack.

CHAPTER V.

VARIETIES AND FORMS.

The only varieties of typhus fever, which are at all satisfactorily established, are such as depend upon different degrees of severity, and such as are more or less constantly connected with the different

seasons of the year. The proportion of mild to grave cases varies considerably under different circumstances, but it is almost always very great. Cases of all degrees of intensity, from the mildest to the most severe and malignant, just as happens so frequently with scarlatina and smallpox, are often found together, under the same circumstances, and apparently depending upon similar causes.

During the winter and spring the disease is more likely to be seriously complicated with pulmonic affections. In the summer and autumn it is frequently associated with gastro-intestinal irritation. The disease, in certain places, and for a limited period of time, is occasionally marked by certain peculiarities. Dr. John Cheyne remarks, that he never witnessed continued fever with so many inflammatory symptoms as in the spring and summer of 1816, at Dublin; and that the blood was sizy in nearly one-half of the patients who were blooded. In August and September the cases were often complicated with dysentery and with symptoms of gastro-hepatic derangement. A distressing nausea was common, with a bitter or foul taste and a yellow tongue. After this period the fever became more severe in its character, and was frequently complicated with an inflammatory state of the bowels.[1] In December and the following January, many cases were attended with inflammation of the bron-

[1] Dub. Hosp. Rep. vol. i. p. 15, *et seq.*

chial mucous membrane. The same writer says, that of one hundred and seventy-five patients admitted into two wards of the Hardwicke Hospital, during the months of April, May, and June, 1818, at least three-fourths had cough with pains or stitch, oppression in the chest, and quickened respiration."[1] But these varieties are in no degree more numerous, or more important, than those which are observed in the history of all epidemic diseases. Certain individual symptoms or phenomena may be frequent at one time and place, and rare at another. The occurrence of epistaxis, for instance, or of relapses, or of some consecutive affection, may be much more common in one season than in another. Dr. John Cheyne says of the fever at Dublin in 1816, — "relapses, which rarely occurred in summer, were uncommonly frequent in winter."

CHAPTER VI.

DURATION AND MARCH.

The duration of typhus fever varies very considerably in different cases and under different circumstances. Death often takes place at an earlier

[1] Dub. Hos. Rep. vol. i. p. 15, *et seq.*

period than ever happens in typhoid fever. Dr. O'Brien says, that death is not unfrequent on the fifth or sixth day of the disease. Dr. Pickels remarks, that the disease, when fatal, rarely exceeded the eleventh or thirteenth day, and in many cases, that it was much shorter. Dr. Edward Percival noticed, that death was most common between the eleventh and seventeenth days. Dr. Bracken of Munster, in a communication to Drs. Barker and Cheyne, says, that in the epidemic of 1817, 1818, and 1819, the greatest number of deaths took place on the ninth day; and then, successively, on the tenth, twelfth, eleventh, seventh, and eighth.

The statements of most of the Irish writers, in regard to the average duration of the disease, are not, I think, to be very confidently relied upon. They do not tell us in what manner the duration was estimated, nor what mode was adopted for fixing the commencement and the termination of the cases. Dr. Lyne, of Fralee, says, that in the epidemic of 1817, 1818, and 1819, the duration of the disease ranged from five to twenty days; the average period being fourteen days.[1] Dr. Bracken, of Munster, estimates the average duration in the same epidemic, at nine days, before puberty, and at fourteen days, for adults.[2] Dr. Pickels, in his Report of the South Fever Asylum, at Cork, for 1817, 1818, and 1819, says, that of fifty-nine cases, taken in succession, under the age of sixteen years, and

[1] Barker and Cheyne's Account, etc. vol. i. p. 154.

[2] Ibid. vol. i. p. 304.

which recovered, thirty-seven did not exceed the tenth day, and twenty-two did; and that of sixty cases, over the age of sixteen, which recovered, nine did not exceed the tenth day, and fifty-one did.[1] The testimony of the Irish observers is very unanimous as to the shorter duration of the disease amongst the young than amongst adults. It is less, also, in mild than it is in grave cases. Dr. Stoker found at the Cork Street Hospital, Dublin, in the summer of 1818, that of four hundred and seventy-one cases, mostly mild, nearly three-fourths terminated on or before the seventh day.

Dr. Mateer, of Belfast, makes the average duration of typhus fever considerably greater, than most of the British writers have made it. This may depend in part upon his more accurate investigation of this subject, and in part upon his adopting a different mode of fixing the termination of the disease. His calculation is founded upon 11,209 patients, treated, during a series of nearly twenty years, in the Belfast Fever Hospital. He found, that the average period, during which the patients remained in the hospital, under the disease, was about twenty-two days; and that they had, on an average, been ill about seven days, before being brought to the hospital. This would give to the cases a mean duration of twenty-nine days. It is important, however, to observe, that the termination of this average period is fixed, not at the com-

[1] Trans. of Phys. of Ireland, vol. iii. p. 203.

mencement of convalescence, but at the reëstablishment of health. The mean time at which, even according to Dr. Mateer's calculations, the disease, in cases which terminate favorably, reaches its highest degree of severity, and begins to retrograde towards recovery, is about the fourteenth day. "During these twenty-nine days," he says, "the complaint progresses for a definite period, till a certain point of intensity is attained; after which, if a fatal event have not taken place, the symptoms diminish in severity. This point, commonly termed crisis, occurs at some fixed time. In one hundred consecutive cases, carefully noted for this purpose, it was found, on a mean calculation, that the fourteenth day was that on which the crisis took place, or nearly about one half the time which, as we have already seen, the whole course of fever takes up in each individual. So that it would seem to be proved by extensive observation, that the disease takes up one half of twenty-nine days to progress, and the remainder to retrograde; or, in other words, that the periods of increment and of decrement in the intensity of the symptoms in fever, are equal and proportional."[1] Dr. Alexander P. Stewart says, that the mean duration of typhus fever at Glasgow, calculated from the results of many thousand cases, during successive years, is about twenty-one days.[2] Dr. Henderson says, that the average date of commencing convalescence, at the Royal

[1] Dub. Jour. Med. Sci. vol. x. p. 41.

[2] Edin. Med. and Surg. Jour. Oct. 1840.

Infirmary of Edinburgh, in 1838 and 1839, was the thirteenth day. The average period at which death took place, calculated from forty-three cases, was between the twelfth and the thirteenth day.[1]

Typhus fever is not often followed by chronic affections, which can be referred to the previous disease. Dr. Cheyne, and some others, speak of an occasional case of phthisis, chronic rheumatism, hydrothorax, and so on, as amongst the sequelæ of typhus fever; but the general testimony of the Irish physicians is against the frequency of such results. This is striking in the Reports from many districts of the country, which are published in Barker and Cheyne's account of the epidemic of 1817, 1818, and 1819. They almost all agree in saying, that the disease rarely left any dreg behind it.

True relapses would seem to be very rare. Dr. Stewart says, that however long may be the period of excitement, however long the adynamic stage, however tedious the period of convalescence, he has never, amongst thousands of cases, seen a single case of relapse, in the proper sense of the term, after the symptoms had begun to decline.[2] Dr. Edward Percival says, that relapses were extremely rare at the Hardwicke Fever Hospital; while Dr. Pickels speaks of them as common, though mild, at Cork. Dr. Alfred Hudson, in his elaborate Inquiry into the sources and mode of action of the Poison of Fever,

[1] Edinburgh Med. and Surg. Journal, Oct. 1839. [2] Ibid. 1840.

informs us, that in five hundred cases of fever admitted into the Navan Hospital in 1840, only two instances of true relapse occurred.[1]

Many of the Irish writers on typhus fever allege, that in very frequent instances, the disease terminates in what has been called a *crisis*. That the commencement of convalescence, in this as well as in many other diseases, should be formally and pretty clearly marked, by certain phenomena of a decided character, is what we can easily understand, and what we frequently see. The coming on, after its long absence, of quiet and protracted sleep; accompanied, as this grateful and refreshing visitation often is, with a diminution in the frequency of the pulse, a restoration of the integrity of the mind, and a change in the state of the skin, from an arid heat to a warm, gentle and equable moisture, most certainly indicates a great and radical revolution in the condition of the system, which may well be called *a crisis*. But something more than this formal and obvious change in the state of the living tissues from a morbid to a healthy action, is often meant, I think, by writers who speak of these *crises* in typhus and other fevers. They tell us of a violent struggle in the suffering economy, which precedes and accompanies the transition of the functions from their diseased and perturbed action to their natural and easy play. They speak as though the recuperative powers of the system,

[1] Dunglison's Medical Library.

almost worn out or overcome by the morbific influences which have obtained possession of the organs, had now gathered up and concentrated all their remaining energies; had now taken their desperate and final stand against the further inroads and ravages of disease; and as though the perturbation resulting from this conflict constituted the critical struggle, terminating, as the case might be, either in recovery or in death. This is neither an unfair nor an exaggerated statement of the views of these observers. Thus, Dr. Percival, in his Hardwicke Fever Hospital Report, for 1813, 1814, and 1815, says: "The critical period was often a scene of severe struggle, the issue of which was for many hours doubtful. An obscure rigor would set in on the eve of the fourteenth day, or later; delirium and jactitation would increase, the extremities become cold, respiration hurried and oppressed, the countenance pale and anxious, and the pulse, by its frequency, smallness and irregularity, scarcely numerable. The patient would often moan loudly from pains referred by him to the bones of his back and limbs. This struggle usually increased for some hours, and then subsided into relief or the gradual extinction of life."[1] Dr. Percival, also, expresses the opinion, that the term of convalescence was lengthened or shortened in proportion as the crisis was fully or obscurely formed. Dr. Cheyne, in his Hospital Reports, makes very frequent mention of crises,

[1] Trans. of Phys. of Ireland, vol. i. p. 299.

marked by rigors succeeded by sweats. He noticed this termination of the fever much oftener during some periods than in others. Thus, he says, that between the 12th and the last of May, 1817, amongst fifty-nine patients, admitted into the Hardwicke Hospital, there were twenty instances of this form of critical resolution, although previous to this time he had good reason to think, that such a termination was exceedingly rare. "The rigor of crisis," as Dr. Cheyne calls it, he says rarely lasts long; perhaps only a few minutes, perhaps half an hour or an hour. Another form of crisis is thus characterized by the same accurate observer: "A state of restlessness and anxiety, with flushing of the face, rapid pulse, frequent laborious breathing, and increased heat of the surface, with great distress at the pit of the stomach from heat, tenderness or pain; which distress was not unfrequently relieved by vomiting. The patients were in a state of universal uneasiness, which would have been truly alarming had we not known its tendency; but this state is well understood, even by the servants of a Fever Hospital, who soon come to know, by these symptoms, that the patient is near 'the cool.' This state sometimes lasted for the greater part of a day, during which time one of our experienced nurses, who was fond of figurative language, would generally remark, that 'the cool was hovering round' the patient."[1] Whatever was the

[1] Dub. Hosp. Rep. vol. ii. p. 17.

form of this "salutary effort," it was generally completed by a warm perspiration flowing from the whole surface of the body. Dr. Cheyne enumerates many other occasional modes of crisis, which seem to have consisted merely in the occurrence of some more or less striking symptom, such as diarrhœa, or expectoration, or a simple chill, just preceding or at the commencement of convalescence, and concludes the subject by saying, that in many instances, he could not discover any critical effort, the disease gradually terminating, as some of the older authors have remarked, by "insensible resolution."

Dr. Stewart, of Glasgow, in reference to this subject, says, "All that I insist upon is the frequent, I may say, the common occurrence of a perceptible crisis, or what is vulgarly termed a turn in typhus. I think I may appeal to the experience of every physician, and more especially of every resident clerk in a fever hospital, for they have more constant opportunities of observation, whether they have not often been struck at seeing, during their morning visit, the glassy eye, the haggard features, the low, muttering delirium, the stupor approaching to coma, the tremor, the subsultus, the carphology, the rapid, thready, tremulous, and intermittent pulse, of the previous evening; the formidable array of symptoms, in short, which seemed to indicate a speedy and fatal termination, exchanged for

[1] Edinburgh Med. and Surg. Journal, Oct. 1840.

the clear eye, the intelligent countenance, the steady hand, the comparatively slow and firm pulse, and the returning appetite of approaching convalescence. To such cases as these we might almost apply the scripture phrase, 'At such an *hour*, the fever left him;' and if the crisis is not *very* frequently so marked, we can, in the great majority of cases, point with precision at least to the *day* on which amendment began to take place."[1]

CHAPTER VII.

MORTALITY AND PROGNOSIS.

The average mortality of typhus fever, deduced from large or considerable numbers, like that of most other epidemics of a grave character, differs very greatly in different seasons and localities. Before proceeding to estimate the elements of our prognosis, in individual cases, I will endeavor to ascertain, as nearly as our materials will allow this to be done, the general rate of mortality in this disease, and some of its variations under different circumstances.

It is estimated by Drs. Barker and Cheyne, in their admirable history of the great Irish epidemic

[1] Edinburgh Med. and Surg. Journal, Oct. 1840.

of 1817, 1818 and 1819, that the number who suffered from typhus fever, in that country, between the commencement of the first mentioned year and the middle of the last, embracing a period of only two and a half years, amounted to fifteen hundred thousand; and that the aggregate number of deaths was sixty-five thousand, making the average mortality, one in twenty-three. The number of patients received into the Cork Street Fever Hospital, of Dublin, between the 14th of May, 1804, and the 5th of January, 1816, embracing no remarkable epidemic period, was twenty thousand two hundred and seventy-eight. The highest mortality was one in ten, in the year 1805; the lowest was one in nearly twenty, in the year 1815; and the average mortality, for the entire period, was about one in fourteen. Dr. O'Brien, in the Report, from which these results are obtained, says, that the hospital necessarily received an undue proportion of grave and dangerous cases; so that the rate of mortality amongst fever patients was somewhat higher in the hospital than in the city at large.[1] The whole number of patients received into the several fever hospitals of Dublin, from the 31st of August, 1817, to the 1st of October, 1819, was forty-one thousand seven hundred and seventy-five; and the deaths, during this period, were one thousand nine hundred and seventy-one; making the rate of mortality one in twenty-two, nearly.[2] The highest rate, for any

[1] Trans. of Phys. of Ireland, vol. i. p. 446, 461.

[2] Ibid. vol. iii. p. 456.

single quarter, was one in fifteen; the lowest for any single quarter, was one in thirty-two. The average mortality, during the same epidemic, in the South Fever Asylum at Cork, was one in twenty-five.

The influence of age, sex, season, and the condition and constitution of the patient, upon the danger of the disease, and upon our consequent prognosis, constitutes an interesting and important subject of inquiry.

Typhus, like typhoid fever, seems to be less severe and fatal in early than in middle life. Dr. Percival says, that amongst the children, who were timely removed from the crowded apartments of the Bedford Asylum, to the cool and ventilated wards of the hospital, and who were properly treated, the fever seldom continued longer than seven days in any case, and hardly ever proved fatal.[1] Dr. Baker observes, that very few children became the victims of the epidemic in the years 1817 and 1818. Amongst the numerous cases of children, which came under his care, he recollects but one, which terminated fatally; and in that instance death was occasioned by the supervention of another disease.[2] Dr. John Cheyne says of the fever of 1818, at the Hardwicke Hospital, that persons under twenty-five years of age had the disease mildly. This influence of age upon the mortality of typhus fever is placed in a very clear and striking light by the

[1] Trans. of Phys. of Ireland, vol. i. p. 288. [2] Ibid, vol. ii. p. 572.

statistical researches of Dr. Mateer. I copy the following table from a paper of his, in the tenth volume of the Dublin Journal of Medical Science, exhibiting the effects of age upon the mortality of the disease, at the Belfast Fever Hospital, from September, 1817, to May, 1835.

Age.	No. of Cases.	Deaths.	Mortality.	
From 1 to 5 years	301	12	1 in $25\frac{1}{12}$	Admitted, 5214; died, 151; being a mortality of nearly 3 per ct or 1 in 34 84-151
" 5 to 10 "	979	13	1 in $75\frac{4}{13}$	
" 10 to 15 "	1709	36	1 in $47\frac{17}{36}$	
" 15 to 20 "	2225	90	1 in $24\frac{65}{90}$	
From 20 to 25 "	1384	74	1 in $24\frac{58}{74}$	Admitted, 3747; died, 301; being a mortality of 8 per cent. and a fraction, or 1 in 12 135-301.
" 25 to 30 "	1033	81	1 in $12\frac{61}{81}$	
" 30 to 35 "	677	70	1 in $9\frac{47}{70}$	
" 35 to 40 "	553	76	1 in $7\frac{21}{76}$	
From 40 to 45 "	418	82	1 in $5\frac{8}{82}$	Admitted, 1043; died, 216; being a mortality of nearly 21 pr. ct. or 1 in 4 179-216.
" 45 to 50 "	302	60	1 in $5\frac{1}{30}$	
" 50 to 55 "	188	45	1 in $4\frac{8}{45}$	
" 55 to 60 "	135	29	1 in $4\frac{19}{29}$	
From 60 to 65 "	86	31	1 in $2\frac{24}{31}$	Admitted, 171; died, 60; being a mortality of 35 15-171 per ct. or 1 in 3 nearly.
" 65 to 70 "	36	12	1 in 3.	
" 70 to 75 "	25	11	1 in $2\frac{3}{25}$	
" 75 to 80 "	24	6	1 in 4.	

Results very similar to the above are shown by an examination of the cases, received into the Royal Infirmary of Dundee, in 1836 and 1837.

It has been very generally observed, amongst the hospital patients in Ireland and Scotland, that the rate of mortality is much influenced by the period of the disease at which the patient is received; it being much less in those cases that are received in

the early than in those that are received in the late stages of the fever. This may depend in part upon the circumstance that the severity of these cases, sent late to the hospital, would be likely to be greater than that of the general average. This influence is very well shown by the following calculation, made by Dr. Mateer, and founded upon a grand total of 9588 patients, treated in the Belfast Fever Hospital during a series of seventeen consecutive years.

Day when admitted.	2nd	3d	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	Total
No. of cases.	541	1081	1669	1101	927	591	1067	302	539	187	247	167	759	9588
No. deaths.	12	41	82	52	39	40	112	30	57	13	25	7	159	664
Ratio of mortality per ct. fract'al Nos. omitted.	2	3	4	4	4	6	11	10	10	6	10	4	20	

It has been observed, as a general rule, in Ireland, that the mortality is considerably greater amongst men than it is amongst women. During certain periods, and in given localities, this difference is very obvious. Thus, at the Cork Street Fever Hospital, Dublin, in 1817, and 1818, the rate of mortality amongst the males was one in sixteen; while amongst the females, it was only one in twenty.[1] During the same epidemic, however, at Cork, the mortality in the South Fever Asylum,

[1] Trans. of Phys. of Ireland, vol. ii. p. 568.

was, amongst males, one in twenty-eight and a half, and amongst females, one in twenty-three.[1] During a period of eighteen consecutive years, from 1818, to 1835, at the Belfast Fever Hospital, the ratio of deaths was, for females, one in fourteen, nearly; and for males, one in seventeen.[2] The rate of mortality in the Royal Infirmary of Dundee, omitting fractions, in 1836, and 1837, was for females, one in eighteen; and for males, one in eleven. It ought, however, to be remembered, in partial explanation of this difference, that, in many places, the average age of the female is less than that of the male patients.

Although the poor are very much more subject to typhus fever than the rich, and those who are well provided with the material comforts and luxuries of life; it is a singular fact, that the disease, when it does occur in the latter class, is more severe and dangerous, than when it occurs in the former. The testimony of the Irish physicians to the truth of this circumstance is almost unanimous. Old Rutty, in speaking of the great epidemic of 1740 and 1741, says: "The poor, abandoned to the use of whey and God's good providence, recovered; while those who had generous cordials and great plenty of sack, perished."

Mental anxiety and distress seem to predispose to a grave form of the disease. The Irish writers have generally observed, that fathers of families and

[1] Trans. of Phys. of Ireland, vol. iii. p. 230.

[2] Dublin Jour. of Med. Science, vol. x. p. 40.

others, whose character and circumstances in life were such as to occasion great depression of spirits and apprehension for the future, were more subject to severe and dangerous attacks than those of a different temperament and in different situations. Dr. Edward Percival remarks, that "fevers which had been preceded by great bodily fatigue and mental anxiety were uniformly hazardous." Dr. Pickels says: "The disease was very fatal amongst the old, and those who were debilitated by previous diseases, especially asthma. Of six or seven blacks who had the fever in Cork, all died but one." Dr. Arrott, of Dundee, thinks, that of all circumstances increasing the danger and mortality of typhus, the previous habitual use of intoxicating drinks is the most powerful.

Our prognosis, in individual cases, must depend upon a careful appreciation of all the foregoing circumstances, and especially upon the degree of severity of a certain number of the symptoms. Great prostration of strength, at an early period of the disease; profound coma; and dark purple or livid petechiæ are amongst the most unfavorable symptoms. Dr. Gerhard says, that in the Philadelphia epidemic, when the stupor was extreme, so as almost to amount to coma, the prognosis was nearly always fatal. Dr. Edward Percival says: "The worst symptoms of fever are pervigilium, tympany, singultus and coma; the most favorable in all cases are sleep, a moist tongue, and solvent bowels; a deficiency of urine is also an unfavorable sign, and

its suppression, very commonly a fatal one. When the patient lies at ease on his side, and especially if he is observed to relieve himself by spontaneous changes of position, after the fever is much advanced, the augury is favorable; on the contrary, when he continues extended and supine, lethargic and muttering, the prognostic is adverse." [1]

Amongst the circumstances to be considered, in the prognosis of individual cases, are the amount and the character of the eruption; the danger of the disease being somewhat in proportion to the abundance and the dark color of the spots. Dr. Henderson found the mortality amongst those with an abundant eruption to be one in five; while amongst those with a scanty eruption, it was one in eight and a half, nearly. Of Dr. Stewart's one hundred and thirty-nine cases, the eruption was universally copious in ninety-six, and the rate of mortality was one in five; it was partially copious in thirty-two, and the rate of mortality was one in six and four-tenths; it was scanty in eleven, amongst whom there was only one death. Of fifty-nine cases, wherein the eruption was light-colored, the deaths were one in twelve, nearly; while of eighty cases wherein it was dark-colored, the deaths were one in four nearly.[2]

Dr. Henderson found, at the Royal Infirmary of Edinburgh, in 1838 and 1839, that *subsultus tendi-*

[1] Trans. of Phys. of Ireland, vol. i. p. 296.
[2] Edin. Med. and Surg Journ. Oct. 1840.

num, to any considerable extent, was almost always followed by death.[1]

Dr. Graves, in a paper published in the Dublin Journal for July, 1838, speaks of contraction of the pupil as a very unfavorable sign in typhus. He says: "In fever with cerebral disease, one of the most alarming symptoms is marked contraction of the pupil, and were I called to a case in which every other symptom was favorable, but great contraction of the pupil was present, I would say, that it was a case of extreme danger. A tendency to even moderate contraction of the pupil is a very dangerous symptom in typhus; but a pupil extremely and permanently contracted, or as it has been called, a *pinhole pupil*, is, or used to be, a fatal sign."

Heat of the skin, according to the observations of Dr. Cheyne, would seem to be rather a favorable indication than otherwise. He found, that amongst two hundred and fifty patients, who were admitted to the Hardwicke Fever Hospital, in the spring and summer of 1817, and in whom the temperature of the skin was ascertained on the day of admission, the rate of mortality was larger in those where the temperature was low than in those where it was high. Amongst eighty-three of these patients, in whom the temperature ranged from 98 deg. to 100 deg. Fah., inclusive, there were seven deaths, or one in twelve, nearly; amongst one hundred and twenty-seven, in whom the temperature

[1] Ed. Med. and Surg. Jour. vol. lii. p. 434, Oct. 1840.

ranged from 101 deg. to 104 deg. Fah., inclusive, there were five deaths, or one in twenty-five; and amongst forty, in whom the temperature ranged from 105 deg. to 109 deg. Fah., inclusive, there was only a single death. "It was not uncommon," says Dr. Cheyne, "to find the thermometer gradually rising from 98 or 99 deg. to 102 or 103 deg., or even higher, while the severity of the disease was abating; and, on the other hand, we frequently observed the temperature declining while the patient was getting worse; thus the patient was often in great danger when the temperature of the body did not exceed 98 deg. In some instances, for a day or two before death, the mercury did not rise above 96 or 95 deg. Indeed, in severe cases, after the temperature fell to par, or below it, and that without any critical effort, we considered its rising again as a favorable change. In examining the disordered state of the vital functions, he adds, during the summer of 1817, with a view to the prognostics of continued fever, we derived more information from the state of the breathing than from the pulse, and more from the pulse than from the temperature of the body."[1]

[1] Dub. Hosp. Reports, vol. ii. p. 13, *et seq.*

CHAPTER VIII.

DIAGNOSIS.

"I cannot conclude this Essay on Fevers, without taking notice of the very great difference there is between the *putrid malignant* and the *slow nervous fever*; the want of which distinction, I am fully persuaded, hath been often productive of no small errors in practice, as they resemble one another in some respects, though very essentially different in others."

JOHN HUXHAM.

Typhus fever may be confounded with various other diseases; with pernicious intermittent or remittent fever, with some cerebral affections, with typhoid pneumonia. The most important point, however, in connection with its diagnosis, is that which refers to its relations to typhoid fever. It may be remembered, that in my observations upon the general diagnosis of the latter disease, I alluded to this subject, and expressed the opinion, that the two affections constituted radically dissimilar fevers; with the further remark, that this question could be best considered, after the natural history of both diseases had been given. We are now prepared to enter upon this particular matter, and to establish, as far as this can be done, the differential diagnosis of the two fevers. There is, however, one preliminary remark, which ought to be made here; and that is, that even if we should come to the conclusion, as a question of strict scientific and philosophical nosology, that these two affections are essentially and fundamentally alike; that they are

forms, merely, of one individual disease; it would still be hardly less important, that we should be able to distinguish between them, *as* forms or varieties of disease. In a practical point of view the necessity of an accurate diagnosis is not removed, even by the conclusion which I have supposed. These forms of fever, if we choose so to consider them, are still so distinctly marked; they differ, in many respects, so constantly and so widely from each other, that their diagnosis is none the less important than it would be under the other supposition, that they are essentially dissimilar diseases. After pointing out their principal points of resemblance and of dissemblance, I will endeavor to exhibit, as fully and as faithfully as I can, the present state of the question in regard to their identity or non-identity, by a reference to the opinions and the investigations of those observers, who have paid especial attention to this subject, constituting, as it does, one of the most interesting and important, which is now occupying the attention of medical men.

In their mode of access typhoid and typhus fevers very nearly resemble each other. Indeed, I do not know, that there is any appreciable difference between them, so far as the slowness or suddenness of the attack is concerned. The seizure of the former disease, in grave cases, is more frequently accompanined with abdominal pain and diarrhœa than is that of the latter.

The chief difference between the two diseases,

in regard to the strictly febrile symptoms, consists in the more pungent and burning heat of the surface, which characterizes typhus. Perhaps it is more frequently the case, also, in this disease than in typhoid fever, that the temperature of the skin falls manifestly below its natural standard as the febrile excitement declines. I am not aware, that there is any thing in the chills, or in the character of the pulse to distinguish the two fevers. Perhaps the latter is more uniformly soft and compressible in typhus than in its related disease.

The odor from the body differs in the two diseases. In typhoid fever, when perceived at all, it is usually in the latter period of grave cases, and is then of a stale, cadaverous character; in typhus it is pungent and ammoniacal, more common and more striking.

The thoracic symptoms are subject to greater variety in typhus than in typhoid fever. In some seasons they are frequent and well marked; in others they are nearly wanting. In the former disease they consist, generally, of dullness on percussion, and feebleness of the respiratory murmur over the lower and back parts of the chest, and of loose mucous rhonchi; in the latter of dry, sonorous or sibilant rhonchi. The cerebral respiration is common to both fevers.

There is a very close correspondence in the number, the severity, and the constancy of the nervous symptoms in the two diseases. Their differences are not enough obvious, or have not been ascertained

with sufficient precision, to render them of much service in this diagnosis. Taking in all grades of severity, they may be somewhat more constant and prominent in typhus than in typhoid fever; the pain in the head may be more intense and distressing; the stupor may be more marked; the morbid sensibility of the surface seems to be more common and striking, and the prostration of muscular strength, on the subsidence of the febrile symptoms, is more invariable and profound.

In the abdominal symptoms of the two diseases there are numerous and important differences. In typhoid fever, where the affection is at all severe, there is generally spontaneous diarrhœa, with liquid, yellowish, ochre-colored stools; in typhus there is commonly constipation, and the stools, when procured by purgatives, are often dark, slimy, or pitchy, and offensive. Hemorrhage from the bowels is not unfrequent in the former; it hardly ever occurs in the latter disease. Abdominal pains are often present in both fevers, but in the former they almost invariably accompany the diarrhœa; in the latter they are attended by constipation, and are relieved by cathartics. In the former they are more frequently confined to the right iliac region, accompanied by tenderness on deep pressure, and gurgling than in the latter. Tympanitic distention of the abdomen is very common in typhoid fever; it is very rare in typhus.

The state and changes of the urine have not been ascertained with sufficient care in the two dis-

eases to enable us to say whether they present any differences in this respect.

The cutaneous eruptions, characteristic respectively of the two affections, are very unlike in many respects. In typhoid fever, the spots are pretty uniformly oval, or circular, varying but little in size; often distinctly though slightly elevated; readily disappearing under pressure; generally not very numerous; confined, for the most part, to the skin of the chest and abdomen; and of a bright rose color. In typhus they are more irregular in their shape and size; not elevated above the adjacent skin; partially disappearing under pressure, or not at all; often abundant, and even confluent; in many cases occupying the skin of the extremities as well as that of the entire trunk; and usually of a duller and more dusky color than in the former disease. Not unfrequently, also, they consist of true petechiæ, or cutaneous ecchymoses, which, in fatal cases, persist after death. The average period of their appearance seems to be rather earlier in typhus than in typhoid fever. The dingy color of the skin, the dusky suffusion of the face, and the dark injection of the conjunctiva, are, to a considerable extent, peculiar to typhus. Such are the principal points of likeness and of unlikeness in the symptoms of these two diseases. I shall now institute a similar comparison between their respective lesions.

There are some differences in the pathological alterations which are found in the thoracic organs, in the two fevers; although they are not very strik-

ing. The lungs seem to be more constantly the seat of some appreciable lesion in typhus than in typhoid fever. Decided engorgement of their posterior portions appears to be more frequent, and an unusual accumulation of frothy mucus in the bronchial tubes. I am not aware, that ulcerative destruction of the epiglottis, more or less extensive, which occurs in a certain proportion of cases of typhoid fever, is ever found in typhus. The state of the heart in the latter disease has not been particularly enough studied to enable us to compare it with that of the same organ in the former; and although there seem to be some differences in the condition of the blood, in the two fevers, the same remark may be made of this fluid.

Venous congestion of the brain, with dark fluid blood, appears to be more common in typhus than in typhoid fever.

The differences in the abdominal lesions, in the two diseases, are very striking and constant. They are so well marked, and so invariable, that they are easily stated. In typhoid fever there is a peculiar and constant alteration of the elliptical patches of the ileum, consisting of various degrees of thickening, changes of consistence and color, and especially of ulceration. In typhus these plates are very rarely altered, and when so at all, only to a very trifling extent. In typhoid fever the isolated follicles, both of the small and the large intestines, are found to have undergone, in many cases, the same changes that occur in the aggregated folli-

cles; in typhus they are in a healthy condition. In the former disease the mesenteric glands, corresponding to the altered and ulcerated follicles, are reddened, softened and augmented in volume; in the latter they are unchanged in any respect. The large intestines are usually more or less distended with flatus in typhoid fever; they are not so in typhus. The spleen is enlarged and softened in a considerable proportion of cases of both diseases; but these changes are greater and more frequent in the former than in the latter. Alterations in the thickness, color, consistence, and so on, of the mucous membrane of the stomach and intestines, are frequent, but not invariable in both affections; there is nothing of any diagnostic value in their differences.

In connection now with the causes of these fevers there are several circumstances in which they differ very considerably from each other. Typhus, although occurring most frequently in early life, is not so exclusively confined to this period as typhoid fever is. The former attacks individuals more than forty years old much oftener than the latter does. Recency of residence in any given place, although it seems to favor the occurrence of typhus, does so much less powerfully and manifestly than of typhoid fever. The unknown causes of the latter disease, connected with locality, are less circumscribed, geographically, than those of the former; at any rate they seem to be more constantly and uniformly present over more extensive regions of the earth.

In other words, typhoid fever is widely and continually prevalent in many places where typhus is very rarely if ever seen. The sporadic character of the former is more marked and evident than that of the latter. Typhus prevails more frequently, in an epidemic form than typhoid fever. The latter disease may be, to a certain extent, and under certain circumstances, contagious; but it is much less evidently and decidedly so than the former. The connection of crowded, filthy, and poorly ventilated apartments with the origin and propagation of typhus, is more manifest and unequivocal than with those of typhoid fever.

The average duration of typhus is considerably less than that of typhoid fever; and death from the former disease occurs, in many cases, earlier than from the latter. The termination of the disease by a more or less well marked crisis would also seem to be much more common in the former than in the latter.

Finally, it is very evident, I think, that these two diseases differ from each other in the effects which are produced upon them by remedies. The immediate influence, for instance, of treatment, is much more obvious in typhus than it is in typhoid fever. General or local bleeding, when it is indicated, is more uniformly followed by mitigation or removal of local pain, especially of that of the head. So the administration of stimulants and tonics, under circumstances that call for them, is more frequently followed by a strong and manifest impression upon

the morbid actions than is often seen in typhoid fever. It is pretty clear, also, that as a general rule, typhus requires a more tonic and supporting treatment than the latter disease. M. Bouillaud may have failed to show, that typhoid fever is more successfully treated by repeated bleedings, general and local, even at periods of the disease somewhat advanced, and independent of any special local indication, than by any other plan; but he has at least demonstrated, that this treatment may be borne with a good degree of impunity. We rarely hear of the sudden and often fatal sinkings and collapses, which have so frequently followed a single moderate abstraction of blood, in the middle and later stages of typhus.

Amongst the diseases, with which typhus fever may be easily confounded, may be mentioned *pneumonia typhodes*. The two affections have many things in common. In true typhus there is often much pneumo-bronchitic congestion, or inflammation. In bastard peripneumony there is much of the typhoidal, or congestive state of the system. It is not possible, however, in the present state of our knowledge, to point out with any particularity, or in detail, the differential diagnosis of the two diseases. There are no full histories of pneumonia typhodes. The accounts of the disease, as it prevailed in various parts of the Northern and Middle States, between 1812 and 1815, are mere sketches; so loose and general as to be of very little value in this respect. The more sudden access of the dis-

ease; the greater preponderance of local, thoracic symptoms; the less marked and less early disturbance of the cerebro-spinal system; and the absence of the eruption, would, in most cases, probably, enable us to distinguish the pneumonia from typhus.

I may remark here, that it is very important for us to bear in mind, that great difficulties of diagnosis, in individual cases, are in no way incompatible with the existence of essentially and widely different diseases. Morbid affections, very unlike each other, and in most cases, easily distinguishable, may, under certain circumstances, have many things in common; and their symptoms may be so mixed up with each other as to render, in the imperfect state of our knowledge, a positive diagnosis very difficult, or impossible; and this without throwing any doubt upon the general question of the radical dissimilarity between the diseases themselves.

If this alleged and well-defined difference between typhoid and typhus fevers really exists; if these two diseases are radically and fundamentally diverse, and unlike each other; and if the diagnosis between them can be generally established, it becomes a matter, not only of scientific interest, but of great practical moment, for us to enquire how far this distinction is recognized, either in form or in fact, by the leading and classical British writers, who have long been and who still continue to be, to a very great extent, at any rate, our guides and authority on the subject of one at least of these diseases. What do they mean by the terms typhus

fever, common continued fever, slow nervous fever, and so on? Do they describe a single disease, essentially identical in its nature, and differing only in its form, under these several appellations? If so, what is this disease? Is it typhus fever, or is it typhoid fever? On the other hand, do they describe distinct and separate diseases, under these several appellations? If so, what are these diseases? Are they typhoid and typhus fevers, or are they something else? Certainly, I need not say how necessary it is to all sound science and to all successful or even safe practice, that we should understand each other upon this primary and fundamental point of diagnosis. Certainly, I need not say what contradictions and what inextricable confusion must inevitably grow out of the want of this understanding. In order to determine, as far as may be, the questions above indicated, I will briefly examine the opinions and observations of some of those British authors, whose works are most generally in the hands of our own practitioners, and whose writings have most extensively influenced their doctrines and their practice. Amongst these, I may mention, particularly, John Armstrong, Southwood Smith, and Alexander Tweedie.

In Dr. Armstrong's "Practical Illustrations," there is a great deal of gratuitous generalization, and of loose diagnosis; but he nevertheless admits, very distinctly, the existence of two distinct forms of fever. One of these he calls typhus fever; and the other, common continued fever. He uses the

term typhus, he says, not, as has often been the case, to designate the combination of malignant symptoms, which may take place in the last stage of any acute disease, but "to denote a specific disease, that, like the epic poem of ancient critics, has a beginning, a middle, and an end." The common continued fever of Dr. Armstrong is, I think, the typhoid fever of Paris and of New England. The leading and prominent distinctions between the two diseases, already so fully pointed out in the foregoing pages, can hardly fail of being recognized in the following extract: "The disturbance of the sensorial functions and the prostration of the moving powers are remarkably characteristic of true typhus. In the most frequent forms of the common continued fever, the patient has uneasiness in the head, but he has a bright eye, and a countenance indicative of no mental depression or despondency, and he lies in a position which displays some command of muscles, and can move about the bed or get up with a tolerable effort. On the contrary, in genuine typhus, the eye always wants animation, the countenance has a dull, wearied, depressed, and often desponding expression, and the patient lies in a comparatively relaxed position, and moves himself more languidly, almost like one worn out by loss of sleep, and from some unusual fatigue. In the common continued fever, the patient commonly has not much inaptitude of mind, often answers questions readily, and in a pretty firm voice, without much increased agitation of the

breathing; whereas in typhus the answers are mostly given with languid slowness and reluctance, and much speaking obviously disturbs the respiration. In the common continued fever, the skin is generally of a brighter red than natural, especially on the cheeks; on the contrary, the skin is always more or less of a dusky color in typhus, and an admixture of it may be best observed in the flush of the face. This duskiness of the skin is one of the proper symptoms of typhus, and seems to arise from some change in the constitution of the blood, which I have almost invariably seen darker than in ordinary fevers. In the worst cases, the duskiness increases in the progress of the disease, and lessens in those that assume a mild aspect. So very characteristic is this cutaneous duskiness, that I think I could distinguish typhus by it, at any time, if two patients were presented to me, the one laboring under that disease, and the other under the common continued fever. In typhus, the tongue has an early tendency to become brown and dry, in the common continued fever it is always white, and often even somewhat moist for the first week; in typhus, the pulse is variable as to force and frequency, but it is seldom very resisting to pressure, but in the common continued fever it mostly resists firm pressure of the finger, from the freer stroke of the heart. The above remarks are certainly most appropriate to the first and middle stages of the ordinary instances of typhus, and of the common continued fever; for, in the last stage of both,

many of the symptoms so approximate as to make them more nearly resemble each other."[1] Dr. Armstrong also speaks of the peculiar odor from the body in typhus fever, of the appearance of petechiæ, and of the frequency and gravity of pulmonic complications. Amongst the occasional symptoms of the common continued fever, he mentions epistaxis and diarrhœa; and in most cases, he says, death occurs at the end of the second or middle of the third week, but sometimes later. Now when it is remembered, that the diagnosis between this common continued fever of Dr. Armstrong, and many local inflammations, was but very imperfectly established, when his book was written; that its characteristic features had been but partially ascertained; that other diseases must necessarily often have been confounded with it, we shall have no difficulty, I think, in coming to the conclusion, that, with these qualifications, the disease described by Dr. Armstrong as the common continued fever, is identical with the typhoid fever of the present day, and that his typhus fever is *the* typhus of the present day.

Dr. Armstrong thinks, that there is a third form of fever, occasioned by the crowding together of a great number of persons in filthy and close apartments, differing from both the preceding fevers. His notice of it is too short and imperfect to enable one to judge of the correctness of this opinion; but

[1] A Treatise on Fever. By Southwood Smith, M. D., Boston, 1831; p. 41.

the disease, which he describes, was, probably, a form of typhus.

Dr. Southwood Smith denies the existence of more than one continued fever. To the several forms and varieties of this single fever, depending upon degrees of severity and complications, he applies different terms, merely, however, as a matter of convenience. "The more we investigate the subject," he says, "the more satisfied we shall become, that continued fever is one disease and only one, however varied or even opposite the aspect it may present; but that it differs in intensity, in every different case, and that this, and this alone, is the cause of the different forms it assumes."[1]

Notwithstanding this opinion of Dr. Smith, an attentive study of his book, with our present knowledge upon this subject, will lead us, I think, to the conclusion, that the two diseases, which I have described, the typhus and the typhoid fever, both fell under his observation, and both helped to furnish the materials for his work; although he failed, as his predecessors and contemporaries had done, to discover and to distinguish, clearly, the differences between them. It must, however, be added, that his histories of the several varieties of fever are not sufficiently full and accurate to enable us, always, to make a satisfactory diagnosis. His descriptions are glowing and vivid enough, too much so perhaps, but they are not diagnostic, they are not discrimi-

[1] Practical Illustrations of Typhus Fever, etc. By John Armstrong, p. 234, *et seq.*

nating; they are not complete. Like those of almost all English writers upon fever, they are not pure; they are mixed up and corrupted with *à priori* and hypothetical explanations and interpretations of the symptoms.

His *synochus mitior* seems to be a mild form of typhus, although it is impossible to speak with any confidence, from his description. The same remarks may be made, excepting as to the severity of the disease, of his *synochus gravior* with sub-acute and with acute cerebral affection, and with thoracic affection. His *synochus gravior* with abdominal affection corresponds more nearly to typhoid fever. Some of the cases, included in this sub-division, certainly belong to the latter disease. His several varieties of typhus, corresponding to those of synochus, and excepting that with abdominal affection, are, pretty evidently, for the most part, made up of cases of true typhus. His *typhus mitior*, with abdominal affection, looks more like typhoid fever.

Now, taking the evidence derived from the symptomatology alone, in these descriptions by Dr. Smith of his several forms and modifications of continued fever, one thing, at least, we may look upon as settled. If, on account of the incompleteness and vagueness of Dr. Smith's general and particular histories of the disease, we are not justified in deciding positively, that the two distinct fevers, as I have described them, were both present in the London Fever Hospital, we may with entire confidence assert, that these histories contain no evidence,

whatever, that such was not the case. So far as the evidence derived from this source goes at all to settle the question, aided and interpreted, as it now is, by our present knowledge, it goes to show, that both typhoid and typhus fever, but principally the latter, constituted the disease which Dr. Smith describes; and this conclusion we shall find singularly corroborated by an examination of his cases illustrative of the pathology of the disease.

His general description of the lesions found after death is too loose and imperfect to be much relied upon. He speaks of the dusky color of the skin, the large, purple petechiæ, and the dark color of the muscles and the internal viscera. The brain is described as usually morbid; either increased vascularity of its membranes and substance, or serous effusion constituting the most common alteration. We may, however, well feel the necessity of caution and skepticism, when we find it stated, as it is, that "the pituitary gland is very constantly softened, and often in a state of suppuration." The mucous membrane of the bronchial tubes was very generally thickened, and of a dark red color. The lower portion of the small intestine is said to have been found, in many cases, more or less extensively diseased; its mucous membrane sometimes only reddened and vascular, and at others the seat of ulcerations. These ulcerations, with alterations in the mesenteric glands, seem to have been identical with the entero-mesenteric lesion, which I have described as characteristic of typhoid fever. In a

large number of cases, on the other hand, the intestine is said to have been free from disease. Now, the point to which I wish more particularly to refer, illustrative of the question before us, is this; the average age of the patients constituting the two classes of cases; those which did, and those which did not exhibit, after death, the peculiar lesion of the elliptical plates, found in typhoid fever. I find, for instance, that there are thirty-five cases, reported, of fever with prominent cerebral affection, and with absence of intestinal ulceration; and that the average age of these cases is thirty-four years. Of these patients, there were thirteen, who were over thirty-five years of age; ten of them were as high as fifty, and the oldest was sixty-five. There are eight cases, reported, of fever with prominent thoracic affection, and with no ulceration of the intestine. The average age of these cases is somewhat more than thirty-six years. There are three cases, reported, of fever with prominent abdominal symptoms; but without ulceration of the ileum; and the average age of these is forty-five years. There are eight cases, reported, of mixed disease, without ulceration, the average age of which is twenty-two years and a half. The average age of these fifty-four cases is about thirty-three years. I find, furthermore, forty cases, reported, wherein the intestinal ulcerations characteristic of typhoid fever were present; and the average age of these cases is twenty-two years and a third. Only four of them were over thirty-five, and the oldest was fifty years of age.

The bearing of this result upon the question of the existence of typhus and typhoid fevers amongst Dr. Smith's cases, and of the diagnosis between them, is too obvious to require any further remark.

Dr. Alexander Tweedie's *Clinical Illustrations of Fever* were published in 1830. This work is more fragmentary in its character, and less systematic than the treatise of Dr. Smith; but it bears many marks of sound judgment and careful observation. Dr. Tweedie seems to be very strongly impressed with the fact, that different and diverse fevers prevail in London; but he has failed to point out with any degree of accuracy or completeness their distinguishing characteristics. His work, like that of Dr. Smith, is thus rendered almost valueless by the fatal and fundamental defect of a want of all clear and well-defined diagnosis. This is true in relation not only to the separate kinds of fever, but also to other and widely different diseases. Thus, under the head of continued fever, we find many cases, which are, manifestly, not fevers of any kind. These are instances of peritonitis, pneumonia, phthisis, and so on. Under these circumstances, and from such imperfect data, it would be worse than idle to attempt to settle the important question of the kind and character of the fever, or the fevers, which are described by Dr. Tweedie. I wish merely to remark, that an examination of his cases, in reference to their average age, furnishes the same singular corroboration of the correctness of the opinion, which I have given, in re-

gard to the existence amongst them of both typhoid and typhus fever, as has already been deduced from a similar examination of those of Dr. Smith. For instance, of fifteen cases, which, as far as I can judge, seem to have been cases of fever, and in which there was no intestinal ulceration, the average age was about forty years; while the average age of sixteen other cases, in which the lesion, characteristic of typhoid fever, seems to have been present, the average age was less than twenty-six years.

By some of the older British physicians, however, amongst whom may be mentioned, especially, the incomparable Huxham, the difference between these two forms of fever was distinctly noticed. I have already given an extract from this writer's Essay on the *Difference between a Slow Nervous and a Putrid Malignant Fever;* in which, considering the time when it was written, and the comparatively imperfect study of diagnosis, which was then common, the peculiar features of the two diseases are very well delineated.

Twenty years ago an interesting paper was published in the Edinburgh Medical and Surgical Journal, by Dr. Autenrieth, Jr., on the *Sporadic Abdominal Typhus of Young People*, as the disease showed itself in the south of Germany. The difference between it and the typhus is distinctly recognized; although, as the author remarks, the two diseases had generally been confounded. Dr. Autenrieth, Jr., says expressly, and in so many words,

that the disease, which constitutes the subject of his essay, is essentially distinguished from typhus; by arising independently of any contagion; by the particular time of life in which it spontaneously occurs; and by the seat of the complaint being in the abdomen rather than the brain. Amongst the symptoms, which the author enumerates, and which show very clearly its identity with typhoid fever, and its difference from typhus, are watery diarrhœa, abdominal pains, tympanites, and epistaxis. Dr. Autenrieth's sketch of the disease was written from memory, while he was residing in Edinburgh, and at the close of his paper he refers to a more exact and comprehensive description of the disease, to be expected from the hand of his father. "If," he says in conclusion, "by the present attempt, I should be so happy as to excite the attention of the British medical profession to the knowledge and cure of this disease, I entertain the hope, that in a short time the science may be enlarged, and my design completely attained." It is not a little remarkable, that the attention of British observers should have been especially called to this particular subject, the distinctions between these two forms of fever, fourteen and sixteen years subsequent to the publication of Dr. Autenrieth, Jr.'s, paper, by two other young continental physicians, Dr. Lombard, of Geneva, in 1836; and Dr. Staberoh, of Berlin, in 1838.

I shall now give a summary of the investigations which have been made, and of the opinions which

have been advanced, in regard to this very important question, during the last few years.

Dr. E. Hale, Jr., of Boston, in a paper on the Typhoid Fever of New England, published in the Medical Magazine for December, 1833, speaks very decidedly of the want of correspondence between the descriptions of typhus, given by Dr. Armstrong and Dr. Southwood Smith, and the phenomena presented by the common fever of our own country. These phenomena, he says, are "widely different" from those enumerated by the foregoing writers as characteristic of the typhus which they describe; but whether this want of likeness depends upon various modifying circumstances, connected with the prevalence of the disease in the two countries, or upon an "intrinsic difference" in their nature, he does not stop to inquire.

The Dublin Journal of Medical Science, for September, 1836, contains two short letters, written by Dr. H. C. Lombard, of Geneva, and addressed to Dr. Graves, on the relation of the typhus fever of Britain to the typhoid fever of the continent. Dr. Lombard had for six years been familiar with the latter disease in France and in Switzerland, and in the fatal cases, had invariably found the peculiar lesion of Peyer's glands. On Dr. Lombard's arrival in Glasgow, in 1836, he was allowed by his friends to examine the body of a fever patient, in whom he had said no doubt could exist as to the presence of follicular disease. He was not a little

astonished at finding the elliptical plates wholly unaltered. On his arrival in Dublin, he was again furnished with an opportunity of making two similar examinations; one at the Meath, and one at the Hardwicke Hospital; and here again he was disappointed in not finding any lesion of the elliptical plates. Dr. Lombard alleges that he found the symptoms of the British typhus almost identical with those of the typhoid fever of the continent, but he immediately proceeds to mention the great difference in the appearance of the eruption in the two diseases, or forms of disease, the frequent occurrence of typhus in old subjects, the absence of prominent abdominal symptoms, and its strongly marked contagious character. He does not speak very positively upon the subject, but is unwilling to admit that the two diseases are specifically distinct.

Dr. Lombard, on his way home, visited the Fever Hospitals of Liverpool, Manchester, Birmingham, and London; and on his arrival in Geneva, wrote a second letter to Dr. Graves, bearing date about one month subsequent to his first communication. At Liverpool, Manchester, and London, he found the same state of things as he had seen in Dublin, and Glasgow; prominent cerebral symptoms, an abundant cutaneous eruption, infrequency of abdominal disorder, many patients of advanced age, and strong evidences of the contagious character of the fever. It does not appear, that he witnessed any

autopsies any where in England. At Liverpool he was told, that ulcerations of the ileum and cœcum were occasionally, but by no means constantly, met with; and that their frequency varied in different seasons. At Manchester he was informed merely, that the ulcerations of the intestines were by no means always to be found in the fatal cases: at Birmingham he saw no patients, but was told by the medical attendants of the fever wards in the General Infirmary, that in examinations, after death, ulcerations of the lower part of the ileum were always present. At the London Fever Hospital he saw but very few patients, but concludes from Dr. Tweedie's researches, that ulcerations in the lower part of the ileum are not to be found in more than one-fourth of the fatal cases; and that their frequency varies with different seasons; it being much greater in autumn than at any other period of the year.

This constitutes the whole sum and substance of Dr. Lombard's personal knowledge of the typhus fever of Great Britain. In his second letter he expresses, very decidedly, the opinion, that there are two distinct and separate fevers prevalent in Great Britain; one of them identical with the *contagious typhus, the army and jail fever* of the French pathologists; the other a sporadic disease, identical with the typhoid fever, or dothinenteritis of the French. He considers Ireland as the source of the former disease; and supposes it to be carried by the Irish, in their annual migrations, to the several large

towns and cities of the sister island.[1] In Glasgow, it constitutes, he says, one-third of the total number of fever cases; in Dublin much less; and in London one fourth; these proportions varying in different seasons, but being greatest in autumn.

Many of the suggestions contained in these letters, were, at the time when they were made, exceedingly important; and it seems somewhat singular, that they should not immediately have received a greater degree of attention from British observers. The conclusions, however, in regard to the exact degree of proportion in the prevalence of the two fevers, or forms of fever, in different cities of Great Britain, and in regard to the exclusive origin of typhus in Ireland, and its subsequent diffusion through Scotland and England, are, to say the least of them, premature and gratuitous. This precipitancy of judgment would seem to be a prominent characteristic of Dr. Lombard's mind; for we find him, in 1839, imagining that he had demonstrated the existence of a new disease; a true bilious fever, differing both from typhoid and from the bilious remittent fever; from this worthless and utterly inadequate evidence; the occurrence of two cases of prolonged bilious vomiting and purging, one of them in a female, seventy-four years old,

[1] As an offset to this opinion it may be remarked, that Dr. Barker, many years ago, attributed the great increase in the prevalence of fever, which took place throughout Ireland, during and after the year 1810, to its introduction from the continent by the return of the Walcheren troops, and in other ways.

the other in a female fifty-eight years old; both terminating fatally; in only one of which was there an examination of the body, and in this no apparent lesion of any of the organs![1]

The most important document, in the history of this investigation, is the paper of Dr. Gerhard's, to which reference has been so frequently made. The leading facts contained in that paper, so far as they bear upon the question before us, have already been embodied in the preceding account; it can be hardly necessary, therefore, to repeat them here. It is enough to say, that the disease observed by Dr. Gerhard and Dr. Pennock, prevailed somewhat extensively, there having been admitted to the hospital with it, between March and August, 1836, nearly two hundred and fifty patients; that it corresponded, very exactly, in its symptoms, to the true typhus; that it was clearly transmissible by contagion; and that the elliptical plates, and the mesenteric glands were found uniformly free from the lesion of typhoid fever. Dr. Gerhard and Dr. Pennock had both been familiar with the latter disease, and they were struck with the wide difference between it and the typhus of 1836; and to them belongs the credit of having first fully pointed out, and clearly established, the most prominent and essential points of dissemblance between the two diseases.

Dr. Staberoh, of Berlin, after four or five years study of continued fever in Vienna and Paris, and

[1] Gazette Médicale, March, 1839.

after passing six months in Great Britain, where he had extensive opportunities for observing both typhus and typhoid fever, adopted the doctrine of the specific difference between the two diseases.[1]

Mr. Henry Kennedy, in a paper contained in the Dublin Journal for March, 1838, says, that while his mind was in a state of suspense in regard to the conflicting opinions of the French and British pathologists as to the connexion between intestinal lesions and continued fever, an opportunity was presented to him of seeing the common fever of Paris and of Geneva; and to his surprise he found it in many particulars different from the typhus of his own country. Two years of subsequent uninterrupted study of the subject convinced him, "that the fevers of the two countries are of different types, and that typhus may in the great majority of instances, be distinguished from the gastro-enteric fever of the French."

In the early part of 1839, Dr. George C. Shattuck, Jr., of Boston, had an opportunity of studying, under favorable circumstances, a small number of cases of continued fever in England. Dr. Shattuck had been already familiar with the typhoid fever of Paris, where he had then recently been engaged in its investigation, under Louis. It was at the particular request of Louis, as well as from his own warm interest in this very important question of diagnosis, that his observations were made. He

[1] Dublin Jour. of Med. Science, July, 1838.

saw thirteen cases of continued fever, at the London Fever Hospital, where, he says, through the kindness of Dr. Tweedie, the attending physician, and of Mr. Goodfellow, the resident medical officer, every facility for the examination of the patients, and for anatomical researches, was afforded him. An account of these cases was communicated, by Dr. Shattuck, to the Medical Society of Observation of Paris. They were subsequently made the groundwork of an elaborate memoir of nearly seventy pages, by M. Valleix, which is contained in the October and November numbers of the *Archives Générales de Médecine*, of Paris, for 1839. Dr. Shattuck's own history of his observations was published in the Medical Examiner for February 29th, and March 7th, 1840. As M. Valleix's analysis and comparison are founded entirely upon the cases furnished by Dr. Shattuck, it is unnecessary to take any further notice of the former, excepting to say, that the author arrives at the conclusion, that the typhoid and typhus fevers are both to be met with in England, and that they are distinct diseases.

Dr. Shattuck's paper contains histories, more or less complete and extensive, of six of the thirteen cases. The first of these was, clearly enough, identical with the typhoid fever of Paris and New England. The patient was twenty-two years old; and in addition to many symptoms common to both diseases, there were meteorism and diarrhœa; and on examination, after death, the characteristic lesion of the elliptical plates, and the mesenteric glands,

although moderate in extent, was present. Nothing is said, in the report of this case, of any cutaneous eruption. The second case corresponded, in its most prominent features, to the typhus fever of the Irish writers, and of Dr. Gerhard. There was no meteorism, and the skin of the trunk and limbs was covered with numerous spots of a dark red color, imperfectly disappearing on pressure, of the size of the head of a pin or of a small pea, grouped together. The elliptical plates and the mesenteric glands were in a healthy condition. In the third case the disease does not seem to have been so clearly marked. The symptomatology was rather that of typhoid than of typhus fever, but along with four or five lenticular rose spots on the abdomen, slightly raised above the surface of the skin, and disappearing on pressure, there were other spots grouped together, not raised above the surface. The history of the case is not very full. The fourth case was, evidently enough, I think, one of typhus fever. The abdominal symptoms were very slightly marked, there were redness and suffusion of the eyes, and the deep red, grouped eruption over the skin of the body and arms. In the fifth case, which is briefly described, the diagnosis is uncertain. There were no abdominal symptoms, and both eruptions seem to have been present, as in the third case. The sixth and last case is reported more at length. It resulted fatally, and after six days of mild and damp weather, the abdominal viscera were removed from the body and examined. There was no appreciable alteration of

the elliptical plates or the mesenteric glands. Dr. Shattuck seems disposed to consider this case as one of typhoid fever. There was diarrhœa, and the abdomen was somewhat swollen. It was tender on pressure, but so also were the limbs. There were a few lenticular rose spots upon the abdomen, but they were followed by an abundant petechial eruption, of a deep red color, scarcely disappearing on pressure, not raised above the skin, and extending over the body and limbs. It ought to be added, that this patient, who, up to that period, had been in good health, was seized with the disease, the day after she had been employed in washing the clothes of the porter of the hospital, who had just died of fever.

It is not my purpose to follow out in detail Dr. Shattuck's analysis and comparison of the phenomena presented in his cases. Throwing out one of the cases, he divides the remaining twelve into two series, the first corresponding in its general features to typhoid fever, and the second distinguished from the first by the absence of abdominal symptoms, of the lesions of the glands of Peyer, by presence of a peculiar eruption, and by the liability to the disease on the part of older persons. The first series consists of three cases, one of which terminated fatally; the second consists of nine cases, four of which were fatal.

These observations, although few in number, are very valuable. They were made under interesting circumstances, by a competent and accomplished

observer; and they show, conclusively, so far as they go, that many cases at least, of the continued fever of Britain, may readily be distinguished, during life, from the typhoid fever of France and our own country; and that they are not characterized by the same anatomical lesion which is present in the latter.

The forty-fifth volume of the Edinburgh Medical and Surgical Journal contains some observations on Continued Fever, as it occurs in the city of Glasgow hospitals; in the form of a letter to the editors, by Dr. Robert Perry. The only thing in these observations, which it is at all important for me to notice, is the view which Dr. Perry takes of the relations between dothinenteritis and typhus fever. He looks upon the intestinal lesion as an accidental complication of typhus fever, and not less frequently, also, of small-pox; and says, that in the latter disease, the morbid appearances in the intestine are the same as those which occur in dothinenteritis itself, which disease, he says, may also exist as an affection *per se*, characterized by its peculiar symptoms; and from his enumeration of these symptoms, it is very certain, that he has reference to typhoid fever. It is quite clear that Dr. Perry's observations, notwithstanding their extent, and he speaks of having made three hundred autopsies, have not been sufficiently accurate and discriminating to aid us much in the settlement of nice and difficult questions of diagnosis, like the one under consideration.

In the month of April, 1840, Dr. Alexander P. Stewart read, before the Parisian Medical Society, a valuable paper upon the question of the identity or non-identity of typhoid and typhus fevers. This paper is contained in the Edinburgh Medical and Surgical Journal for October, 1840. Dr. Stewart says, that when he began, in 1836, the practical study of fever, he was much struck with the simultaneous occurrence, in the wards of the Glasgow Fever Hospital, of two sets of cases, in which the symptoms, however little most of them might seem to differ, when viewed individually, presented, when taken collectively, characters so marked as to defy misconception, and to enable the observer to form, with the utmost precision, the diagnosis of the nature of the disease, and the lesions to be revealed by dissection. In one class of cases, the affection, when it was mild in its character, and of short duration, was not attended by any eruption; while those cases, in which it was fatal, presented an abundant and generally a profuse eruption; but in the other class of cases, which equally, and even in a much higher proportion, went on to a fatal termination, there was rarely any, and, at most, only a very scanty eruption. Dr. Stewart also noticed, that the disease, in the latter class of cases, was much more gradual in its progress, and prolonged in its duration than in the former; and, finally, to complete the contrast, already so striking, dissection proved the existence, in the one disease, of most extensive local lesions, and in the other,

the absence of all prominent local lesions whatsoever. Dr. Stewart then proceeds to consider, at some length, the leading features of difference between these two diseases, in regard to their origin, their proximate causes, their course and duration, some of their symptoms, some of their anatomical lesions, and their treatment. He considers it settled, that the poison of typhus is frequently generated by the crowding together of great numbers of individuals in close and unventilated places, while the similar origin of typhoid fever is, at least, very doubtful; that typhus is eminently contagious, while typhoid fever is so to a much more limited extent, and only under peculiar circumstances; that the mean duration of typhus is much less than that of typhoid fever; that relapses are as common in the latter as they are rare in the former; that well marked crises occur frequently in typhus, but never in typhoid fever; that the symptoms connected with the abdomen, and that the cutaneous eruption are very dissimilar in the two diseases; that there is no resemblance between the anatomical lesions; and that the treatment which may be best adapted to one disease, may be most unsuited to the other.

Dr. Stewart had studied typhus fever in Glasgow, and typhoid fever both in Glasgow and Paris, before the publication of his very interesting and instructive paper; and many of his conclusions are founded upon his own careful observations of the two diseases. I cannot help remarking, that it is somewhat singular, that amongst the many observ-

ers whom he quotes in support of the views, which it is the object of his paper to establish, and to illustrate, he should have wholly overlooked the researches of our countryman, Dr. Gerhard, who, by his history of the epidemic typhus of Philadelphia, in 1836, had done more than any other observer towards determining the very questions, which constitute the subject of Dr. Stewart's essay.

It is proper, that I should notice here, very briefly, some remarks upon this subject, appended to an elaborate prize essay, on the sources and mode of propagation of the continued fevers of Great Britain and Ireland, by Dr. William Davidson, of Glasgow. Dr. Davidson institutes a loose general comparison of the symptoms of the two fevers, and pronounces them nearly or quite identical. He gets over the difference in regard to diarrhœa by attributing its frequency in the typhoid fever of Paris to the neglect of the French to use purgatives, and to the consequent irritation of the intestinal mucous surface by the retained feces. The seeming difference in relation to the comparative frequency of meteorism in the two diseases, he explains by supposing that the French apply this term to much slighter distentions of the abdomen, than would justify the English in its use. He quotes Dr. Lombard to show, that the symptoms of the two fevers are the same. Dr. Lombard's *opinions* upon this subject may be very sound; but we have already seen, that his *observations*, so far as the

symptoms of the diseases are concerned, were too few and too hurried to be of any value whatever. Dr. Davidson admits, that the intestinal lesion is very rare on his side of the channel, and almost invariable on the other; but this circumstance he seems to suppose may be accounted for by differences of climate, diet, habits, &c. So far as Dr. Gerhard's researches are concerned, in relation particularly to the lesions, he begs the question entirely, by implying, that the disease which he describes, could hardly have been British typhus, since fifty consecutive inspections of that disease could not be made without finding one decided instance of alterations in the intestinal follicles. He also misunderstands Dr. Gerhard, in representing him as resting his diagnosis of typhus almost exclusively on the absence of the lesion, and as admitting the almost perfect identity of the symptoms of the two diseases, neither of which does Dr. Gerhard do. In conclusion, he admits that "the strength of his argument" in favor of the identity of the two fevers lies in the fact that it has been admitted, that cases of typhoid fever have occurred with no intestinal lesion. After the full exposition, which has been given, of this particular point, and the extreme infrequency, which has been shown, of the occurrence itself, it is obvious though, that the argument deduced from it is characterized by any thing rather than *strength*.

In an inquiry into the sources and mode of action of the poison of fever, by Dr. Alfred Hudson, phy-

sician to the Navan Fever Hospital, republished in this country, in connexion with the above mentioned Essay, in Dr. Dunglison's Medical Library, the author takes the opposite view of this subject. He recognizes the essential dissimilarity of typhus and typhoid fevers; and gives the valuable results of his own personal observations in the following words: — "In the Navan Fever Hospital there have been for the last seven years almost always two distinct forms of fever present; one or the other occasionally preponderating, so as at times nearly to exclude the other. Thus for the first three years the prominent features were pain, tenderness, and meteorism of the abdomen, diarrhœa, and not unfrequently these symptoms combined with catarrh; several cases of perforation of the ileum occurred towards the close of this period; petechiæ were not frequent, and were late in their appearance, and we had few instances of communication by contagion. During the three following years a highly contagious fever prevailed, and the symptoms and treatment were completely different; delirium, subsultus, dysphagia, being the ordinary symptoms, and diarrhœa being rarely met with; nearly every case presented the measly efflorescence, and instances of contagion were as numerous as they had been rare previously. During the present summer the prevailing type has been the abdominal fever of the first period, and instances of typhus are infrequent, certainly not a fourth of the whole, and sent exclusively from a district in which the epidemic of last year still lingers."

Many of the French writers upon typhoid fever, of the present period, seem to incline to the opinion, that the camp and jail fever of former observers, and the typhus of the British authors, is identical with that of their own country. In 1837, the Royal Academy of Medicine crowned with one of its prizes a memoir, by M. Gaultier de Claubry, upon the differences and analogies between typhoid and typhus fevers; the conclusion of which memoir is in these words: —"There are no means of distinguishing typhus from typhoid fever, in relation either to the lesions or the symptoms of the two diseases." The same writer, as late as October, 1839, says, that the identity of the two diseases is henceforth put beyond doubt.

In the *Archives Generales de Medecine* for January and February of the present year, 1842, there is an interesting history of a supposed epidemic typhus fever, which prevailed at Rheims, between the first of October, 1839, and April, 1840; by M. H. Landouzy; in the course of which, the author considers, at some length, this question of the differences and resemblances between typhus and typhoid fevers. The epidemic was confined to the inmates of a certain quarter of the prison of Rheims, and to those whose occupations brought them into close connection with the patients after they were removed from the prison to the hospital, where they were all immediately and successively taken on the appearance of the fever. The entire number of cases was one hundred and thirty-eight; one

hundred and three of which were amongst the inmates of the prison; the remaining thirty-five consisting of physicians, medical students, nurses and others, connected with the hospital where the patients were treated.

There are some circumstances, which render the history of this particular epidemic one of great value. I will mention only one, and that is, that all the cases came under the observation of the medical attendants immediately on the commencement of the disease. This is rarely the case in hospital practice; and, in the present instance, it afforded a good opportunity for the study of the earliest phenomena of the disease. I shall give a brief abstract of its history.

Amongst the first and most prominent symptoms of the epidemic was stupor. It frequently showed itself as early as the second or third day, and continued until it was lost in coma or delirium. M. Landouzy does not mean by this stupor any degree of mere somnolence or coma. He thinks, that it differs from either of these states. The expression of the countenance is that of half-demented and stupid astonishment. This is the *stupor attonitus* of Foes. In half the cases it was strongly marked; in the other half it was slight in degree. M. Landouzy thinks, that it comes on earlier, and is more striking than the same symptom in typhoid fever. True somnolence and coma appeared in a certain number of cases, later in the disease, often about the tenth day. Profound coma, so that the

patient could not be roused, existed in only twelve cases. Delirium was very common, usually making its appearance between the third and the eighth day. It was generally low and muttering in its character, and, in fatal cases, it continued until death. Headache was uniformly present at the commencement of the disease. It was, for the most part, dull and heavy, and felt especially over the eyes. It continued for an uncertain period of time, gradually disappearing, or losing itself in coma, or delirium. *Subsultus tendinum* was common and strongly marked in grave cases. Redness of the eyes, *tinnitus aurium*, and deafness, were present in a certain proportion of cases, but differed in no obvious particulars from the same symptoms in typhoid fever. There was great loss of muscular strength from the beginning of the disease.

In every case, except the first, which was not carefully examined, there was an abundant cutaneous eruption, consisting of small spots, or ecchymoses, as M. Landouzy calls them, of a red, violet or black color, not elevated above the skin, and not disappearing on pressure. They were always found on the chest, often also on the abdomen, and in some cases they extended to the arms and legs. They commonly showed themselves about the fourth or fifth day, and gradually faded away between the tenth and the eighteenth. They were abundant and confluent in proportion to the gravity of the disease. The bodies of the sick exhaled a strong, offensive odor, resembling that of mice.

In regard to the absence of appetite, to thirst, the state of the lips, tongue and mouth, nothing special was observed, differing from what occurs in typhoid fever. Nausea was present at the commencement of the disease in all the cases. Meteorism and abdominal pains were uniformly absent. There was diarrhœa at the beginning of the disease in only four cases. In all the others there was no apparent disturbance in the functions of the intestinal canal. The bowels were more inclined to constipation than to looseness.

A distinct, well-marked sibilant rhonchus was present in all the cases. There was nothing remarkable in the frequency of the pulse. It was full and large, and, at the commencement of the disease, resisting. There was nothing unusual in the appearance of the blood. Epistaxis occurred in only eight cases. The temperature of the surface was uniformly elevated; the heat was dry and burning. In no instance was there gangrene of any part of the body.

The contagious character of the epidemic was very manifest, as has already been intimated. Three physicians, six medical students, twelve nurses, and other attendants on the sick, after they had been transferred from the prison to the hospital, amounting in all to thirty-five, contracted the fever. Amongst these there were nine deaths, or one in four, nearly; while amongst the one hundred and three prisoners, there were only eight deaths, or one in thirteen, nearly. None of the nurses, who

had had typhus fever, in 1814, were attacked with the disease; but, two medical students, and one physician, who had had typhoid fever, the former, six months, and the latter, twenty years, previously, suffered very severely.

Of one hundred and four patients, in whom the age was accurately ascertained, sixty were from fifteen to thirty years old; thirty-six were from thirty to fifty; and eight were from fifty to seventy.

The quarter of the prison in which the disease commenced, and to which it was almost exclusively confined, was originally intended to accommodate from eighty to one hundred inmates; it had usually contained from one hundred to one hundred and twenty; at the time when the epidemic appeared, its population amounted to one hundred and eighty.

Many, indeed most, of the foregoing circumstances, in the history of this local epidemic, correspond to the phenomena which we have found to occur in typhus fever. But, according to M. Landouzy, in the six autopsies which were made, the intestinal lesions, characteristic of typhoid fever, were present. The elliptical plates were either thickened, and elevated, or they were the seats of ulcerations; and the mesenteric glands, corresponding to them, were enlarged. The spleen was not increased in size in any of the cases; in four it seemed somewhat softened.

In this epidemic, if entire reliance is to be placed upon the observation of its historian, there seems to have been a union, in the same cases, of many of the

elements, which are generally found confined, either to one or the other forms of continued fever. The symptoms of contagious typhus were found in connection with the follicular lesion of typhoid fever. Is it possible, that, even admitting the two diseases to be essentially dissimilar, under certain circumstances the causes of both may be so commingled, as to give rise to a mixed disease, in which there is a combination of the elements of both? Let it be remembered, that this, as well as all analogous questions, is to be determined, not by *à priori* reasoning, however plausible and ingenious, but by simple, careful, rigorous observation. M. Landouzy, in the case before us, in the spirit of a true and sound philosophy, says, that we must await the results of ulterior observation before we shall be able to settle, definitively, this great question in regard to the identity of these several forms of fever. "In effect," he adds, "if in all future epidemics of the typhus of camps, of jails, of hospitals, &c., we find, as in that of Rheims, complete absence of disease of the spleen, and great differences between the symptoms and those of typhoid fever, we must confine ourselves to the conclusion, that typhus and typhoid fever are analogous and not identical diseases. If, on the contrary, we find, that in one epidemic diarrhœa is absent, in another, the petechial eruption, in another the rose spots, and so on, we must conclude, that these differences depend only upon variations in the action of the epidemic cause, and that the disease is, in its nature and

essence, identical with typhoid fever." M. Landouzy's conclusion, in regard to the epidemic, which constitutes the subject of his memoir, is, that the resemblances between it and typhoid fever are so numerous as to induce him to look upon the two diseases as analogous; but that the differences between them are also too numerous to allow him to regard them as identical.

I shall conclude this historical survey of facts and opinions, bearing upon the question of diagnosis before us, by a short reference to an article contained in the July and October numbers of the British and Foreign Medical Review for 1841. This article contains a pretty full exposition of the subject under consideration, and abating some mere smartnesses in its criticisms of Christison, Gerhard, Lombard, and Starberoh, it is written in a good spirit, as well as with fairness and ability. Its noble tribute to Louis has already been noticed. The writer of the paper, after an examination of all the accessible and valid evidence in the case, comes to the conclusion, that the contagious typhus of Great Britain and the typhoid fever of France are different *varieties*, only, and not distinct *species*, of disease. I have already gone over nearly all the ground occupied by this writer; I shall have occasion therefore to notice only two or three of his statements and opinions. The most important of these, in its connection with the diagnosis of the two diseases, is this; in his tabular comparison of typhoid fever and typhus, he sets down, so far as

the abdominal lesion is concerned, *as typhus*, all the cases of fever, occurring in Britain; thus settling before hand the very question at issue, in relation, at least, to one of its elements. The writer admits, that the two forms of fever may generally be distinguished during life; but alleges, that there are cases in which such distinction cannot be established. The number and authenticity of these latter, is, certainly thus far very limited; and if a difference of symptomatology, sufficiently marked to be generally and readily recognized, corresponding constantly with a most important difference in the state of certain organs, found in fatal cases, is not adequate to constitute separate diseases, it is not easy to see in what, radical nosological distinctions are to be found. In order to account for the great differences in the appearances of the eruptions in the two diseases, the reviewer suggests the hypothesis, certainly improbable and gratuitous enough, that the lesions of the skin and of the intestine may be supplementary of each other; a most facile method, assuredly, of disposing of a difficulty.

Such is the history, as full and fair as I have been able to make it, of the recent investigations in regard to the relations between typhoid and typhus fevers. Excepting those of M. Landouzy, it seems to me, that they all go to show, that the two diseases are radically and essentially dissimilar. I have no wish, whatever, to *make out a case* in this matter. I would avoid, scrupulously, anything like special pleading. The truth, as Louis's motto from

Rousseau says, is in the things, in the facts and their relations, not in my mind, which attempts to judge and to interpret them. I am anxious, only, that this truth, be it what it may, should be ascertained. That this has been done absolutely and definitively, I do not pretend. That typhoid and typhus fevers are, clearly and unequivocally, fundamentally distinct diseases, may not have been positively demonstrated. I admit, that the paper of M. Landouzy throws some doubt upon the question. But, as has been remarked before, whether the two diseases be or be not specifically and nosologically unlike each other, it is equally important, that the wide differences which confessedly do exist between them should be pointed out, and their real relations established. This I have endeavored, so far as the present state of our knowledge could enable me, faithfully and truly to do.

In regard to the identity of the former camp and jail fevers of the European continent, either with typhoid fever, or with typhus, it is not possible to come to a positive conclusion. Louis thinks, that they were typhoid; others think, that they were typhus. It is probable enough, that both forms of fever may have prevailed. At any rate, the descriptions given of them are generally so imperfect, that it is wholly impossible now to decide this question with any degree of certainty. It is quite as well, perhaps, not to attempt its solution at all.

CHAPTER IX.

THEORY OF TYPHUS FEVER.

It is unnecessary to make any general remarks upon this subject after what has been said in relation to the theory of typhoid fever. A rational interpretation of the phenomena of typhus, of their connections and dependencies, is, if possible, more difficult than in the case of the latter disease. In typhus there is no constant and uniform lesion of the solids, to which the symptoms can be referred. We certainly have here, if no where else in the nosologies, a general disease; an *essential* fever. In regard to its theory, and especially to the primary and fundamental disturbance, which, in its turn, gives rise to the subsequent and connected morbid phenomena, the sum of which constitutes the disease, British medical philosophers are mostly divided into two classes; the solidists and the humoralists. More strictly, we might call them the *neuropathists* and the *hemopathists*. The first maintain, that the impression of the morbid poison is primarily made upon the nervous system; the latter maintain, that this impression is made upon the blood. I do not propose to enter into any history of the reasons urged by the partizans of these respective theories in support of their opinions, or in any way to discuss their merits. I may be allowed to say, that

an undue degree of importance seems to me to be attached to them by their authors and advocates. They are at best only *explanations*, or *interpretations*, more or less probable, more or less ingenious, more or less plausible, of the phenomena of fever, and of the various relations of these phenomena. Sydenham's, or Huxham's, or Cullen's, may be as good as any of them. They are, probably, all of them, more or less erroneous; they may be wholly so.[1] Let us remember, besides; and a consolatory reflection this is, in the midst of these multiform and conflicting *theories*; that they constitute an element in medical science of very subordinate, perhaps questionable, value. The true science of fever is in its appreciable phenomena and their ascertain-

[1] There seems to have been in the British medical mind an irresistible tendency to philosophize in medicine, and to substitute for the careful observation of facts and their rigorous analysis, the doubtful conclusions of speculative reasoning. This tendency is clearly enough giving way to a better spirit; and there can be no hazard in predicting, that the next quarter of a century will witness a complete revolution in the temper and philosophy of British medical science. No one can doubt this who is familiar with the recent labors of British medical men; and especially with the tone and spirit of some of their leading reviews. I may refer, without the imputation of invidiousness, for an illustration of what I mean, to an unpretending, but most admirable article in the British and Foreign Medical Review for July, 1841, on the numerical method of investigation; and to more than one other paper in the same Review, containing full and frank acknowledgments of the immense obligations, which our science owes to the labors and the example of Louis; to whom, it is no extravagant praise to say, that the spirit of Dryden's couplet, so far as medicine is concerned, is as applicable as it was to the great expounder of true philosophy:

> The world to Bacon does not only owe
> Its present knowledge, but its future too.

able relations; not in any explanation of the nature of these phenomena and these relations.

CHAPTER X.

TREATMENT.

I shall not enter so fully into the therapeutics of typhus as I have already done in relation to that of typhoid fever. This is unnecessary, for two reasons; in the first place, typhus is not a disease of common occurrence amongst us; and, in the second place, although there is not, by any means, entire uniformity of opinion amongst the best and most extensive observers, in regard to the most appropriate treatment of this disease, in all its details, and under all circumstances; still, there is a good degree of agreement in regard to some of the leading points in its management. I shall say what seems to be necessary to the practical understanding of this subject; treating, in so many sections, of individual remedies, or classes of remedies, and arranging them somewhat, at least, in the order of importance, which has generally been attached to them.

Sec. I. — *Bleeding*. General bloodletting has

been pretty commonly resorted to by British practitioners in the management of typhus; although there seem to have been, at all times, some practitioners, more than doubtful about the propriety of this remedy. One very striking fact, however, is observable in connexion with this subject; and that is the extreme caution with which bleeding is, almost without exception, recommended and practiced. Sangradoism was never popular in the treatment of typhus. Amongst the older practitioners, Sydenham, Pringle, and Grant were bleeders; but they were moderate bleeders, as most of their successors have been. Dr. Edward Percival recommends bleeding where there is pneumonic complication, to the extent of from eight to fourteen ounces; and says, that sometimes, though rarely, it may be repeated once or twice. He cautions his readers against large bleedings; and says, that patients will sink under them. Dr. O' Brien bled early, to the extent of from six to eight ounces, and repeated the process, if necessary, once or twice. Dr. Grattan, and this only when the lungs were affected, adopted the same cautious practice. In one hundred and sixteen patients, whom he bled at the Cork Street Hospital, in 1818, the average quantity of blood taken from each was only five and a half ounces. Dr. John Cheyne, of Dublin, had the reputation of being a free bleeder; but he, also, was cautious. He says, that he has known the operation to destroy life; and that there are many cases of the disease, in which, during all

their stages, it is wholly inadmissible. His average quantity at a bleeding was only ten ounces; and he rarely exceeded twelve. When more than this amount was to be taken, he considered it his duty to be present, and to superintend the operation. Dr. Armstrong recommends one or two moderate bleedings, early in the fever, and when it is complicated with local inflammation. Dr. Southwood Smith is one of the most liberal bleeders amongst recent British writers on typhus. But his practice is founded on an assumption doubly gratuitous; first, that inflammation is, in all cases, the morbid condition, which is to be removed; and, secondly, that it is the only morbid condition in typhus fever over which we have any control. The phraseology of his directions for bleeding is, as it always is, clear, distinct, and emphatic; but the ideas contained in his eloquent words are not so manifest and intelligible as might be wished. He insists upon the necessity of bleeding till local pain is, not diminished only, but removed; till inflammation is not merely mitigated, but subdued. The mere mitigation of inflammatory action by bleeding, he even thinks is more hurtful than beneficial. Dr. William Henderson's admirable account of the typhus fever of Edinburgh, in 1838, and 1839, has already been frequently referred to. His analysis of the results of his treatment is especially valuable. Of ninety-six females admitted into the Infirmary, during a given period of time, thirty-six were bled from the arm; and the average quantity taken from

each patient was twenty ounces. The circumstances which were looked upon as indicating the propriety of bloodletting were, that the fever should not have been in an advanced stage; the individual not of a delicate or previously enfeebled constitution; the pulse at least firm, whether small or full; and either particular local suffering, or general pains, restlessness, and flushing. In three instances, some of the most important of these indications were wanting; and two of the three were fatal. The average duration of the cases, that were bled, and recovered, up to the commencement of convalescence, was eleven days and two-thirds; and the mortality was one in eighteen. Fifty-two other female patients, also admitted, successively, during a given period, who were not bled, gave a mortality of one in ten; and the average duration of these cases, excluding those of a milder character, in which no wine was given, was fifteen days and a half.[1] In the Philadelphia typhus of 1836, bloodletting was rarely practiced, and did not appear to be well borne.

The immediate effects of bleeding seem to be much more obvious and decided in typhus than they are in typhoid fever. Thus, of one hundred and forty-nine patients, in whom this means was resorted to by Dr. Cheyne, in 1816, ninety-four experienced immediate relief. In nearly all the cases, treated at Edinburgh, by Dr. Henderson, in

[1] Edin. Med. and Surg. Journ. Oct. 1839.

1838, and 1839, the operation of bloodletting was followed by speedy relief or removal of the local pains, and frequently by a mitigation in the severity of other symptoms.

The conclusions to which we come then, in regard to this important practical matter, are these; first, that general bloodletting, to a moderate extent, repeated once or twice, if the indications call for it, in the early period of the disease, especially in cases where the previous health of the patient had been sound, where the pulse is somewhat hard, and where there is severe local pain, constitutes a remedy of great and unquestionable value; that it mitigates the severity, shortens the duration, and lessens the mortality of the disease; secondly, that this remedy is always to be used with caution; that there is an unknown element in the pathology of typhus fever, which renders this caution always necessary, and which, under many circumstances, and in many cases, renders the remedy wholly inadmissible. Amongst the contra-indicating circumstances may be mentioned the advanced stage of the disease; previous debility, or ill health of the patient; a constitution impaired by excesses, and particularly by that of dram drinking; the absence of the special indications for bloodletting, which have already been enumerated; and, finally, the predominance of the congestive or typhoid state, characterized by the extreme prostration of strength, feebleness of the pulse, and torpor of the surface, which marks the disease, more or less strongly, dur-

ing certain seasons. It ought to be added here, that some of the Irish and Scotch practitioners do not resort to the use of bloodletting at all in the treatment of typhus. Amongst these may be mentioned Dr. Mateer, and Dr. Little, both of Belfast. They seem to consider the disease as essentially one of debility. Dr. Graves, also, thinks, that the proportion of cases, in which general bloodletting can be practiced with advantage and safety, is small.

Local bloodletting may be resorted to with very uniform benefit. There is great unanimity of opinion in regard to the safety and the usefulness of this remedy. Scarified or dry cups, applied to the nucha, or along the spine, between the shoulders, have been found of great efficacy in removing or diminishing the suffusion of the eyes, the injection of the face, the headache, the delirium, and other symptoms. They constituted, in nearly all the cases, a part of the treatment pursued by Dr. Gerhard, at Philadelphia, in 1836. Speaking, generally, of dry cups, he says, — "applied in considerable numbers, and left upon the nape of the neck, and between the shoulders, for twenty minutes or half an hour, they always seemed to me a more powerful remedy in nervous functional derangement, not attended with inflammation, than scarified cups. I have used them largely in the treatment of the apoplectic symptoms of malignant intermittent with the best effects, and resort to them with confidence as one of our most powerful means of controlling disordered nervous action."

Sec. II. — *Purgatives.* The use of purgatives in typhus fever by British physicians has been almost universal. At one of the Dublin Fever Hospitals, under the care of Dr. Cheyne, it was formerly one of the standing directions for the nurse to administer, immediately, to a newly received patient, two pills, composed of one grain each of calomel, scammony, and aloes; the pills to be followed, in three or four hours, with a purgative mixture. Nearly all the Irish writers reckon purgatives second only in importance to bloodletting, and much more generally applicable than this remedy. Some of them rely almost wholly upon them, and upon the ordinary hygienic measures applicable to most febrile diseases. They recommend, that mild purgatives, especially during the early periods of the disease, should be so administered and continued as to procure two or three discharges from the bowels daily. A small quantity of calomel usually enters into the composition of the purgative, although the action of the mercury upon the mouth is not generally considered desirable. From an examination of the opinions of the best modern observers, it is quite clear, I think, that active and drastic purging is to be avoided.

Sec. III. — *Affusions and Ablutions.* The agreement of opinion and practice in regard to the external use of water, at different temperatures, according to circumstances, is hardly less general, than it is in relation to the necessity of purgatives.

Dr. Percival used the cold affusion, especially in the treatment of children; pouring several gallons of cold water from a bucket over the head and body. On account of the inconvenience of this mode, and for other reasons, perhaps, the process of ablution or sponging has generally been preferred. When the skin is uniformly hot and dry, the water may be applied, in this manner, quite cold; but if the temperature is not much elevated, or if there is slight or partial perspiration, it is safer and better, that it should be tepid. Dr. Gerhard says, that by frequent sponging he found that he could regulate the heat of the surface with great ease, and in some degree, also, could moderate the cerebral symptoms. Dr. Graves, of Dublin, has found, that the pain in the head, and other symptoms of over excitement in the brain, are often more speedily and effectually relieved by applying fomentations of hot water, than they are by the common cold applications. This is in accordance with the extensive experience of my friend and colleague, Dr. Dudley, in the similar treatment of many local affections of a painful or inflammatory nature.

Sec. IV. *Stimulants and tonics.* The almost uniform experience of British observers has sanctioned the use of stimulants in the treatment of this disease; and, amongst the individual articles of this character, a very general preference has been given to wine. Some of them urge its administration earlier in the fever than others, and in more liberal

quantities; but none of them, so far as I know, dispense with it altogether. Dr. Stokes, of Dublin, said, in 1839, "I feel certain, humiliating though the confession may be, that the fear of stimulants in fever with which I was imbued, was the means of my losing many patients, whose lives would have been saved, had I trusted less to the doctrine of inflammation, and more to the lessons of experience given to us by men who observed and wrote before the times of Bichat and Hunter."[1] When the cutaneous circulation is languid, and the skin not hot, when the pulse is soft and feeble, and there is great exhaustion and debility, at whatever stage of the disease, there can be no doubt as to the necessity of the stimulating and supporting treatment. During some epidemics, when the adynamico-congestive element in the pathology of typhus is marked and predominant, this condition of the system will often be present at the commencement of the fever, and will require the early use of stimulants and tonics. More commonly, however, this state of things attends the later period of the disease, coming on as the febrile excitement subsides; and then it must be met by the same remedies, with an activity and assiduity commensurate with the urgency of its symptoms. Dr. Gerhard, in his account of the Philadelphia epidemic of 1836, says: "it is difficult to conceive the extreme prostration in which our patients were left

[1] Dub. Jour. of Med. Sci. March, 1839.

after a severe attack of fever. The skin is usually cool, and the pulse weak and fluttering, but there is still muttering delirium, and great feebleness. Under these circumstances, wine, combined with quinine, and a nutricious diet, produced an effect which was almost magical." Dr. Stokes thinks, that in addition to the ordinary indications for the use of wine in typhus, may be placed want of energy in the action of the heart, as shown by its diminished impulse, and the feebleness or extinction of the first sound. He says, that the existence of these phenomena, at an early period of the disease, has sometimes led him "to anticipate the bad symptoms, and to commence in good time the use of the great remedy;" and that "in others, notwithstanding the existence of severe visceral irritations, the use of stimulants has been adopted with the best success, from the same indication."[1] It does not appear to be necessary that wine should be given in very large quantities. The daily amount, used by Dr. Gerhard, varied from four to sixteen ounces; in most cases from six to eight.

The only other articles belonging to this class of remedies, of which it is necessary to speak particularly, are the preparations of cinchona. Dr. Gerhard, in the latter stages of the disease, during the Philadelphia epidemic, and under the same circumstances that indicated the necessity for wine, employed the sulphate of quinine, given in solution,

[1] Dub. Jour. Med. Science, March, 1839.

to the extent of about twelve grains in the twenty-four hours. Speaking of tonics generally, he observes; "they not only exercised a gradual and permanent influence upon the appetite and strength of the patient, but they produced an immediate impression. The improvement was sometimes so rapid, that it was very obvious from one day to the next." Amongst the means for restoring, temporarily at least, the exhausted and flagging energies of the system, may be included the external application of dry heat, and the use of sinapisms. Dr. Gerhard says of these latter, "They were of great and undoubted advantage in the stage of prostration, which occurs at the decline of the fever, and certainly contributed to save the lives of several of our patients. He also found them useful in diminishing the stupor and prostration during the disease, as well as in reanimating the strength of patients who were brought to the hospital, exhausted from neglect, and a fatiguing ride from a distant part of the town. But if the fever was high and the heat of the skin considerable, sinapisms were vastly less effectual than when the skin was cool, and the patient seemed sinking from mere exhaustion."

Sec. V. — *Miscellaneous remedies.* It would be an irksome and not very useful task to enumerate all the articles, which have, by one observer and another, been recommended, under certain circumstances, and for the purpose of answering peculiar

indications. I will briefly mention some few of these, the efficacy of which has been best established.

Diaphoretics seem to be of considerable service in allaying the intensity of febrile excitement. Dr. Little, of Belfast, classes them amongst his most useful remedies. The most powerful of these has already been spoken of; I mean the cool and tepid ablution of the body. Amongst the most unexceptionable, perhaps, of those to be used internally are the effervescing draughts, and the liquid acetate of ammonia. James's powder has been a favorite article with some practitioners.

When bronchitic or pneumonic complications have not been removed by the remedies already spoken of, resort may be had to vesication, and to the guarded use, internally, of ipecacuanha and antimonials. In some cases where the bronchial secretion was very abundant, Dr. Henderson found great benefit from the administration, several times a day, of from half a grain to two grains of the acetate of lead, combined with a small quantity of Dover's powder, and one or two grains of squill. Dr. Graves, of Dublin, has made use of antimony, in the treatment of typhus, under peculiar circumstances, the credit of which novelty he claims as entirely his own.[1] In the latter stages of the disease, when there is, in addition to other symptoms, great prostration of strength, and extreme nervous

[1] Graves's Clinical Lectures, p. 130, *et seq.*

restlessness and sleeplessness, he gives tartar emetic, in solution with camphor mixture, and combined with laudanum. Six grains of the antimony are given in the course of the twenty-four hours. This combination, under these circumstances, he thinks, possesses an almost magical power, in allaying the nervous restlessness and in procuring sleep.

In regard to the utility of emetics there is some difference of opinion. They have been mostly used under two circumstances; first, at the very commencement of the fever; and, secondly, when a relapse, or an aggravation of the symptoms has been threatened, at, or near the beginning of convalescence, occasioned by some indiscretion of diet. Dr. Gerhard thinks, that they were useful, at Philadelphia, in 1836, in diminishing the violence of the fever. Dr. Graves speaks very highly of their efficacy, and very confidently, also, of their power, if administered within the first twenty-four hours from the time of seizure, of wholly arresting the disease.

Camphor and opium are amongst the articles, which have been extensively used, for the purpose, principally of allaying nervous agitation and restlessness, and inducing quiet and sleep. As a general rule, they seem to be most effectual in accomplishing these purposes, when the generile febrile excitement is not very great, and when there are no indications of irritation or congestion of the brain. I shall conclude these directions for the formal, medical treatment of typhus with Dr. Ger-

hard's remarks upon these two substances. "Camphor," he says, "was certainly amongst the most useful and powerful of our remedies. We used it largely in the severe cases, especially those in which the ataxic nervous symptoms were very marked; and we had no reason to repent its employment. In general there was a marked diminution of some of the most prominent and harassing symptoms. We gave the camphor in emulsion in doses of five grains, every two hours, and in enema in doses of a scruple. The immediate effect was the lessening of the subsultus and tremors, for which it was chiefly administered, and sometimes the diminution of delirium. In some cases we possessed a complete control over the subsultus, which was immediately checked by an injection containing a scruple of camphor. It would cease for some hours, but afterwards return nearly with its former severity. Still it was a useful palliative, and, like most remedies of its class, acted as a useful balance-wheel in preserving the harmony of the system until the disease had passed through its natural course. The camphor frequently acted powerfully as an anodyne when sleep had been interrupted by the previous disturbance of the nervous system."

Huxham is high in his praise of camphor. "Its anodyne demulcent quality," he says, "makes it vastly serviceable, in quieting the *Erethism*, and bringing on composure of spirits and easy sleep, when opiates fail, nay, augment the tumult and hurry."

"Opium and its preparations," continues Dr. Gerhard, "were used by us in a considerable number of cases. Dr. Pennock was the most pleased with their effects. When the insomnia had been tormenting and incessant, and the patient was exhausted by agitation and nervous restlessness, a small dose of morphia would generally calm the agitation and procure sleep. This advantage was so great, that we were induced to give opiates in cases which were opposed to our ordinary notions of the proper condition of the system for their employment. We observed no inconvenience from them, and found the morphia occasionally of so much benefit, that we should class it amongst the decidedly useful remedies. It is not a remedy which should be used in large doses; as patients with typhus are certainly more readily affected by its narcotic properties than they are in any other disease. An eighth or a sixth of a grain was the usual dose, and was enough to procure sleep. Opiates are obviously improper when there is much dulness of intellect, attended with great suffusion of the eyes and countenance." Another positive contra-indication to the use of opium, first pointed out and insisted upon by Dr. Graves of Dublin, is to be found, according to this writer, in a contracted state of the pupil. When this is present he thinks opium is always injurious. Reasoning from the effects of belladonna in occasioning dilatation of the pupil, Dr. Graves was led to suppose, that, given in cases of typhus attended with contraction of the

pupil, it might remove the unknown condition of the brain upon which the contraction depends; and he says that he has used it repeatedly, under these circumstances, with very satisfactory results.[1]

The diet, when the fever begins to decline, should be somewhat more nutritious and supporting, than under the same circumstances in typhoid fever. The contagious character of the disease should be borne in mind, and every means taken to prevent a concentration of its peculiar poison. It seems hardly necessary to insist upon the paramount importance of cleanliness, free ventilation, quiet, and good nursing. There is no disease in which all these are more essential to the welfare and safety of the patient than they are in this.

CHAPTER XI.

DEFINITION.

This disease, in the present state of our knowledge respecting it, may be defined in the following terms: — Typhus Fever is an acute affection; occurring at all ages of life; attacking, at least in cities, somewhat more frequently, persons who are recent, than those who are old or permanent resi-

[1] Dub. Jour. of Med. Sci. July, 1838.

dents; often transmitted directly from one individual to another; very much more common in the British islands than anywhere else, although prevailing, at times, in other countries, generally in the form of circumscribed epidemics; often connected with the crowding of many persons into small, dark, and poorly ventilated apartments, amidst filth and destitution; sometimes sudden, and sometimes gradual in its access; attended, at its commencement, with chills, usually slight, and in many instances repeated; then with morbid heat of the skin, in many cases very intense and pungent; with increased quickness, with softness, and feebleness of the pulse; with accelerated respiration; in many cases with the physical signs of bronchitis and pulmonary congestion; with pain in the head, back and limbs; dulness or pervasion of the powers of the mind; drowsiness or stupor; dizziness, deafness, and ringing or buzzing in the ears; morbid sensibility of the skin and muscles on pressure; extreme prostration of muscular strength; spasmodic twitchings of certain muscles; dull and stupid expression of the countenance; fuliginous flush of the face; suffusion of the eyes; with loss of appetite and with thirst; sometimes with a slightly altered tongue, but in grave cases, with a dry, red, brown, or black, and fissured state of this organ; sordes upon the teeth and gums; occasional nausea and vomiting; frequently with a constipated or sluggish state of the bowels; epigastric and abdominal pain and tenderness; the skin of the body and extremities being generally the seat of an

abundant eruption, coming out, in most cases, between the fourth and seventh day of the disease, and declining at uncertain periods during the second and third week, consisting of small spots, generally somewhat obscurely defined and irregularly shaped, not unfrequently grouped and confluent, of a dusky, dingy red color, not elevated above the surrounding surface, and disappearing only imperfectly, or not at all, on pressure; the body of the patient in grave cases, giving out a pungent, offensive and ammoniacal odor; which symptoms differ, very widely, in their duration, in their march, in their severity, and in their combinations in different cases; several of them being frequently wanting; but enough of them being generally present to characterize the disease; the most constant of which are the loss of strength, the stupor, the suffusion of the eyes, the fuliginous skin, and the dusky, cutaneous eruption; which symptoms may either gradually diminish in severity, and finally disappear, between the seventh and thirtieth day of the disease; or may increase in severity and terminate in death between the third and twentieth day from their access; the liability to a fatal termination being much less, early than late in life; the bodies of patients exhibiting, on examination, after death, no constant pathological changes of any of the organs; but, in a considerable, though varying proportion of cases, engorgement of the vessels of the brain, with moderate sub-arachnoid serous effusion; engorgement of the posterior portion of the lungs; redness of

the mucous membrane of the bronchia; softening, or mamelonation of the mucous membrane of the stomach; the blood being generally of a dark color, often fluid, or grumous, the coagula, when formed, soft and non-fibrinous; and the body, in many cases, running rapidly into decomposition; which disease, thus characterized, and defined, constitutes a peculiar, individual affection, differing essentially from all others; although related by many analogies to typhoid fever.

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PART THIRD.

AN ESSAY

ON THE

DIAGNOSIS OF BILIOUS REMITTENT,

AND OF

YELLOW FEVER.

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PART THIRD.

BILIOUS REMITTENT, AND YELLOW FEVERS.

CHAPTER I.

BILIOUS REMITTENT FEVER.

I PROPOSE, in the following essay, to indicate the principal points of difference, in the first place, between bilious remittent fever, and the two continued fevers, which have been already described; and, in the second place, between bilious remittent and yellow fever. This can be satisfactorily done only by instituting a somewhat detailed comparison between these several diseases; although I do not intend to go any further into the natural history of bilious remittent fever, and of yellow fever, than is necessary to establish their diagnosis, and to fix their nosological positions and relations.

As a general rule, the access of remittent fever is more sudden than that of typhus or of typhoid fever. Its commencement is more formal and well-defined. The transition from health to disease is more rapid and more clearly marked; and it is

much easier to fix upon the exact period of this transition in remittent than in either of the other fevers. These remarks are to be understood as only generally and not universally and absolutely applicable; since there are cases both of typhoid and typhus fever, in which the severe and formal access of the disease is not preceded by any indications of ill health, while such indications do sometimes precede the access of the disease in remittent fever.

One of the earliest and most constant symptoms of remittent fever is a chill or rigor, more or less severe. This, it is well known, is also a very constant and early symptom of continued fever, and indeed of most acute diseases of any considerable degree of severity. But the chill of remittent differs, in some respects, from the same symptom in typhoid and typhus fevers. It is generally more formal. It rarely consists of a mere sense of coldness, recurring at short intervals, and alternating with sensations of feverish heat, as is frequently the case in the latter diseases. The chill in remittent fever, also, when it does recur, recurs at regular and definite periods. These periods are almost always at intervals of twenty-four or forty-eight hours, constituting the quotidian or tertian type of the disease. In most cases of simple remittent the rigor is not very severe; in many it is quite slight.

The temperature of the surface in remittent fever is often very considerably elevated, but rarely pungent. Sometimes the skin of the head and

extremities is cool, while that of the trunk is hot. The greatest difference, so far as this symptom is concerned, between remittent fever on the one hand, and typhoid and typhus fevers, on the other, consists in the greater and more regular variations of temperature in the former than in the latter diseases. In remittent fever, even when the initial chill or rigor is not repeated, once in twenty-four, or, as more frequently happens, once in forty-eight hours, and, this with a great degree of regularity, there is a striking augmentation of the heat of the skin. In the intervals between these exacerbations, constituting what are called the *remissions* of the fever, the temperature of the surface is often either natural, or even lower than natural. In typhoid and typhus fevers, there is, in most cases, a febrile exacerbation, but it is almost always diurnal in its recurrence, and very much less strongly marked than in the remittent fever.

The skin is frequently of a sallow or yellowish color. In a few cases there are sudamina, mostly confined to the neighborhood of the neck, but never any other cutaneous eruption, unless it be wholly accidental. Neither the rose spots of typhoid fever, nor the dusky eruption of typhus are ever seen in remittent fever.

The pulse in remittent, is generally less rapid than in continued fever, and, like the other febrile symptoms, is subject to greater variations. During the exacerbations it is considerably accelerated, but in the intervals, it often falls down to its natural

standard. Of eleven cases, in the Pennsylvania Hospital, in which the frequency of the pulse was particularly noted by Dr. Gerhard, it was more than a hundred in the minute in only two. Its other characters are various in different cases, and under different circumstances, and have nothing sufficiently constant or distinctive to render them of any value as diagnostic signs.

Symptoms consisting in disturbance of the respiratory functions are much less frequent and prominent in remittent than they are in typhoid and typhus fevers. Cough is not often present, and there are rarely any physical signs of thoracic disease.

Pain in the head is as constant and severe in the early periods of remittent as it is in the corresponding period of typhoid and typhus fevers. It is less continuous, however, than it is in the latter diseases, being increased in severity during the paroxysms of the fever.

One of the most striking and invariable differences between remittent and continued fever, consists in the state of the mind. In the former disease it is very rarely affected to any appreciable extent. Of eleven cases, observed by Dr. Gerhard, in 1834, at the Pennsylvania Hospital, all terminating in recovery, there was slight delirium in only one. So also, Dr. Stevenson found at the same institution, in 1838, that of fifteen recovered cases, delirium was present in only two; in one of these it was slight, and in the other, although violent, it

was intermittent and temporary. In fatal cases, also, the intellect preserved its integrity, or there was only a slight and wandering delirium towards the fatal termination.[1]

Drowsiness, occasionally, near the close of life in fatal cases, passing into coma, is somewhat more frequent than delirium, but still very much less common than it is either in typhoid or typhus fever.

The senses are less constantly affected in remittent than they are in typhoid and typhus fevers. Dulness of hearing and ringing in the ears are rarely noticed, neither is there often any trouble or disturbance of vision. After the first few days it is quite common for the eyes to become yellow or yellowish. Dr. Gerhard noticed some degree of dizziness in five of eleven cases. Epistaxis occurs occasionally, but not often.

In regard to the loss of muscular strength, I do not know, that there is any very constant difference between remittent and continued fevers. Spasmodic twitchings of the muscles, however, are very rare in the former disease, even in grave and fatal cases. Dr. Stewardson noticed *subsultus tendinum* in only one of his cases, and hiccup during the last two days of life, in one case. There were no spasms in any one of the eleven cases, already alluded to, noticed in 1834, by Dr. Gerhard.

The condition of the tongue and mouth is quite different in remittent from what it is in typhoid

[1] Am. Journ. of Med. Sci. April, 1842.

and typhus fevers. The tongue is generally moist, and covered with a thick fur, of a whitish, or yellow, or yellowish white color. In grave and prolonged cases, it sometimes becomes brownish and dry. Even in these, according to Dr. Stewardson, it is rarely red or cracked, and in two cases he has seen it paler than natural. The tongue begins to clean earlier in remittent than in the two continued fevers. Dr. Stewardson says, that in eight of eleven cases, where this circumstance was noted, the tongue began to clean on or before the twelfth day of the disease, and in the remaining three from the thirteenth to the twentieth.[1] Sordes about the gums and teeth is as rare in remittent as it is common in typhoid and typhus fevers.

Nausea or vomiting, or both, are very constantly present in remittent fever. They generally occur at or near the commencement of the disease, but sometimes not till after the expiration of the first few days. In Dr. Stewardson's cases, the matter vomited was almost always green. This state of the stomach is present in a certain proportion of cases both of typhoid and typhus fever, but it is much less common than it is in remittent fever.

Diarrhœa is a rare symptom in remittent fever. Dr. Stewardson says, that at the Pennsylvania Hospital, "the bowels were generally costive; the purgative medicines, which were given, both before and after admission, rarely occasioning hyperca-

[1] Amer. Jour. of Med. Sci. April, 1842.

tharsis. In a few instances, spontaneous purging was present, near the commencement of the disease, and continued for a few days, but subsequently the bowels were either regular or costive, unless when operated on by medicine."[1]

True tympanitic distention of the abdomen is rarely met with in remittent fever, and the same thing is true of general tenderness and pain of this region. There is a condition, however, of the superior portion of the abdomen, which is very common in this disease, but which is rarely met with, to the same extent, at any rate, in typhoid or typhus fever. This consists in pain, or tenderness on pressure, or both, extending across the epigastrium from one hypochondriac region to the other. This pain or tenderness is not unfrequently accompanied by a feeling of weight, tightness, and oppression, and is often quite severe. There is also considerable fulness across the same region. The pain and soreness are more frequent in the left than in the right hypochondrium, and this circumstance is attributed by Dr. Stewardson, who has particularly called the attention of the profession to this group of symptoms, to the enlarged and congested state of the spleen.[2]

Such are some of the principal points, so far as the symptomatology alone is concerned, in which remittent differs both from typhoid and typhus fever. There are still others, connected with its pathology,

[1] Amer. Jour. of Med. Sci. April, 1842. [2] Ibid, April, 1842.

duration, causes, and so on, not less striking. I shall now enumerate the more important of these.

The pathological lesions in remittent fever have been less extensively and carefully studied than those of most other febrile diseases. The descriptions of the organs, after death, which have been given us by most writers, are made in such general and indefinite terms, as to be of very little positive value. To the pathological histories, however, of nine cases, which were examined in the Pennsylvania Hospital, two in 1834, by Dr. Gerhard, and seven, during the years 1838, 1839 and 1840, in the same institution, by Dr. Stewardson, these remarks are not applicable. These nine histories are furnished us by experienced and competent observers, every way qualified to recognize the pathological peculiarities of the disease, and to point out the differences and the resemblances between its lesions and those of other essential fevers. Although their number is not sufficiently large to have settled definitively, the morbid anatomy of remittent fever, they have done more for this purpose, especially those of Dr. Stewardson, and are of more real and absolute value than all similar histories which had previously been written.

Of the organs contained within the cavity of the chest, it is only necessary to remark here, that they seem very rarely to be the seat of any considerable lesion, in remittent fever. The condition of the blood, according to Dr. Stewardson, is generally altered; but the precise character of its changes

has not been sufficiently ascertained to render them of any service in diagnosis.

Neither the brain nor its membranes have been found to be the seat of any peculiar or constant alteration.

The mucous membrane of the stomach is very generally, if not always, more or less changed from a healthy condition, in remittent fever. In five of six cases, where it was particularly examined by Dr. Stewardson, evident traces of previous inflammation were present. These traces consisted of mamelonation, and changes in the thickness, consistence and color of the membrane, variously combined in different cases. Similar appearances were found in the two cases described by Dr. Gerhard.

The mucous membrane, both of the small and large intestines, is generally free from any considerable alteration; only such accidental lesions being found as are common after death, in most acute diseases. The elliptical plates have been found uniformly healthy. It is worthy of remark, that in all the six cases, examined by Dr. Stewardson, in which the duodenum was particularly noticed, the mucous follicles, or glands of Brunner, were very distinct and prominent.

The liver, in all the cases where it was examined by Dr. Stewardson, had undergone a striking and peculiar change of color. This color consisted of a mixture of gray and olive, the natural reddish brown being entirely extinct, or only faintly to be traced. "In most of the cases," says Dr. Stew-

ardson, "the liver is described as being of the color of bronze, or a mixture of bronze and olive; in one as a dull lead color externally, internally bronzed with a reddish shade; in another as between a brown and an olive, the latter predominating; and finally, as a pale slightly greenish lead color, with a tinge of brown in one instance."[1] This peculiar alteration of the liver, Dr. Stewardson is disposed to think will be found to constitute the essential anatomical characteristic of remittent fever, and very probably, also, of the pernicious remittents and intermittents; although he very properly admits, that the number of his cases is insufficient to determine this point definitively, and that it can be settled only by more extensive observation. The substance of the liver seems to have been generally somewhat softened. The contents of the gall bladder were commonly abundant, fluid and quite thin. There was nothing uniform in their color.

The spleen appears, also, to be the seat of a constant alteration in remittent fever. In all the cases described by Dr. Gerhard and Dr. Stewardson, this organ was softened and enlarged, and generally to a great degree. In one of Dr. Gerhard's cases it was of a dark blue color; in the other it was very black, and of a pulpy consistence. In three of Dr. Stewardson's cases, "where the measurements are given, it was about seven inches long by from four to five broad, and in three others the

[1] Amer. Jour. of Med. Science, April, 1841.

lowest degree of enlargement is stated at from four to five times its natural size. The softening also was great, amounting generally to pulpiness, and as the color was dark, the aspect of the organ was frequently very much that of a sac containing black, clotted, venous blood."[1] The mesenteric glands are free from disease.

In this comparison between remittent fever on the one hand, and typhoid and typhus fevers on the other, I have already spoken of the more distinctly periodical type and march of the disease, which is observed in the former. Its duration also is much less than that of typhoid fever, and probably less than that of typhus. In eleven cases, noticed at the Pennsylvania Hospital by Dr. Gerhard, the average duration is put at fourteen and a half days. The mean duration of the cases occurring at the same hospital, in the years 1838, 1839 and 1840, and terminating favorably, appears to have been between fifteen and sixteen days.

The influence of certain causes, in the production of remittent fever, is quite different from the operation of the same causes in connection with typhoid and typhus fevers. I allude particularly to season and locality. It is not compatible with the design of this work, that I should enter fully into the consideration of this subject any more than I have done in regard to other portions of the general history of the disease, and it is sufficient to say

[1] Amer. Jour. of the Med. Sci., April, 1841.

here, that remittent fever is a disease of certain seasons and certain localities, and that in both these respects it differs from the two forms of continued fever. The period of its greatest prevalence extends from the latter part of summer through the autumn, varying somewhat, of course, with the climate of the locality. Dr. Stewardson says, "it is uniformly true, that the admissions for remittent fever into the Pennsylvania Hospital are almost exclusively confined to the months of August, September and October, of each year." Dr. Heustis says, that the disease, in Alabama, generally ceases, as an epidemic, about the tenth of October, although occasional cases continue to occur after that time.

Again, remittent fever is especially a disease of warm climates, and of low, wet, or marshy localities. It rarely, if ever, originates in any of the New England States. It prevails extensively throughout all the middle and southern portions of this union; and in connection with those other two members of this three-fold family — intermittent, and congestive fever — consisting merely of forms or modifications of the same essential disease, it constitutes the principal fever of these extensive regions. Many of the cases, which are annually received into the New York and Philadelphia hospitals, are received from the ports of the southern Atlantic States, from Wilmington, Georgetown, Norfolk, Charleston, Savannah, &c. From the Atlantic coast, south of Long Island, to the immense valley of the middle and southern Mississippi, and so on

to the sources of its western tributaries, in one of the three forms, which have just been enumerated, more or less distinctly marked, often running into each other, by imperceptible gradations, mutually convertible into each other, differing to some extent in appearance, and very widely in severity and fatality, during different seasons, and in different places, this is the great, annual, autumnal disease. It is hardly necessary to say how widely different is the influence of season and locality in their connection with typhoid and typhus fevers.

I do not know whether this point has been very carefully studied, but I think, that the direct effects of the ordinary exciting causes of disease, such as fatigue, excesses, sudden exposure to wet and cold after the body has been heated by labor, and so on, are more obviously and frequently witnessed in the production of remittent than they are in the production of typhoid or typhus fever.

Remittent fever is not unfrequently followed by certain sequelæ, which are not often met with after the latter diseases. The most common of these consist of induration and other structural changes of the spleen, and sometimes of the liver; and neuralgic and paralytic affections, especially of the lower extremities.

There is still another very constant and well-marked difference between the diseases, in the comparison of which I am now engaged; and this consists in the very different effects upon them of remedies. The observations of all competent observers

agree in showing, whatever some few amongst them may imagine to the contrary, that typhoid fever is under the influence of remedial measures only to a very limited extent. Typhus fever would seem to be somewhat more under the control of treatment, although, in many cases this control is far enough from being very obvious or striking. In remittent fever, on the other hand, the effect of certain remedies, under certain circumstances, is very uniformly immediate and unequivocal. In the early and active stage of the disease, for instance, and during the febrile exacerbation, the pain in the head, and the epigastric fulness, tenderness and oppression are very surely relieved by the abstraction of blood from the neighborhood of the suffering organs. This relief is also promoted by the action of cathartics. Later in the disease, and when, as old Senac says, we have *paved the way* for their use, by subduing the high feverish excitement, and produced a distinct remission ; the effects of the preparations of cinchona are decided, and often almost immediate in mitigating the severity, and in abridging the duration of the disease. There is nothing at all like this in the influence of treatment upon the symptoms either of typhoid or typhus fever.

I will recapitulate, briefly, the principal points, which have now been gone over. Remittent fever differs from both typhoid and typhus fever, especially in the following particulars, to wit: in its mode of access, which is generally, but not always, more sudden

and more formally marked; in its febrile symptoms, which are more regularly and distinctly periodical in their march; in the uniform absence of any characteristic cutaneous eruption; in the frequent sallowness and yellowness of the skin; in the rarity of thoracic symptoms or signs; in the state of the mind and senses, which are very rarely perverted or affected in any considerable degree; in that of the muscles, which are as rarely the seat of spasms; in the appearance of the tongue, which is usually moist and covered with a thick whitish or yellowish coat; in the absence of sordes from the teeth and gums; in the great frequency of nausea and vomiting; in the fulness, tenderness, and distress across the upper part of the abdomen; in the pathological alterations of the stomach, the liver and the spleen; in its shorter duration; in the influence of season and locality in its production; and in the more decided and uniform effects of certain remedies in the mitigation or removal of certain symptoms, in lessening the severity and in shortening the continuance of the disease. In addition to these numerous and well-defined distinctions, which characterize remittent fever when compared with the two continued fevers, which have been described in the foregoing pages; the former disease differs, further, from typhoid fever, in the absence of true meteorism, in the infrequency of diarrhœa, in the healthy condition of the elliptical plates and the mesenteric glands, and in the liability of every age to its repeated attacks.

In some rare instances, where the disease is protracted, where the remissions are obscurely marked, where the tongue becomes dry and brown, where there is some delirium or stupor, and where other indications of the *typhoid state* show themselves, there may be some difficulty in forming a positive diagnosis. But even under these circumstances, the previous history of the case, and the absence of many of the symptoms of typhoid and of typhus fever will prevent us from mistaking the disease for either of these latter affections.

Well-marked, common intermittent fever can never be confounded with either of the continued fevers, which constitute the subject of this work. The same thing, I think, may be said, with very little qualification, at any rate, of the pernicious or malignant intermittents and remittents, or the congestive fever of our southern and western States. It is easy to see that the comatose form of this latter disease, where the previous history of the case is not known, may sometimes be mistaken for some affection of the brain, but there can rarely, if ever, be any difficulty in distinguishing it from any of the forms of continued fever.

I have had occasion to remark, incidentally, more than once in the course of these observations on the diagnosis of fever, that the three forms of malarial or miasmatic disease, known as intermittent, remittent, and congestive fever, ought to be regarded only as forms or varieties of a single disease; and, also, that the true congestive fever of

our southern and western States is identical with the pernicious or malignant intermittents and remittents of European writers. Before leaving this part of my subject, perhaps I ought to state some of the reasons upon which this opinion is founded. I may observe, in the first place, that such is the doctrine of many of our own writers, who have had good opportunities for studying these several forms of disease; amongst whom it is sufficient to mention, Dr. Gerhard, Dr. John Bell and Dr. Stewardson of Philadelphia, and Dr. Yandell of Tennessee. There is, in many respects, a general correspondence in the symptoms of these three forms of disease. The essential elements of their symptomatology are very much the same. There is no one symptom or group of symptoms, often present in one form, which may not be present, with certain modifications and peculiarities, perhaps, in the others. The remarkable phenomenon of periodicity in the appearance, or in the increase and diminution of certain symptoms, is common to all the forms. The lesions, also, so far as these have been ascertained, are similar in the several varieties. Simple, uncomplicated, intermittent fever is very rarely fatal during its active period, so that we have no right to speak confidently as to the condition of the internal organs; but we have sufficient evidence, that the liver and spleen are the frequent seats of disordered action and of structural change. In regard to the pathology of pernicious intermittents our knowledge is more positive. Dr. Bailly, in his admirable and elaborate essay on these diseases, as they prevail

at Rome, although he does not speak particularly of the color of the liver, and although many of his histories of individual cases are not very full and circumstantial, makes constant mention of alterations of this organ, of the stomach and of the spleen. In the comatose variety of the fever, he found, also, very frequent marks of congestion of the brain. Dr. Gerhard, speaking of the lesions in this form of disease, as it occurs in our own country, in a paper published in the American Journal of the Medical Sciences, says, — "In all these cases, the glands of Peyer, as well as the other intestinal follicles, were found perfectly healthy. The large intestine was occasionally but not constantly diseased, while the stomach, and, to a still greater degree, the liver and spleen, were invariably found in a morbid condition. If the fever proved fatal in the course of the first fortnight, the liver and spleen were softened as well as enlarged; but if the disease assumed a more chronic form, the viscera were hardened as well as hypertrophied. I made numerous examinations of the bodies of patients, who died of the same variety of malignant remittent and intermittent, during the summer of 1835, and still more frequently in the summer of 1836, a year in which these diseases have been unusually fatal throughout the southern States. The results of these late examinations have confirmed those already obtained, and showed that the follicles of the small intestines are free from lesions, and that the anatomical character of the disease is to be looked for in the spleen, liver, and stomach."

Another and still more unequivocal proof of the essential identity of these three forms of fever, consists in the fact, that they are severally convertible, one into the other. A case of ordinary remittent fever is frequently changed, in the natural progress of the disease, or by the effects of remedies, into a simple intermittent; or it may pass, in the other direction, by the supervention of the *congestive element* in pathology, into a case of malignant intermittent or remittent. The three forms of disease, are also, as has already been said, often separated from each other only by undefined and almost imperceptible boundaries. What the particular modifications are, in the causes of this one disease, which, in certain seasons and places, produce the pure intermittent form of fever, in others, the remittent form, and in still others, the pernicious or congestive form, I am wholly unable to say. The latter variety seems to be more common and grave in the low and marshy portions of hot climates than it is in more temperate regions. It is a frequent disease along the rich uncultivated bottoms of our southwestern rivers, and it constitutes, I suppose, the terrible scourge of the white races amidst the tropics of Africa. All the forms of this wide spread fever vary very considerably, both in their degree of severity and in other circumstances, in different years and places. During one season they may be marked by a great predominance of the nervous or periodical element in their pathology, and during another by the frequency and violence of local,

organic congestions. All these differences, however, are mere differences of form and variety; none of them are constant and fundamental, and they are hardly greater or more striking than those which are continually met with in scarlatina, smallpox, and other diseases.

Furthermore, these three forms of fever seem to be alike dependent upon the same essential, producing cause. In regard to the nature, sources, and operation of this cause, which has been designated by the terms *marsh miasm* and *malaria*, there is no occasion that I should say anything here. It is sufficient to observe, that the presence and action of this influence, whatever it may be, appears to be necessary to the production of each and all of the three varieties of the disease under consideration, and that wherever one of these varieties is known to prevail extensively, either of the others may occur.

Finally, and as a corroboration merely of the opinion, which I am endeavoring to elucidate, the identical nature of these three forms of disease is strongly indicated, to say the least, by the similar influence upon them of the preparations of cinchona. The nature of this influence, the mode and process by which this substance so suddenly and powerfully impresses the living organization, and controls its morbid actions, it is one of the idlest of all speculations to endeavor to explain or to comprehend; but that it does exercise this special agency, in these three varieties of disease, and in each with the same

certainty and to much the same extent, is now sufficiently settled by the concurrent and almost unanimous testimony of the profession.

CHAPTER II.

YELLOW FEVER.

I have next to consider the diagnosis, and to point out the distinguishing characters of yellow fever. In order to do this clearly, and in any degree satisfactorily, it is necessary, that I should enumerate, as I have already done in regard to remittent fever, with some particularity, the principal events and circumstances, which go to make up its natural history, and to constitute it an individual and peculiar disease. It is only by pursuing this course, and by a comparison with each other of all the elements of somewhat similar diseases, that this question of their differences and resemblances can be settled; their true relations to each other ascertained, and their diagnosis established upon a solid and philosophical basis.

It is hardly possible, that there can ever be any difficulty in distinguishing between yellow fever on the one hand, and typhoid and typhus fevers, on the other. The differences between these diseases

are so numerous, and so striking, that an error of diagnosis cannot easily occur. Such, however, is not the case with remittent fever. This disease and yellow fever are made up of many similar elements; there are many pretty close analogies and resemblances between them; they have many things almost in common; and a careful and discriminating examination of their entire natural history is consequently nccessary to a clear and certain diagnosis.

I have already expressed the opinion, that yellow fever is a distinct, individual disease; possessing its own characteristics, and differing, radically, from the several forms of remittent fever. Before proceeding, however, to an exposition of the grounds upon which this opinion rests, it is but fair to state, that the opposite doctrine has been held by many distinguished and experienced observers. Dr. Rush looked upon yellow fever only as a high and malignant grade of the common bilious remittent. Dr. Bancroft took the same view of the two diseases; but, in this instance, the opinion seems to have grown, in part at least, out of the feeling, that if yellow fever was shown to be identical in its nature with the malarious remittent, it would be easier to establish its non-contagious character. Dr. Heustis, of Alabama, takes the same view of the relations of these diseases.[1] Similar opinions have been entertained by other writers; and before the intro-

[1] Amer. Jour. Med. Science, Nov. 1836.

duction of a more thorough, complete, and diagnostic study of diseases, than had previously prevailed, and during the almost universal existence of a vicious tendency to loose and premature generalizations, perhaps this was the common opinion. It was not universal, however. Dr. William Currie, in a little work published in Philadelphia, in 1798, asserts strongly and distinctly the separate and independent character of the two diseases. In speaking of their causes, he says, — "If we go down to the meadows and marshes on the flats of the Delaware and the Schuylkill, and look for it," — yellow fever, — "amongst the diseases, which exhalations engender, it is not there. *Imagination*, and her whimsical daughter, *theory*, have created something in those places, which they have called its likeness; but the *sallow imp* of the marshes is the offspring of different parents, and differs essentially in its character from the jaundiced-eyed fiend, which extends its destructive sway by contagion."[1] Dr. Dickson, of Charleston, S. C., who has had

[1] "Observations on the Causes and Cure of Remitting or Bilious Fevers," etc., Phila. 1798, p. 43. I cannot refrain from taking this opportunity of expressing my high sense of the value of this excellent and unpretending little book. I have no knowledge of the personal history or character of Dr. Currie; but the work itself contains abundant evidence of the possession, by its author, of sound practical sagacity, and a highly philosophical mind. His descriptions of disease are, to say the least of them, every way equal to those of Dr. Rush, — clear, strong, and vivid, — while they are not mixed up with the wild and fanciful speculations, which, under the old misnomer of *principles*, so continually encumber and disfigure the writings of the latter. Dr. Rush long ago had his apotheosis, but who ever hears of William Currie?

ample opportunities for the study of both forms of disease, and whose competency as an observer will hardly be questioned, is very decided in the opinion, that they are essentially unlike each other. He regards yellow fever as a disease consisting of a *single* febrile paroxysm.[1] Dr. Simons, in a Report on the History and Causes of the Yellow Fever of Charleston, S. C., advocates the same doctrine.[2]

Yellow fever usually makes its attack suddenly. Dr. Rufz, in his description of the disease, as it prevailed at Martinque, in 1838, says: "A person in good health might be seated at table, or engaged with business, and in two hours you would find him in a high fever. Or he would lie down in good health, and awake in the night with all the symptoms of the disease."[3] Occasionally, however, the access is preceded, for several days, by various uncomfortable feelings, such as chilliness, uneasiness, slight pain or heaviness of the head, loss of appetite, epigastric oppression, and so on.

The disease is almost invariably ushered in by a chill. This is generally well-marked, and of short duration. Dr. Barton, of New Orleans, says, that it often goes off in less than thirty minutes. Unlike the chill of remittent fever, it is very rarely repeated; and when this does happen, it is at no definite or regular periods. In a very small number of the cases, observed by Louis and Trousseau, at

[1] Amer. Jour. of Med. Sci. May, 1828. [2] Ibid, Feb. 1840.
[3] Medical Examiner, vol. iii. p. 54.

Gibraltar, in 1828, the chill came on several times, in the course of the first day, or was repeated during the first two or three days of the disease.[1]

The initial chill or rigor, in yellow fever, as in other acute diseases, is immediately followed by feverish heat of the skin. This heat is described by most writers as not very intense, less so, it would seem, than it is in some other diseases. In the Gibraltar epidemic of 1828, the temperature of the surface, in cases of every grade of severity, was often but moderately elevated; in many it was quite natural. It is not unusual, in fatal cases, for the extremities to become quite cold, at a period of from one to two or three days before death. The skin is generally dry, although in some cases there are sweats.

Yellowness of the surface is almost invariably present in fatal cases. Occasionally it is wanting. It is often more marked on the chest than over the rest of the body, and is sometimes confined to this region. This remarkable change in the color of the skin does not usually show itself during the first few days of the disease. Dr. Rush says, that in the great Philadelphia epidemic of 1793, the yellowness rarely came on before the third day, and commonly from the fifth to the seventh day of the fever. Of fourteen cases, occurring at Gibraltar, in 1828, and communicated to Louis, ten exhibited this appearance only on the last day of life.[1] This

[1] Louis on Yellow Fever, p. 247.

color of the skin is witnessed in only a moderate proportion of mild cases. Louis found it in about one third, or one quarter, of those which recovered, at Gibraltar.

The pulse in yellow fever is described, generally, as being full, bounding or chorded, and frequent. It is less rapid, however, than it is in typhoid and typhus fevers; and, indeed, in many other diseases of less severity. Louis and Trousseau found the pulse but moderately accelerated, even in fatal cases. It was rarely as high as a hundred, and often not more than from eighty to ninety in the minute. In patients who recovered, it was still less frequent, and it became progressively slower after the second day of the fever, passing from a hundred, or ninety, to eighty or seventy-five in the minute. The other characters of the pulse were various. In the early period of recovered cases it was generally hard and full; in fatal cases it sometimes had the same character, and at others it was small, tense, vibrating, or feeble and soft, as the case might be.[1]

The functions of the lungs would seem to be very rarely disturbed in this disease. They are not often alluded to by writers upon the subject. In the late stages of grave cases the respiration is often deep and sighing.

Pain in the head is a very prominent and almost invariable symptom in yellow fever. It is generally

[1] Louis on Yellow Fever, p. 208.

exceedingly acute and severe. Very few writers fail to speak particularly of this. One of Dr. Rush's patients said to him, "No one knows the pains of yellow fever but those who have felt them." This symptom is amongst the earliest of the disease, often the earliest. Louis says, that it was almost always the first symptom experienced by the patient.[1] It commonly continues during the first half of the disease, gradually passing off. In a few cases it persists to the close.

There are pains, corresponding in constancy and intensity to the headache, in various other parts of the body. These are most commonly seated in the back and limbs. Sometimes all the joints are painful; sometimes only the loins. In some cases these pains are confined to a single spot, as the calves of the legs, the knees, or the penis. They are often excessively severe. Dr. Rufz speaks of the pains in the lumbar region, and in the extremities, especially the lower, as often insupportable, compelling the patient to toss about continually in his bed.[2] These pains, like the headache, are usually confined to the early stage of the disease; in many cases gradually disappearing at the end of the first day.

I will pause, for a moment, in my description of yellow fever, in order to call the attention of the reader, particularly, to two circumstances, not diagnostic, by any means, of the disease; but still suf-

[1] Louis on Yellow Fever, p. 178.

[2] Med. Exam. vol. iii. p. 54.

ficiently striking to be somewhat noticeable. The first consists in the moderate degree of febrile action, even in the grave and fatal cases of the fever. This disease, in these cases at any rate, as will be seen hereafter, is attended with profound alterations of some of the most important organs of the body, some of which are evidently of an inflammatory character; these lesions are acute, and rapid in their progress; often destroying life in the course of a few days; and still the proper febrile symptoms are very far from possessing a high grade of intensity. The chill is short, slight, and rarely repeated; the heat of the surface is not excessive, sometimes natural, and rapidly falling below par, and the pulse is only moderately accelerated. The second circumstance, to which I allude, is the constancy and the severity of the local pains. These, as will be seen hereafter cannot be referred to any lesion of the parts or organs in which they are seated; but they are, nevertheless, very constant and strongly marked, presenting a striking contrast to the mildness of the febrile symptoms with which they are associated.

Grave and fatal cases are usually marked, during the latter period of the disease, by an extreme degree of general anxiety and restlessness. Patients are described as constantly turning in their beds; going from one bed to another; getting out of bed to lie upon the floor; and all this, accompanied with "pitiful sighing," as Dr. Barrington calls it, and a feeling of undefinable and insupportable distress. This condition is generally wanting in mild cases.

The mind, in a majority even of fatal cases, continues clear and unimpaired to the last. There may be, as there frequently is, anxiety, or apprehension, or despair, or indifference, but not often delirium; and when this occurs, it is generally slight, consisting of some incoherence and confusion of ideas, and it is confined, for the most part, to the last hours of life. Delirium is a very rare symptom in those who recover. The same thing is true of any thing like well marked stupor or coma, both in mild and in grave cases. This is very different from what often takes place in the congestive form of intermittent and remittent fever; a variety of this disease with which yellow fever has often been confounded.

The sleep, in cases of any considerable severity, is almost always disturbed, imperfect, broken by distressing dreams, or entirely wanting. There is nothing like the morbid drowsiness of continued fever.

The expression of the countenance is usually altered. Dr. Barton, of New Orleans, in his description of the epidemic of 1833, in that city, says, that it was nearly always anxious, although sometimes it was fierce, or despairing, or stupid, or indifferent. The face is suffused and full.

The senses, properly speaking, are, for the most part, unimpaired, during the entire course of the disease. There is very rarely any dulness of hearing, or ringing in the ears. The vision is unaffected, although the eyes are frequently somewhat pain-

ful, or unduly sensible to the light. There is, however, a condition of the eyes, which it is important to describe particularly, and which seems to have obtruded itself upon the attention of all careful observers of this disease. Dr. Rush says, that the eyes are sad, watery, and inflamed, like two balls of fire, sometimes with a brilliant, or ferocious appearance. Dr. Barton, in his account of the disease, as it prevailed at New Orleans, in 1833, characterizes this state of the eyes by the terms, *red, dull, muddy, glassy, injected.* He says, that they had a peculiar, inflamed, glossy appearance, consisting of a strange compound of muddiness and lustre.[1] This peculiar condition of the eyes was attentively studied by Louis and Trousseau, at Gibraltar, in 1828. Louis describes the redness as being "of a uniform, delicate rose tint, as if put on with a brush, often combined with a more or less marked injection of the vessels of the conjunctiva. In the cases where the redness had not disappeared at the time the yellowness came on, the mixture of yellow and red in the sclerotic was very remarkable."[2] This red, glossy, moist suffusion of the eyes occurs with great constancy, alike in the mild and in the severe cases; and it shows itself at the earliest period of the disease. Louis and Trousseau found it present on the first day, in all the cases which they saw at this period; and it was said to have been already manifest in private patients,

[1] Am. Jour. Med. Sci. November, 1834.

[2] Louis on Yellow Fever, p. 201.

at the first visit of the physician, which was usually made a few hours after the attack. This redness does not generally continue during the entire course of the disease, even in fatal cases; in such as recover, it gradually disappears after the expiration of a few days. The early appearance of this symptom, its striking and peculiar character, and the uniformity of its presence, both in grave and in light cases, of the disease, are circumstances, which combine to render it a diagnostic indication of great value.

The loss of muscular strength is sometimes great and well marked in yellow fever; but its preservation, in many instances, up to the agony of dissolution, constitutes a much more striking feature of the disease. The debility, when it is present, even in fatal cases, is said to be often greater at the commencement than at a subsequent period of the fever. Patients are frequently described as going from one place to another in their rooms; sitting up at stool; and holding, themselves, the vessel during the act of vomiting, even to the last hours of life. Dr. Barrington says: "Muscular strength is often retained to the last moment; and it is not unusual to see a patient rise from his bed, make some violent exertion, lie down and quietly expire."[1] Spasmodic contractions of the muscles are never noticed, so far as I know, except those of the diaphragm, constituting hiccup, and occurring in a certain

[1] Am. Jour. Med. Sci., August, 1833.

proportion of fatal cases, near to their termination.

The tongue is most commonly covered with a white, moist, villous coat, while its edges are florid. Sometimes, after the first two or three days, and in severe cases, it becomes red and glossy; and towards the close of life, a dry brown or black streak occasionally appears along its middle, gradually extending over its surface. The teeth are not often covered with true sordes, although a dark, dry crust of blood is sometimes spread over them and the lips. Many writers speak of frequent hemorrhages from the gums and tongue, especially in the late period of grave cases. There is reason to think, that this accident has often depended upon the effects of mercurials.

The appetite for food, as is the case in most acute diseases, is wanting. I do not know, that there is any thing peculiar to yellow fever in connection with this symptom. Dr. Barrington, in his account of the disease, as it occurred in the United States naval service, in 1828, 1829 and 1830, says, that in some cases there was a strong desire to eat shortly before death.[1] Dr. Rush says, that the appetite is often voracious, immediately after recovery. Thirst does not seem to be so urgent and uniform a symptom, as might, from *à priori* considerations, have been expected. Dr. Rufz says, that at Martinique, in 1838, a disgust for drinks was more

[1] Am. Jour. Med. Sci., August, 1833.

frequent than great thirst, and that where this symptom was present at the commencement, it generally declined with the progress of the disease.[1] Not unfrequently, however, there is a craving desire for cold drinks. This was very constant, according to Dr. Barton, at New Orleans, in 1833. One of Dr. Rush's patients exclaimed, just before he died, that he could drink up the Delaware.

The purely gastric symptoms are very constant in this disease, and in fatal cases, especially, very characteristic. These consist of nausea and vomiting. Vomiting is almost invariably present. In a certain proportion of cases it commences on the first day, but in a majority of instances it comes on from the second to the fifth day of the fever. Louis and Trousseau found, that in cases which terminated favorably, the vomitings were not often repeated for successive days; and that they rarely continued during a period of more than twenty-four hours; while in cases of an opposite description the vomitings, after they had commenced, were often repeated, from day to day, to the fatal close of the disease. The matter ejected from the stomach was usually yellowish or greenish, in patients who recovered; while in those who died, it was at first clear, then more or less yellowish, and, finally, blackish, or completely black, constituting the dreaded and fatal *black vomit* of yellow fever. This matter, whether entirely black, or of a reddish brown color,

[1] Medical Examiner, vol. iii. p. 54.

and whether expelled from the stomach during life, or removed from it after death, presented different degrees of consistence, from that of porridge to that of entire liquidity; and it separated, on standing, into two parts; the upper, abundant, fluid, and of a bistre color; the lower, less abundant, more consistent, and consisting of blackish parcels.[1] The vomiting of this matter does not come on, in many cases, until the last day of life; and recovery, after its occurrence, is exceedingly infrequent, except in cases of children. Dr. Ashbel Smith says, that he has never seen any thing vomited, in the congestive fever and other climatic diseases of Texas, which could be mistaken for the black vomit of yellow fever.[2]

Spontaneous diarrhœa is very rarely present at any period of yellow fever. The only important peculiarity in the character of the stools consists in their brownish or blackish color in a certain proportion of cases. This has been particularly described by Louis and Trousseau. They found the dejections of this color in twenty of twenty-five fatal cases. They did not often appear until near the termination of the disease. Their appearance sometimes preceded, for a short time, that of the black vomit, but more frequently followed it. The stools were of the same color in a small proportion of the cases which recovered.[3]

[1] Louis on Yellow Fever, p. 81.
[2] Am. Jour. of Med. Sci., February, 1840.
[3] Louis on Yellow Fever, p. 231, *et seq.*

Most writers on yellow fever agree in stating, that the epigastrium is very commonly the seat of tenderness and pain. Dr. Barton found it generally tense as well as painful. Louis and Trousseau found it painful, and this, generally, independent of pressure, in all their fatal cases, where the epigastrium was sufficiently examined. In a majority of instances the pain was present as early as the first day; in others it came on between the second and fourth days of the disease. Many patients, who recovered, presented, also, the same symptom.

The abdomen almost always preserves its natural shape, and is rarely tender on pressure. In a considerable number of the cases reported by Louis and Trousseau, there were some colicky pains, the commencement of which was, in several instances, observed to correspond to the appearance of the black or brown fecal discharges.

The testimony of different observers differs somewhat in regard to the character of the urine. It does not seem to undergo any very constant or important changes. In Dr. Harris's cases, occurring in 1833, at New Orleans, it is described as being mostly of a deep red color, depositing a lateritious sediment. In the epidemic of 1828, at Gibraltar, the urine was not remarkable as to its color, and was suppressed in only a few instances.[1]

Dr. Rush speaks of the activity of the sexual appetite after recovery. Dr. Barrington says, that

[1] Louis on Yellow Fever, p. 235.

"an itching of the genitals, and a constant rubbing or pulling at them, was observed in nearly all the fatal cases on board the Hornet, and in several of those of the Grampus and Peacock.[1] Obscene remarks, and a desire for coition were also not uncommon."

Many of the historians of yellow fever mention hemorrhages from various parts of the body, as of frequent occurrence. Dr. Rush says, that they were very common at Philadelphia, from the nose, uterus, gums, ears, stomach, bowels, and, in some instances, from healed lancet cuts in the arm. I have already spoken of the frequency of black vomit, and of the dark, or black stools; but, although the matter discharged, both from the stomach and bowels probably consists partly of altered blood, still the occurrence, in neither case, can properly be called a hemorrhage.

Looking now at the symptomatology alone of yellow fever, as it is presented to us in the foregoing pages; and comparing it with that of remittent fever; which is the most reasonable and philosophical conclusion; that these affections are essentially distinct and separate diseases, or that they constitute varieties, merely, of one and the same disease? In order to answer this question satisfactorily, let us briefly recapitulate the principal circumstances in regard to which the two diseases or forms of disease agree with and differ from each other. There are

[1] Am. Jour. of Med. Sci. August, 1833.

no differences, then, of sufficient constancy or importance to be of any value as diagnostic considerations, in any of the following circumstances or symptoms, to wit: the mode of access in the two diseases; the chills, the febrile heat, the pulse, the thirst, and the appetite; the condition of the respiratory functions, and the state of the urine. The febrile symptoms, however, are less distinctly remittent, or paroxysmal, in yellow fever, than in remittent fever. Dr. Rush, it is true, says that the remissions in the former disease, occurring generally in the forenoon, are more evident than they are in common bilious fever; and other writers speak of a *false remission*, or *period of repose*, towards the third day of the disease. But it does not appear, that there is in yellow fever anything like the quotidian or tertian paroxysm and remission which so generally characterize the several forms of remittent fever. Dr. Rufz, in speaking of the yellow fever of Martinique, in 1838, says, that there were no intermissions, and that the exacerbations were hardly perceptible.[1] The yellow discoloration of the skin, in fatal cases of yellow fever, is more constant, and more strongly marked than in those of remittent fever. The headache would seem to be somewhat more intense, while acute local pains in various parts of the body are more common, and the general restlessness is more distressing in the former than in the latter disease. There is not often any consid-

[1] Med. Exam. vol. iii. p 54.

erable degree of delirium in either of the diseases, but stupor and coma are more frequent in the high grades and in the congestive form of remittent than they are are in yellow fever. The early and almost invariable red suffusion of the eyes constitutes a peculiar and very characteristic symptom of the latter disease. The great preservation of muscular strength, even up to the close of life, which is often so striking a phenomenon in yellow fever, does not appear to be common in remittent. Although the symptoms connected with the digestive apparatus are very constant and prominent in both diseases, they are far from presenting the same characters in each. To say nothing of the state of the tongue, which does not appear to be precisely the same in both fevers, there are very marked differences in relation to the vomiting. In remittent fever this is generally one of the earliest symptoms, showing itself often on the first day of the disease. This is the case, also, not unfrequently, in yellow fever, but in a large proportion of instances, vomiting is not present till a later period, and in many fatal cases it does not appear until within the last day or two of life. Besides this, there is the striking peculiarity of the matter vomited, at least in a large proportion of the fatal cases of yellow fever, consisting of the dark or black liquid, which has already been described, and which is rarely witnessed in the course of remittent fever. Although the stools in the latter disease are frequently variously colored, especially after the use of mercurial cathartics, I

am not aware, that they often have that peculiar black shade, which they present in many cases of yellow fever, which are attended by the black vomit. Finally, pain and tenderness of the epigastrium are very uniformly present in both diseases, but the tension and fulness from one hypochondrium to the other, with the pain and soreness over the region of the spleen, which have been especially noticed by Dr. Stewardson, in remittent fever, seem to be less strongly marked, and have at least excited less attention in yellow fever.

It may be too much, perhaps, in the present state of our knowledge to say, that the differences, just enumerated, between these two diseases, or forms of disease, are sufficiently fixed and fundamental, to settle definitively, and without taking into consideration other points in the natural history of the affections, the question before us. It can hardly be denied, however, that these differences are so numerous and marked as to give a very dissimilar physiognomy to the two fevers. I do not pretend, that in either of them we find anything like what has been called a pathognomonic symptom. Such symptoms are exceedingly rare anywhere in medicine. Any single physical sign even, depending directly upon the physical condition of an organ, is not often, when taken by itself, and apart from its connection with other signs or symptoms, strictly and positively pathognomonic. In the case before us, as in all others of a similar nature, it is only by comparing with each other *all* the symptoms of the

two related diseases, that the question of their diagnosis, so far as this depends upon their symptomatology, can be satisfactorily and philosophically settled. If many of these symptoms are found to differ, and that with considerable uniformity, not in degree, merely, but in their character; in their combinations; in their duration and progress; we are at least bound to suspend our judgments, and to let their final decisions depend upon the evidence, which we may derive from an examination of the other elements, which go to constitute the diseases. So in the present instance, I am disposed to leave the question of the essential similarity or dissimilarity of remittent and of yellow fever, of their true relations to each other, to be decided by circumstances connected with their pathology, their duration, their causes, and so on. If these are found to differ in several important particulars, and with a very constant uniformity; if the two diseases can, in most cases, be easily distinguished during life; if they are not convertible, never passing mutually into each other; then, certainly, notwithstanding their numerous and strong points of resemblance, we must regard them as distinct and individual diseases. If, on the other hand, these differences are merely differences of degree or of frequency; none of them constant; none of them important; if the two diseases or forms of disease, are not readily distinguishable; if they commonly prevail together, produced apparently by the same causes; running into each other by imperceptible gradations, and mutually

convertible ; then we are bound to regard them as mere forms or varieties of a single disease. I do not know any other means or principles of diagnosis than these.

The condition of the organs, after death from yellow fever, was never fully and accurately investigated, until this investigation was made by Louis and Trousseau, at Gibraltar, in 1828. In the latter part of the last century, Dr. Physick, in Philadelphia, and Dr. Chisholm, in the West Indies, examined, very partially and imperfectly, as such examinations were then generally made, the bodies of a small number of patients dying with this disease. Subsequent researches, of the same character, had been instituted, by different observers in different places, but none of them had been conducted with a sufficient degree of care and completeness, or by men familiar enough with the appearances of diseased organs, in other affections, to justify us in placing entire confidence in their conclusions. The publication of the work of Louis, for which we are directly indebted to Dr. G. C. Shattuck, Jr. of Boston, one of the many friends and pupils of that distinguished observer, whom we have the honor to count amongst our countrymen, has filled up an important interval in the natural history of this disease. In the account, which I shall now give of the condition of the organs after death, from yellow fever, so far as this is necessary to a clear diagnosis of the disease, and to a knowledge of its own distinctive pathological character, I shall rely very much upon

the authority of this work. I do not forget, in doing this, that the conclusions of Louis and Trousseau are derived from the study of a single epidemic; and I admit, that these conclusions must be looked upon, for the present, as provisional only, and not absolute or final. There are strong grounds, however, for believing, that they will be confirmed and established by future observations. The disease to which they relate, like most other affections, in any degree subject to those unknown influences, which we call *epidemic*, varies, very considerably, in some of its phenomena, in different seasons and localities; but these variations may properly be considered as wholly unessential; they do not touch the fundamental character of the disease, which preserves, under all circumstances, and with great constancy, its strongly marked and peculiar physiognomy. Besides, so far as recent researches have been made, by qualified observers, they go to confirm, generally, the results obtained by Louis and Trousseau. These results, I may remark, were derived from an examination of twenty-three bodies.

The yellowness of the skin, already mentioned as a frequent but not an invariable symptom, continues very manifest after death. It was present in all the cases, examined by Louis and Trousseau, except three. When the yellowness was not well marked, it was more distinct upon the trunk and about the head, than upon the limbs. There was great cadaveric rigidity, even in a few hours after

death, and before the subjects were perfectly cold. The muscles had their natural color, firmness and cohesion.[1]

There was no important alteration in the central organs of the circulation, except flaccidity and softening of the heart in nearly two-thirds of the cases. The substance of the lungs, in many cases, was the seat of a peculiar morbid appearance. This was occasioned by the presence of black spots of from two to five lines in diameter, or masses of the same color more or less impermeable to the air. The spots were found in nine subjects. The black or blackish masses existed in six individuals. They contained no air, were not granulated, and presented but slight traces of organization. "Usually they could be easily broken down; in some cases they yielded by pressure the blood of which they were almost entirely composed, and the pulmonary parenchyma remained apparently of its natural consistence."[2] There was no distinct line of demarcation between them and the sound pulmonary tissue. Other lesions of the lungs were very rarely met with. The air passages presented a livid color, more or less marked, in several cases.

Slight or moderate serous effusion, into the cavity of the arachnoid, or between this membrane and the pia mater, or into the ventricles of the brain, was generally present. The fluid was nearly always clear and limpid; in a few instances it was

[1] Louis on Yellow Fever, p. 53. [2] Ibid, p 65.

slightly yellowish or bloody. The pia mater was moderately injected in six cases. The cortical substance of the brain had a pale or a light red, or a violet or lilac color in eight cases. The medullary substance was almost constantly healthy. These slight lesions, together with like unimportant ones, found in the spinal canal, cannot be regarded as in any way peculiar to this disease. They are often found in other affections.

The morbid appearances, which present themselves within the cavity of the abdomen, are very important, and, in more respects than one, very characteristic of this disease. The prominence and severity of the gastric symptoms very naturally called the attention of physicians, long ago, to the state of the stomach after death. Dr. Physick found it exhibiting evident traces of inflammation. Dr. Barton, of New Orleans, says, that the mucous membrane of this organ, and of the duodenum, is always inflamed. We are indebted, however, to the investigations of Louis and Trousseau, for a complete history of the alterations, which are found in the abdominal cavity; some of which, and amongst them those which are most peculiar to the disease, had not before been particularly described.

I shall first speak of the contents of the stomach. This organ nearly always contained a blackish or black fluid, in a few cases more or less deeply tinged with a red color. This liquid constituted the matter of the black vomit, and has been already described. Its quantity varied from four to twenty

ounces, and it was abundant in proportion to the depth and blackness of its color. The mean quantity, where it was of a bright red color, was nine ounces, while it was fourteen ounces in cases where the matter was entirely black. Once, only, and this in a case where the stomach contained a red liquid, was the matter mixed with any clots of blood. Vessels in which it was held, and bodies plunged into it, even when it was black and pultaceous, were stained red. Louis seems to regard this matter as the product of a peculiar secretory irritation of the mucous membrane of the stomach, often associated with inflammation, but not necessarily and essentially dependent upon this morbid process. In proof of this latter opinion, he cites a certain number of cases, in which the black or reddish matter was contained in the stomach, but where the mucous membrane of this organ presented no appreciable alteration of an inflammatory character. He remarks, also, that gastritis, occurring, as it often does, in the course of other diseases, is very rarely attended with this peculiar exhalation.

The mucous membrane, however, was found more or less changed in nearly every case. In five instances, only, were these changes confined to slight modifications of its natural color. In most of the others it was more or less deeply and extensively reddened. The thickness of the membrane was either increased, or diminished, in a majority of the cases. The increase of its thickness was

much more common than its diminution. These changes were generally more or less limited in their extent, and sometimes they were combined in the same subject. The consistence of the gastric mucous membrane was nearly always diminished. This softening was sometimes general, but more frequently partial, and it was never carried to an extreme degree, so as to render the tissue pulpy. In two-thirds of the cases the membrane was mamelonated, and this to a remarkable degree. This alteration occupied different portions of the stomach, but it did not often extend to its whole surface. It was always combined with softening or thickening of the membrane, or with both these alterations. Most of these changes, if we except slight variations of color, must be regarded as the results and as evidences of preceding inflammation. Dr. Ashbel Smith found in all his seven cases, examined at Galveston, in 1839, the mucous membrane of the stomach, more or less extensively, thickened and softened, mamelonated, and of a dull, pearl, whitish color. The surface of the membrane, thus altered, was always covered with the adherent dark colored flocculi of the matter of black vomit. In four cases, the cardiac portion of the membrane was reddened, but not softened. Dr. Smith looks upon the condition of the mucous membrane above described as the result of an intense sanguineous engorgement, differing in its nature from common inflammation.[1]

[1] Amer. Jour. Med. Science, Feb. 1840.

The mucous membrane of the duodenum, was found by Louis more or less reddened in a majority of instances, and in a certain proportion of cases its consistence was diminished. The indications of previous inflammation were much less frequent and positive here than in the stomach.

The small intestine, including the duodenum, contained, in fifteen subjects, the same kind of reddish black, or black liquid, that existed in the stomach. It was found throughout the whole length of the intestine in a few instances; more frequently it was confined to the superior portion. In all cases, except two, the stomach contained similar matter. Louis thinks, that this liquid, found in the intestines, is usually derived from the stomach; but that, sometimes, as in the two cases, just mentioned, it is furnished directly from the mucous surface of the bowels. This surface was slightly injected, or red at intervals, near the termination of the ileum, in a considerable number of cases; but alterations of its thickness and consistence, the effects of inflammation, were no more frequent than they are after death from many other acute diseases. In only one subject was there any lesion of Peyer's patches; and even in this case, that of a child, there was merely slight tumefaction of some of the plates near the cœcum.

The large intestine contained, in many cases, the same peculiar matter that was so often found in the superior portions of the digestive tube. In one instance only did the colon contain this liquid,

when it was not present either in the small intestine or the stomach. The consistence of the mucous membrane of the large intestine was diminished, more or less, in a majority of subjects. Dr. Ashbel Smith found the black matter in the stomach and intestines of all the cases which he examined.

The liver was invariably the seat of a remarkable lesion, consisting in a peculiar and striking alteration of its natural color. This color is described by Louis as being sometimes that of fresh butter; sometimes that of straw; sometimes that of coffee and milk; sometimes as a yellowish gum color, or a mustard color, or the color of sole leather, or, finally, as an orange color. This change of color extended, in most cases, throughout the whole substance of the organ, although it was more marked and uniform in the left than in the right lobe. In three subjects the right lobe preserved its natural color throughout, or in its obtuse edge only. With this discoloration of the liver there was also a more or less marked paleness, and dryness; the tissue of the organ did not contain its usual quantity of blood.

This discoloration of the liver seems not entirely to have escaped the notice of one at least amongst former observers. Dr. Chisholm, in his account of a small number of examinations, made during the prevalence of the yellow fever, in the West Indies, in 1793, and the immediately subsequent years, speaks of the liver as being "*of a color nearly approaching to buff, or a mixture of yellow and that of*

ashes." This same appearance has since been witnessed by Dr. Rufz at Martinique. Dr. Palloni, also, in an account of the yellow fever at Leghorn, in 1804, says, " the external surface of the stomach, liver and intestines, had a livid yellow color." He speaks of the inside of the liver looking as though it had been boiled.[1] In September, 1841, a patient was received into the Pennsylvania Hospital, having arrived at Philadelphia the same day, in a brig direct from New Orleans, where yellow fever was then extensively prevalent. He had been ill nine days with what the mate considered as yellow fever. On the 5th of September one of the crew had died after an illness of five days, apparently with the same disease. The patient died on the day after his reception; and the liver, which, through the kindness of Dr. Stewardson, I was enabled to see, presented, in a very manifest and striking degree, the appearances, which have just been described. The color, throughout its whole extent, was like that of powdered gamboge or yellow ochre. The stomach and intestines contained a moderate quantity of fluid rather more consistent than water, of a bluish black color.[2] Perhaps it would be somewhat premature to regard this peculiar change of the liver as positively invariable, and so constituting the essential anatomical characteristic of yellow fever. Dr. Ashbel Smith, in an interesting account of the

[1] Edin. Med. and Surg. Journ. vol. ii. p 86.

[2] Amer. Jour. of Med. Science, Jan. 1842.

disease, as it prevailed in the city of Galveston, Texas, in 1839, says, that of seven autopsies, only three presented a light drab color of the liver, internally and externally. He thinks, however, that, in all, the biliary secretion was suspended.[1]

The nature of this alteration of the liver must be, of course, in the present state of our knowledge, a matter of speculation. The most that we are justified in saying seems to be this, that the condition, of which I am speaking, possesses none of the characters of ordinary inflammation; and, that it appears to consist, in some special morbid alteration, and to depend upon some peculiar cause, with the nature of neither of which are we at all acquainted.

In three cases, observed by Louis and Trousseau, the firmness of the liver was somewhat increased; in five it was diminished. Very little bile was found in the stomach and small intestines; that contained in the gall bladder was scanty, thick, and of a dark green color. The biliary ducts were free, and their mucous lining quite healthy. The spleen was in a perfectly natural condition, as to volume, cohesion and firmness, in half the cases. It was slightly increased in size, without any alteration of its consistence, in five cases. In eight it was softened, but in only one of them to any considerable extent. The kidneys were unaltered in a majority of the subjects. In a few cases they were

[1] Amer. Jour. of Med. Science, Feb. 1840.

softened; in a few they were of a yellowish, and in one of a livid red color.[1]

Let us now compare the anatomical lesions of yellow fever with those that are found in remittent fever, in reference to the question of the real relations between these two diseases. The alterations of the brain are alike slight and unessential in both diseases. The state of the blood has not been ascertained with sufficient accuracy to render it of any service in diagnosis. There is no important difference in the changes of the mucous membrane of the stomach, in the two fevers; and in both, at least in a very large majority of cases, there are indubitable evidences of preceding inflammation. The differences in the state of the mucous membrane of the intestines are not constant and considerable enough to require any notice here. The substance of the lungs, in a moderate proportion of cases of yellow fever, presents a peculiar lesion, which, so far as I know, has never been observed in remittent fever; and which is, indeed, an exceedingly rare occurrence in any other disease. The contents of the stomach and intestines, in yellow fever, differ very constantly and strikingly from those of the same organs in remittent fever. The most invariable and important differences, however, are to be found in the condition of the liver and spleen. The liver in remittent fever is commonly softened, and of a bronze or olive gray color; in

[2] Louis on Yellow Fever, p. 142.

yellow fever, it is destitute of its usual quantity of blood, and of a bright yellow color. The contents of the gall bladder, in the former disease, are usually abundant, fluid, and of a light color; while in the latter they are scanty, dark colored and consistent. The differences in the condition of the spleen, in the two diseases, are hardly less constant or striking. In half the subjects of yellow fever it is quite natural, in all respects; in some it is slightly altered in volume or consistence; while in remittent fever, it is found invariably very much enlarged, or softened, or both.

The conclusion, then, which the study of the symptoms alone of these two affections, might, perhaps, have justified us in forming, that the two diseases are radically and essentially dissimilar, is strengthened and confirmed, by this comparison of their anatomical lesions.

I cannot refrain from making a remark here in regard to the relative value and importance of the symptoms alone, on the one hand, and of the lesions alone, on the other, in determining the character and diagnosis of diseases. What I wish to say is this, that in most cases, we are in the habit of relying more confidently and exclusively upon the anatomical lesions, as a means and standard of positive nosological diagnosis, than upon the symptoms; and this is true, not only of local but of general diseases, in which there is any such appreciable lesion. Let us look, for instance, at the eruptive fevers. Our diagnosis of scarlatina rests, almost entirely,

upon the affection of the throat, and the cutaneous efflorescence; that of small pox depends, in like manner, upon the eruption on the surface, or, in other words, upon the characteristic anatomical lesion of the disease. The symptomatic expression of these diseases may be exceedingly various, in different cases; but notwithstanding this, and sometimes in opposition almost to the symptoms, regardless of them, at any rate, if we find this peculiar feature of the disease, this pathognomonic lesion, the efflorescence in one case, and the pustular eruption in the other, we have no hesitation, whatever, in our diagnosis. Now, if this mode of procedure is sound and philosophical, in the instances which I have cited, why is it less so in other cases, wherein the anatomical lesion happens to be seated in some of the internal organs, so that it is not recognizable during life? If the internal lesion is really as invariable, and consequently as characteristic as the external lesion is, it is difficult to see how there can be any difference between them, as to their diagnostic value.

I shall not enter into a detailed consideration of the causes of yellow fever; my purpose here being not to give a full and formal history of the disease, but to ascertain, as far as the present state of science will enable me to do this, its diagnostic characters, and its relations to other forms of fever, and especially to the bilious remittent. The only points in its etiology, bearing directly upon this subject, are those which refer to the influence of contagion, and of locality, in its production.

There are few questions, connected with medical science, which have occasioned more discussion than that of the contagious or non-contagious qualities of yellow fever. A strong and acrimonious controversy upon this subject commenced with the alleged introduction of the disease from Bulam, on the coast of Africa, into Grenada, in the ship Hankey, in the year 1793; and was carried on, for a long period, on the side of the contagionists, especially by Dr. Chisholm, Mr. Pym, and Sir James Fellowes, and on that of the non-contagionists by Dr. Bancroft amongst Europeans, and by Dr. Rush and Dr. Edward Miller, of New York, amongst our own countrymen. Dr. Hosack, who adopted the doctrine of modified, or contingent contagion, says, in his beautiful, biographical notice of Dr. Miller, that Miller and Rush are acknowledged to have been the most zealous and successful advocates of the doctrine of the domestic origin of yellow fever; and he adds,

——— si Pergama dextrâ
Defendi possent, etiam hâc defensa fuissent.

This protracted discussion resulted in the establishment of the opinion, which is now almost universally entertained, that the disease is not susceptible of direct transmission, in a pure atmosphere, and under ordinary circumstances, from one individual to another. There is another point, however, connected with this subject, in which yellow fever differs from remittent. There is very strong

evidence, that the unknown poison of yellow fever, wherever and in what way soever it may be generated, is capable of being carried, in the holds of ships, and in close chests of clothing, from one place to another; and of giving rise to the disease after its removal from the place of its origin. Even Dr. Rush mentions one case, in which an individual in Philadelphia apparently received the disease directly from a chest of unwashed clothes, which had belonged to a person, who had died of yellow fever in Barbadoes. A case similar to this occurred in Boston. The existence of this property in the poison of yellow fever has been quite recently advocated and illustrated with much force and ability, by Dr. John W. Monette, of Mississippi, in a paper contained in the Louisville Journal of Medicine and Surgery. There is no reason, whatever, to suppose, that any similar power is ever manifested by the malarious poison of remittent fever.

There is a very striking circumstance, in connection with the influence of locality in the production of yellow fever, in which the disease differs from the bilious remittent. Yellow fever is almost exclusively confined to cities. It very rarely, if ever, prevails to any considerable extent, except in the commercial cities of warm climates. It is not a disease of the country. Very evidently, then, it is not a disease occasioned by the unknown miasmatic poison of remittent fever. If its cause is identical in nature with that of the latter disease, differing from it only in the activity and intensity of its action on

the living system, yellow fever ought to be found frequently prevailing throughout those wide-spread rural regions, in both hemispheres, which constitute the endemic localities of remittent fever. This is not the case. Dr. Dickson, of Charleston, S. C., informs us, that while intermittents and bilious remittents are not very common in the city, they prevail extensively and fiercely in the neighboring country. "The coincident prevalence of the two forms of fever is rare," he says, "as has indeed been already observed by Rush and by Irvine. We have frequently had the yellow fever existing as an epidemic in our city, when the surrounding country was even more healthy than in ordinary seasons." [1]

Again, yellow fever differs from remittent in the almost absolute immunity from a second attack, which its occurrence confers on the individual. This immunity has long been noticed. Physicians, who had seen the disease extensively, both in Europe and America, had observed, that they were very rarely, if ever, called upon to attend a patient with it, for the second time. If any doubts, however, existed as to the extent and certainty of this preservative influence of a first attack, they have been entirely removed by the very accurate and thorough examination of the question, which was made at Gibraltar, in 1828. After the subsidence of the epidemic, a commission was established, at the instance of Sir William Pym, by

[1] Amer. Jour. of Med. Sci. May, 1828.

General Don, of thirteen individuals, consisting of English, French, and Spanish physicians. The commission inquired, in the first place, if an individual, who had had the disease in Europe, might suffer from a second attack in Europe; and, in the second place, if an individual, who had the disease in Europe, might suffer from a second attack in America, and vice-versa. In relation to the first point, thirty-three civil and military medical men of Gibraltar appeared before the commission. As nearly as could be estimated, the number of patients, seen and treated by them all, for yellow fever, in Europe and America, but mostly in Spain, during previous epidemics, amounted to about twenty-seven thousand. Mr. Amiel, surgeon of the twelfth regiment, who had seen the Gibraltar epidemics of 1810, 1813, 1814, and 1828, presented to the consideration of the commission *two* cases of presumed double attack. *Eleven* other similar cases were furnished to the commission, by other physicians. The commission thus had to deliberate on *thirteen* cases, and each of the members expressed his opinion by a vote, writing on a piece of paper, *evident*, *probable*, *doubtful*, or *inadmissible*, for each case. In this manner *one* case was declared *evident*, *three* were regarded as *probable*, and the others as *doubtful* or *inadmissible*. Supposing that one-third of the whole number of patients had been exposed, a second time, to the causes of the disease, this would give only one well authenticated case of

double occurrence in nine thousand exposures; and, admitting all the supposed instances, they would amount to only thirteen. So strong was this conviction of the preservative power of a first attack, that physicians and others, at Gibraltar, in 1828, exposed their children to those influences, which, in their opinion, would most probably bring on the disease; because, at that time, it was milder and less fatal in infancy than at a later period of life. The protection furnished by slight previous attacks is as perfect as that which is afforded by those of a severe character; and it does not appear to be destroyed by time. In relation to the second inquiry, the conclusions of the commission are the same, although they do not rest on such overwhelming and incontestable evidence.

The influence of acclimation, or a prolonged residence in the localities where yellow fever prevails, is more evident and powerful in destroying the susceptibility to the disease, than any similar influence in connection with remittent fever.

Finally, the average duration of yellow fever is much less than that of remittent. We have already seen, that the latter disease generally continues for a fortnight. The former, on the other hand, whether terminating favorably or unfavorably, runs its course with great rapidity. The largest number of deaths take place from the fifth to the seventh day, inclusive; and the question of life or death, in the disease, is generally settled within the first

week. There is no disease, perhaps, of extensive prevalence, which terminates so speedily, except Asiatic cholera, and epidemic puerperal fever.

These two diseases, then — yellow fever and remittent fever — differ from each other, in their symptoms; in their lesions; in their causes; in the immunity from a second attack, which is conferred by the occurrence of the former; in the preservative powers of acclimation; and in duration. They are separate, individual diseases; each having its own characteristics; each, in most cases, easily distinguishable from the other; and each, in its several varieties, requiring its own mode of management.

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"In bringing out a Third Edition of the present work, my first impulse is, to express my great satisfaction at the very favourable reception which this humble contribution to Surgical Literature has universally met with. The rapid sale of two large editions in England, and the republication of the work in America, lead me to believe that I have been successful in attaining the objects which I set before myself in writing it; those objects being to produce as complete a system as possible of Surgical Science and Practice, in the smallest practicable compass; to be biassed—where matters are disputed—neither by name, school, nor party; but to collect facts and opinions from every attainable source. to compare and weigh them carefully, and to state the result with conscientious impartiality; and lastly, to lay down no rules for practice which were not amply tested by experience, or which were without the recommendation of some sound British authority.

"The present edition is about fifty pages longer than its predecessor. But the additions are solely confined to the practical departments, whilst those chapters which treat of theory, or pathological principles, are rendered somewhat shorter than before.

"With respect to the sources from which the materials are gathered, I may say that I have taken as a foundation those doctrines which the present generation has inherited from JOHN HUNTER, POTT, B. GOOCH, J. BELL, and the other great masters of the latter end of the last century. The main body of the work is supplied by the labours of ASTLEY COOPER, ABERNETHY, TRAVERS, LAW-

RENCE, GUTHRIE, and the other great surgeons of our own times; nor must the writings of LISTON, HERBERT MAYO, SAMUEL COOPER, SIR CHARLES BELL, nor the admirable course of Lectures delivered at King's College by JOSEPH HENRY GREEN be omitted; but most deeply, indeed, am I indebted to SIR B. BRODIE'S masterly contributions to almost every department of Surgery. My pages will also be found to contain many references to Professor Fergusson's excellent 'Practical Surgery,' in which I believe the art of Operative Surgery to be, in most points, carried to the highest possible pitch of simplicity and refinement."

This edition has been materially improved in its appearance, so as to correspond with the edition of "Fergusson's Operative Surgery," "Wilson's Anatomy," "Churchill's Midwifery," and "Carpenter's Physiology;" and the number of the cuts have been increased, as will be perceived by the following list. It has been introduced into many Colleges as a Text Book, in connection with Fergusson's Surgery.

LIST OF WOOD CUTS
IN DRUITT'S SURGERY.

FIG.

1 Fibrine as seen under the microscope.
2. Pus globules as seen under the microscope.
3. Mucous pus as seen under the microscope.
4. Softening of the brain, showing the granules mixed with broken nerve tubes.
5. Roller bandage applied to foot and leg.
6. Miliary tubercle as seen under the microscope.
7. Malignant growths, showing the granules and nucleated cells of which they are composed.
8. Interrupted suture.
9. Twisted suture.
10. Quilled suture
11. Syphilitic caries of cranium.
12. Apparatus for treatment of rupture of tendo-achillis.
13. Ganglion formed by the synovial sheath of the flexor tendon of a finger.
14. Chronic inflammation of bone.
15. Abscess of bone.
16. Necrosis.
17, 18. Caries.
19. Osteo sarcoma of femur.
20 Fractured bone, united.
21. Bandage for fracture of the lower jaw.
22. Stellate or figure of 8 bandage for fracture of clavicle.
23. Clavicle bandage.
24. Fracture of neck of scapula.
25. Fracture of acromion.
26. Fracture of surgical neck of the humerus.
27. Fracture of surgical neck of the humerus united.
28. Fracture of the head of the humerus, with dislocation forwards, under the pectoral muscle.
29. Fracture of the lower extremity of the humerus.
30. Fracture of the internal condyle of the humerus.
31. Fracture of the external condyle of the humerus.

FIG.

32. Fracture of the external condyle of the humerus within the capsular ligament.
33. Fracture of the olecranon.
34. Fracture of coronoid process of ulna.
35. Fracture of lower extremity of radius.
36. Fracture and dislocation of bones of the pelvis.
37. Descent of the neck of the thigh-bone in advanced life.
38. Changes incident to the neck of the thigh-bone in old age, and which might be mistaken for united fracture.
39, 40. Fracture of neck of the thigh-bone internal to the capsule.
41. Fracture of the neck of the thigh-bone external to capsule.
42. Liston's splint for fracture of femur.
43. Apparatus for fracture of neck of femur applied.
44, 45. Oblique fracture through the great trochanter.
46. Fracture of the femur just below the trochanters, showing the extreme shortening and hideous projection forwards, which is the consequence of ill treatment.
47. Fracture of the shaft of the femur, showing the influence of the psoas and iliacus in tilting the upper fragment forwards.
48. Fracture of the condyles of the femur into the knee-joint.
49. Bandage for fractured patella.
50. Fractured patella, ligamentous union.
51. Tailed bandage for fracture of the leg.
52. Macintyre's leg splint for fractured leg.
53. The same applied.
54. Dupuytren's splint and bandage for fracture of internal malleolus.
55. Disease of the hip-joint.
56. Disease of the hip-joint, advanced to a destruction of the acetabulum and capsular ligament, and dislocation of the bone upwards.
57. Dislocation of the jaw.

Wood Cuts in Druitt's Surgery.

FIG.

58. Dislocation of the sternal extremity of the clavicle, and dislocation forwards of the shoulder-joint on the left side; and dislocation of the acrominal end of the clavicle with dislocation of the shoulder downwards on the right side.
59, 60. Dislocation of the humerus into the axilla.
61, 62. Dislocation of the humerus forwards.
63. Dislocation of the humerus upon the dorsum scapulæ.
64. do. do. do. do.
65. Partial dislocation of the humerus upwards.
66. Method of reducing luxation of the humerus into the axilla, by pulleys.
67. do. do. do. do. by the heel in the axilla.
68. do. do. do. do. by the method of Mr. White.
69. do. do. do. do. by the knee in the axilla.
70, 71. Dislocation of elbow—both bones of forearm backwards.
72, 73. Dislocation of ulna alone backwards.
74. Dislocation of the radius alone forwards.
75. Dislocation of the radius backwards.
76. Dislocation of the first phalanx of the forefinger; with a piece of tape fastened with the clove hitch to effect extension.
77. Dislocation of the hip-joint upwards on the dorsum ilii.
78. Method of reducing the above.
79, 80. Dislocation of the hip-joint backwards.
81. Method of reducing the above.
82. Dislocation of hip-joint downwards.
83. Method of reducing the above.
84, 85. Dislocation of the hip-joint upwards and forwards.
86. Method of reducing the above.
87. Dislocation of the femur upwards on the space between the anterior spinous processes of the ilium.
88. Dislocation of the knee.
89. Dislocation of ankle inwards, with fracture of the lower end of fibula.
90. Simple dislocation of the tibia forwards.
91. Partial dislocation at the ankle-joint, the end of the tibia resting in part upon the astragalus, but a larger portion of its surface resting on the os naviculare, (see Cooper on Dislocations, p. 13, Phila. 1844.)
92. Simple dislocation of the astragalus.
93. Aneurismal varix.
94. Varicose aneurism.
95. Aneurism by anastomosis.
96. Method of extirpating erectile tumours by ligature.
97. Twisted suture, for cure of varicose veins.
98. Angular curvature of the spine from caries of the bodies of the vertebræ.
99, 100. Dislocation and fracture of the vertebræ.
101. Treatment of fistula lachrymalis by the stile.
102. Healing stage of ulcer of the cornea.
103. Nodules of lymph effused in symphylitic iritis.

FIG.

104. Extraction of cataract.
105. Operation for strabismus.
106. Nasal polypus.
107. Perforation of the antrum with a trocar for abscess of that cavity.
108. Hare-lip.
109. Fissure of the palate.
110. Forceps for extracting teeth of upper jaw.
111. Forceps for extracting teeth of lower jaw.
112. Key for extracting teeth.
113. Conical curved tube for trachea.
114. Bronchocele.
115. Dupuytren's forceps for strangulating the septum in artificial anus.
116. Common oblique inguinal hernia.
117. Direct inguinal hernia.
118. Congenital omental hernia.
119. Hernia infantilis, showing its two sacs.
120. Variety of hernia infantilis, in which the sac is apparently formed of tunica vaginalis, but its communication with the testicle closed.
121. Inguinal hernia.
122, 123. Surgical anatomy of femoral or crural hernia.
124. Obturator or thyroid hernia.
125. Section of a prolapsed rectum—the whole substance of the bowel everted and coming down.
126. Puncture of bladder by the rectum.
127. Stricture of the urethra.
128. Enlarged prostate, catheter in the urethra.
129, 130, 131. Weiss's screw lithotrite.
132. Lateral operation of lithotomy.
133. Diagram exhibiting an internal view of the parts of the neck of the bladder concerned in lithotomy.
134. Paraphymosis.
135. Talipes equinus.
136. Talipes varus.
137, 138. Parts concerned in venesection at the elbow, showing the veins at the bend of the elbow, and the relation of the brachial artery to the basilic vein, and the nerves.
139. Tourniquet.
140. Amputation of the thigh,—flap operation.
141. Amputation of the leg—flap operation.
142. Amputation of the arm, circular method.
143. Amputation of the forearm—flap method.
144. Amputation of the wrist.
145. Amputation of the finger at the last joint.
146. Amputation of the finger at the metacarpal joint.
147. Amputation of the head of a metacarpal bone.
148. Amputation through the tarsus,—Chopart's operation.
149. Ligature of common carotid.
150. Surgical anatomy of the arteries of the forearm and palm of the hand.
151. Surgical anatomy of the femoral artery.
152. Surgical anatomy of the posterior tibial artery.
153. Surgical anatomy of the anterior tibial artery.

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