Report on the epidemic fever of Edinburgh : an account of the symptoms and treatment / by William Henderson. Analysis and details of forty-seven inspections after death / by John Reid.

(12)

REPORT

ON THE

EPIDEMIC FEVER OF EDINBURGH.

AN ACCOUNT OF THE SYMPTOMS AND TREATMENT.

By William Henderson, F. R., C. Ph.,

Lecturer on the Practice of Medicine.

ANALYSIS AND DETAILS OF FORTY-SEVEN INSPECTIONS AFTER DEATH.

By John Reid, F. R., C. Ph.,

Lecturer on Physiology.

(From the Edin. Med. and Surg. Journal, No. 141.*)*

REPORT, &c.

THE fever described in the following pages has been epidemic in Edinburgh for three winters,—gradually declining as the spring advanced, and almost disappearing in the summer, that of 1836 excepted, in the course of which a considerable number of cases occurred, and it was then that the disease began to prevail extensively. This account of the disease has been constructed from cases which occurred during its last irruption, dating from the end of October 1838 to the middle of June 1839. Within that period nearly 200 cases came under my particular care,—and it is from these, although they form but a small proportion of the whole number admitted into the Royal Infirmary, that the account is derived.

The difficulty of forming a satisfactory diagnosis has been felt in many instances, in which the disease has terminated within six or eight days,—without scope having been afforded for the development of that group of symptoms, which in the second week, more especially, of continued fever distinguishes it widely from every other disease. The very continuance of a febrile state for many days, without apparent dependence on any particular local disorder, is, when other circumstances are wanting or insufficient, a material assistance in guiding to a correct opinion of the nature of the malady, and when this, as well as the peculiar symptoms of continued fever, is absent, as it is in the slighter cases, the diagnosis is very much embarrassed. The symptoms which attend the invasion of the fever, and the subsequent condition of the pulse, the skin, and the tongue, were found to be not uniformly of the same character in cases which were, notwithstanding, eventually on other grounds, ascertained to be cases of continued fever. Yet the symptoms of invasion, the state of the pulse, the skin, and the tongue, were the principal data afforded in the slighter cases, and in the earlier stage of the disease.

To exclude those slighter cases, to deny their intrinsical affinity to the other and severer cases, and to constitute them a different species of fever, are measures which do not appear to be justifiable, nor are they consistent with the custom of some very high authorities. Dr Bateman, in reference to this subject, says, in his account of the fever epidemic in London,—" Its character is greatly varied

by the different circumstances in which it occurs, by the age, constitution, and previous health of the patient, by the intensity of the exciting causes, by the situation and season, and by early neglect or mismanagement; but it is not more varied than other febrile diseases, the small-pox, for instance, or scarlet fever, under similar circumstances; and examples of the most distinct modifications which it undergoes are often observed in individuals of the same family. Thus in the instance of a man and his wife, who were brought to the House of Recovery together, the former was affected with the mildest symptoms of fever, which scarcely confined him to bed, and terminated in a speedy convalescence; while his wife was lying in a state of stupor, her skin covered with petechiæ and vibices; in a word, exhibiting the most formidable symptoms of the worst form of typhus. Yet these extreme degrees of the disease manifestly originated from the same cause; and it would be equally unphilosophical to account them different kinds of fever, and give them distinct generic appellations, as in the case of benign and confluent small-pox, which are generated in like manner from one contagion." If the presence of maculæ, red spots, or typhoid eruption, be considered as conclusive of the nature of the disease, though not necessarily a symptom in all cases of continued fever, then I can have no hesitation in deciding that this fever may run its course in a few days; for instances of convalescence have occurred to me on the seventh and eighth days, in which the eruption had existed, without which the diagnosis would have been perplexed as in other slight cases. The eruption, however, is not a usual character of slight cases; but, as may be observed in the account to be given of it, corresponds very generally with the severity of the case, and commonly becomes scanty and imperfect in the less severe cases, while in those of a slight nature it rarely appears at all, though these may have come from the same locality, and even from the same family as the others.

In the frequent absence of pathognomic symptoms in the early stage of fever, and, consequently, in such cases as do not extend beyond this stage, supposing it to comprehend the first seven or eight days, it has been thought proper, in order to determine the nature of those cases, and to exclude trivial disorders, bearing no affinity to continued fever, from being classed along with it,—to require in all the milder cases a correspondence with the majority of the more protracted and severe, in the following respects,—in the symptoms of invasion, and in the state of the pulse, tongue, and skin, (the eruption excepted), as exhibited in the early stage of the latter class of cases. The symptoms which characterized the period of the invasion of the fever were very generally headach, more especially frontal headach, pain in the lumbar region, in the lower limbs, and not unfrequently in either the chest or ab-

domen; these symptoms were in many preceded for a day or two by languor, dejection, anorexia, and transient chilliness, and accompanied by sensations of cold, in the back particularly, by impaired muscular strength, and mental activity, and, as ascertained in a few cases, by a soft, rather small, and accelerated pulse. For several days after this, even in the milder cases, pains in the head and back, and general soreness continued, while the skin became preternaturally hot and dry, the face flushed, thirst great, the tongue coated, and the pulse more accelerated, ranging in this early stage both in mild and severe cases, indifferently, from 90 to 120 in a minute, seldom much developed in size, commonly moderate in strength, or both small and tense. After the lapse of six or eight days, those symptoms became in the mild cases much modified, the tongue first beginning to clean, sleep becoming calmer and more prolonged, the skin moist and cooler, the evacuations, if previously dark, of a better colour, with other ordinary symptoms of convalescence. In those cases which did not begin to improve so early, the symptoms which have been detailed began sooner or later to be accompanied or succeeded by those indicative of greater muscular prostration, a more disordered state of the secretions, indications of cerebral disturbance or oppression, and impaired vigour of the circulation; while it was very generally among them, in this more advanced stage, that the skin attained its highest temperature. Convalescence in those cases was gradual, as in the others; sudden improvement, and speedy recovery, in connection with abundant secretion from the skin, bowels, or kidneys being extremely rare. In one or two cases spontaneous purging, or copious perspiration, were harbingers of convalescence. More commonly the change was gradual, denoted more by improvement in the nature of the intestinal evacuations than in their quantity, and by decrease of heat, and gentle moisture, than by abundant perspiration.

In giving a more particular account of the epidemic, I have had recourse, as far as the records enable me, to a numerical analysis of the most important symptoms; a method which, though it gives no definite delineation of any particular case, is yet best calculated to impart a general comprehension of a prevalent disease. The same plan is adopted in stating the results of treatment.

1. *Circulation.*—Regarding the state of the circulation, I need not enter into particular details, because its most important feature, strength, will be better understood from what is stated concerning the results of the different plans of treatment, than by the vague terms in common use to denote the sensation imparted by the pulse, concerning which also there is not unfrequently consi-

derable difference of opinion. In frequency the pulse, except in children, rarely rose so high as 140, but in the worst cases; in one adult female, it beat 156 times a minute on the thirteenth day, although no other unfavourable symptom was present, and the case ultimately did well. The common range in the height of the disease was from 110 to 130, the higher amount of frequency being usually the result of a gradual, but not regular, increase from day to day, from the commencement. In a very few cases it rose little above the natural standard.

2. *State of the Head.*—The head was almost universally the seat or source of symptoms in the course of the fever. These consisted of every diversity in degree, from the slightest uneasiness to severe pain, and from mere oppression, languor, and confusion of the faculties, to stupor and violent delirium, with vociferation, and attempts to get out of bed.

Headach.—Among 132 females, the state of the head in regard to pain was carefully noted in 108 cases. Of these, 104 were affected with headach in the course of the disease. Ninety-two of them were known to have had headach at the commencement of the illness; in twelve, the earlier symptoms were not fully ascertained, but the existence of headach was recorded at an after period; in four cases, there was no headach at any time. Of fifty-one cases among the male patients, in which particular notice was taken of the state of the head, forty-nine had headach.

Delirium, &c. in female patients.—In twenty-five females there was a notable degree of delirium; in thirteen much stupidity and indifference to external circumstances approaching to stupor; in fifteen there was deafness; in two considerably impaired vision at the commencement, with intense headach. The remaining cases had either no degree of those symptoms, or, as was commonly the case, were affected with inconsiderable confusion or sluggishness of mind, or muttering and moaning in sleep. Carphology, *subsultus tendinum*, and convulsions were rare; the two former mostly in the cases which ultimately were fatal, the last only once, and in a fatal case. Of involuntary evacuations no precise records have been kept; but, except towards the close of the fatal cases, there were few who could not give notice to the attendants, or express uneasiness when about to evacuate the bladder or bowels. Retention of urine occurred in three, who had no other very unfavourable symptom.

Date, persistence, &c. of these symptoms.—In a few cases headach in some degree continued throughout the course of the disease. It very generally persisted throughout the first week, means having been resorted to for its removal in few before the lapse of that period. The average duration of this symptom, de-

rived from twenty-nine cases, in which the date of its final cessation is specified, was ten days.

The other symptoms pertaining to the head belonged generally to a later date. Delirium began on an average of twenty-one cases about the eleventh day; in only three cases before the ninth; in the majority between the eleventh and fourteenth. Considerable oppression, approaching to stupor, was later still usually in presenting itself, the average being the fourteenth day.

The disorder of the mental faculties not only occurred at a date posterior to the average term of the headach, but held no particular relation to the pain. Thus, on selecting cases with the severest degree of headach, it appears that in twenty-nine such cases there were twenty-one that had at no period of the fever any cerebral disorder worthy of being noted, while eight had delirium. On the other hand, there were eleven cases of considerable delirium, in which the headach had been of the ordinary kind. In seven cases of delirium the headach had previously ceased; in four it was still present in a slight degree; in several of the others severe headach and delirium co-existed. The violence of the delirium did not seem to bear any correspondence to the pain, for of six cases of much delirium, with shouting and attempts to get out of bed, and in which the state of the headach could be learnt, in five the pain was slight or gone, in one only severe; while in two cases severe headach co-existed with moderate delirium.

Deafness came on about the thirteenth day commonly; in three, however, it was among the earliest symptoms, and accompanied at the commencement with severe headach. In five others at a later period there was some degree of headach along with the deafness. In six cases the deafness was associated with delirium; in one with a tendency to stupor.

Delirium, &c. in male patients.—Among sixty-six males there were twenty-three cases of delirium, and three of oppression approaching to stupor. Deafness existed in a smaller proportion than among the females; it has been noted in only one case. There was no difference worthy of remark between the males and the females in regard to these symptoms, with the exception of certain circumstances connected with the delirium. The proportion of cases which possessed this symptom was larger among the male patients, amounting to more than one-third of their number, while among the females it was less than one-fifth. The average date at which delirium began among the former was earlier than among the females, or on the tenth day; in nine cases on or before the ninth day. In two cases it had the character of extreme excitement, or furiosity, of which no case occurred among patients of the other sex.

Tremors of the tongue and hands were not uncommon; sub-

sultus in any considerable degree was confined to the fatal cases. Convulsions occurred in one person, a boy of fourteen years old. After headach, with tendency to stupor, for several days, he was seized with convulsive contraction of the upper extremities, convulsive motions of the lower, insensibility and strabismus,—the fit lasting about an hour, and recovery succeeding without relapse.

3. *State of the Digestive Canal.—Of the Tongue.*—In 100 cases among the females an exact account was kept of the state of the tongue. It very early became covered with an increased and altered secretion, white, yellow, or ash-coloured, 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. In seventy-three cases the tongue was dry at one period of the disease; in twenty-seven it continued moist throughout; and in several of these was at the same time almost quite clean, in cases too which were not always mild, for one with the tongue in this clean and moist state died on the thirteenth day.

State of the Evacuations, &c.—The observations on the state of the tongue and the following on that of the evacuations are applicable, generally, to patients of both sexes. The intestinal evacuations in their most disordered state were very dark, slimy, and offensive; and in a more or less considerable degree they possessed those 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 colour. In many at the time of admission into the hospital, the evacuations were consistent, though otherwise disordered: subsequently, either by the use of purgatives from day to day, or, as happened more especially in the advanced stages of the disease in a good many cases, by a spontaneous laxness of the bowels, the evacuations were thin, as well as offensive and dark-coloured. The laxness which occasionally occurred, and which I have not included in the account of diarrhœa, rarely amounted to more than four stools in twenty-four hours, and this state was not often sustained for several successive days, but was only occasional, and every such case had been, at a previous period, freely purged by medicine, and was very commonly subjected to the renewed operation of cathartics, notwithstanding the easy state of the bowels, as long as the discharges were of an unhealthy quality. A change from the unhealthy condition of the evacuations to a yellowish and lighter co-

lour, and less fœtor, very commonly accompanied, or immediately preceded, the indications of convalescence, or rather constituted one of the earliest symptoms of convalescence. In no instance was there a discharge of consistent feces towards the conclusion of the fever; in one case only was there discharge of blood from the bowels.

Among the female patients at the time of their admission, there were thirty-one cases in which the bowels were costive; and seventy three in which they were in an easy state. It was ascertained that twenty-eight of the latter had taken purgative medicine a short time previous to their admission. In all of these evacuations were easily and regularly maintained subsequently by moderate doses of medicine,—some having need of medicine for this purpose less frequently than others, owing to the condition of the bowels already noticed. In five cases there was spontaneous diarrhœa, or evacuation of very liquid stools, six or eight times, or oftener, in twenty-four hours. In two of these cases, the diarrhœa occurred at the beginning of the fever, and was not subsequently remarkable; in one it occurred on the sixth day, but afterwards the bowels required medicine to move them, and the abdomen was neither tense nor painful; one had copious purging on the nights of the eighteenth and nineteenth days of the fever, succeeded by convalescence; in the remaining case there was diarrhœa at the commencement, which was not remarkable again till the close of the disease, and was then accompanied by epigastric tenderness.

In forty-five men the state of the bowels was noted at the time of their admission. In nineteen the bowels were bound, in fifteen they were open from medicine, and in eleven moderately without medicine. Three cases had subsequently diarrhœa,—all very late in the disease. One case was that of a child, in whom towards the close of the fever, a degree of acute gastro-enteritis, with tension and tenderness of the belly, supervened; the other two cases had during the convalescence from fever with the ordinary symptoms, some bloody mucus in the evacuations, accompanied by pain in the abdomen, and some recurrence of pyrexia.

In twelve cases,—all women,—there occurred nausea and vomiting, chiefly at the beginning of the fever. Five of these had also pain and tenderness of the epigastrium.

4. *Pain and tumidity of the Abdomen.*—Forty-six cases among those of both sexes had abdominal pain and tenderness. In twenty-one the pain existed in the epigastric region; in eleven it was not confined to any particular part of the abdomen, and was unattended by any other remarkable disorder of that region; in eight a degree of general tenderness of the abdomen co-existed with tumidity and tension, in only one of which was there diar-

rhœa. Two cases had pain confined to the left iliac region, three to the left hypochrondrium, one to the right side of the umbilicus. Tenderness of the right iliac region was remarked in none. In a good many cases besides those specified, very firm pressure on the abdomen seemed to produce uneasiness, but not in a degree worthy of being recorded.

5. *State of the Respiratory organs.*—The respiratory acts were in a good many cases much accelerated in the advanced periods of the fever, in some to thirty-six or forty times in a minute, without any sign existing of disease in the lungs or bronchiæ. Among the men, there were twenty-five cases with symptoms of a disordered state of the thoracic viscera. Five had cough in a moderate degree without expectoration, two had merely pain in the chest on full inspiration, or on coughing, and eighteen had symptoms of bronchitis. These consisted of cough, expectoration, in some a degree of pain, and the usual catarrhal rattles. In three of these cases, the bronchitis had been present for several weeks before the fever; in eight, the bronchitic affection came on within the first seven days, and for the most part with the first symptoms of the fever. In the remainder, it attracted notice later; in several, not till convalescence from the proper symptoms of fever had begun, and then had the effect of prolonging a state of pyrexia and debility. In only seven cases were the expectoration very considerable, and the bronchitic rattles general. The bronchitis was usually subdued between the eleventh and eighteenth days.

Forty-eight cases among the women had symptoms of disorder in the chest. In fifteen of these they consisted of cough with little or no expectoration, and of pain on full inspiration without the other symptoms. Thirty-three cases had smart, or severe and general bronchitis, often with pain in some part of the chest, or feelings of tightness and dyspnœa, with accelerated respiration. In all these there was expectoration, in many to a very considerable amount,—from ten to twelve ounces in some in the course of a-day. In eleven cases the bronchitis came on in the first week of the fever at different periods from the commencement; and in a few it had existed for weeks previously. In six cases it did not occur till between the thirteenth and nineteenth days. Four of the females died of the bronchitis; one of them had habitual bronchitis, and emphysema of the lungs. Pneumonia did not occur in a single case of either sex. One female in an advanced stage of fever with bronchitis presented on the right side posteriorly an impaired sound of percussion, and small mucous or subcrepitous rattles at the same place; but next day, the sound of percussion was natural, and the symptoms generally improved. It was probably inflammation of the smaller tubes, with congestion of the lung. Of the seventy-three cases of both sexes affected with

symptoms of thoracic disease, many were affected with some of those symptoms which were referable to the abdominal viscera.

6. *State of the Skin.*—Typhoid eruption. One-hundred and thirty cases of both sexes were specially inspected with reference to this eruption. In one hundred and eight cases the eruption was found; in twenty-two it was not found, six of the twenty-two cases were not admitted till between twelve days and three weeks from the beginning of the fever; therefore, as will appear from what follows, it cannot be concluded that they had not had the eruption at an early period. Of the sixteen cases in which no eruption existed at any time, the greater number were slight cases; one only could be termed a rather severe case, extending to the fifteenth day. This case was not traced to contagion. Several of the other cases, both adults and children, in the place of the typhoid eruption, had petechial stains, which, as is well known, are distinguished from the eruption, by their not being affected by pressure, while the latter disappears for a short time when pressure is made.

Appearance of the Eruption.—The eruption appeared in four different forms, and the depth of colour varied in different cases.

1. The most common figure assumed by the eruption was that of elliptical, and, more rarely, circular spots, not raised in general above the surrounding surface, and from two to four lines in greatest diameter. Spots of this kind were either few and widely scattered, or in various degrees of abundance; when the most numerous being so closely approximated, that three or four might be included within the circumference of a shilling. In the greater number of cases, however, though abundant, they were scattered more widely.

2. A second form of the eruption consisted of punctuations, as if produced by the point of a pen dipped in blood. These punctuations varied also in number. When the most numerous, they covered the surface more completely than the first form; so much indeed in some cases, that at a little distance, the integuments appeared of an almost uniformly florid hue at the parts where the specks were most crowded. Generally they were less abundant than this, and gave an irregularly freckled aspect to the skin.

3. In one case the eruption consisted almost solely of large and intensely florid patches, half an inch in extent, and irregularly shaped. These were a little raised above the surrounding surface. Patches so large were more commonly noticed in very small number, mingled with some other form of the eruption.

4. The fourth distinct form of eruption was the papular. There were but few cases in which papulæ alone existed. In general, they were scantily disseminated through an eruption of another

form. There was nothing different in their appearance from other papulæ. They were of moderate size, like those of the second day of variola, and it was in this form of the eruption alone that desquamation of the cuticle distinctly occurred. They were easily distinguished from elevated elliptical spots, by their decided acumination.

It was not very unusual to find several of these forms of the eruption mingled together, more especially the first and second. Of fifty-three cases in which the figure of the eruption is specially detailed, thirty-two pertained to the first form; nine of these were closely spotted; seven moderately; sixteen loosely; ten were punctuated, six profusely, four moderately; one presented large patches; five were papular; and five were mixed.

Colour.—The colour of the eruption was influenced a good deal by what was natural to the skin. In persons of dark skin, it was commonly dusky or brownish red. On very fair skins, it was sometimes, especially in the beginning, a very light rose colour, deepening usually as the disease advanced. In general it was such as might be represented by a mixture of vermilion and lake, having a preponderance of the former. In a few the tint was somewhat purple; and this colour could be assumed by an eruption that had formerly been scarlet. This was particularly noticed in cases that became suddenly worse, and was a very unfavourable symptom.

Situation.—The trunk of the body presented the eruption much more abundantly and distinctly, in general, than the extremities. The upper part of the chest, the region under the mammæ, and the sides of the abdomen, were the most favourable situations for observing it. In not a few, especially when the eruption was abundant elsewhere, the extremities, particularly the haunches and thighs, were profusely mottled as with a closely set rash. The face was not commonly affected, or the eruption was with difficulty distinguished from the flushing common in the disease.

Time of its Appearance.—The exact period of the fever at which the eruption first presented itself I have been able to ascertain in but very few cases; a circumstance to be ascribed chiefly to the lateness of the general dates of admission into the hospital. In twelve cases only has the first appearance of the eruption been witnessed. In two it happened on the third day, in one on the fourth, in two on the fifth, in three on the sixth, the remaining four severally on the seventh, ninth, eleventh, and thirteenth. The three last dates must be esteemed as rarely witnessing the first appearance of the eruption; for although many more patients were admitted after the first week of the fever was over, than before that event, the eruption could be detected making its first appearance in only three after the eighth day. The

other cases had the eruption in process of development at the time of admission; about eighty cases admitted between the third and ninth days of the fever had the eruption already in progress.

Development of the Eruption.—The eruption was commonly developed gradually in the course of several successive days, before reaching its greatest amount. At first the spots were both few and faint in colour, or, if numerous at the earliest periods, still feebly coloured. Their subsequent increase in number and distinctness was usually progressive from day to day, and they attained their complete development after the lapse of periods various in duration. Thus while some had the eruption perfected on the sixth, or even on the fifth day, others known to have had some eruption on the fourth or fifth, did not present it in a complete state before the eighth or the tenth; and in one case, with eruption noticed on the seventh, it was not completed before the fourteenth. This last would appear from the following data to be a rare exception to the general rule. The dates at which the eruption attained its completion have been noted in forty-two cases. In thirty-five of these this event happened on or before the tenth day; twenty-five between the eighth and tenth inclusive; in the remainder between the eleventh and sixteenth days. While the eruption generally occupied, as appears from those facts, four or five days (supposing it to have usually commenced between the fourth and sixth,) in reaching its greatest degree,—there were some instances in which the transition from a faint and scanty condition, to the fullest distinctness and abundance took place rapidly, even in a single day. In one case the report on the ninth day is, "skin since yesterday abundantly covered with a florid eruption of small spots of various sizes;" the increase subsequently was trivial. The eruption was not necessarily abundant, though occupying several days in being completed, any more than it was scanty, though it became perfect rapidly. Thus, to give an extreme case in illustration of the former statement, on the seventh day, one florid spot was noticed on the trunk, on the eighth, three, and on the ninth, six, besides the few that were dispersed on the limbs. In some cases a moderate eruption continued for several days without increasing, and then became more abundant, and in others an eruption that had begun to fade has again become distinct, and even more abundant than formerly. In one after having entirely ceased, it came back in a slight degree.

Persistence of the Eruption.—The continuance of the eruption in a state of completeness was subject to considerable diversity. The date of the first indications of its decline was noted in forty cases; in eleven before the tenth day; in twenty between the tenth and twelfth, inclusive; in one as late as the seventeenth. This, compared with the dates at which the eruption was common-

ly completed, will leave from two to four days as the ordinary duration of the eruption in its complete state. In some cases, however, the limits of the completed eruption much exceeded this. Five and six days have been observed as the term of this state in some instances. On the other hand, in a few, the whole course of the eruption was very rapid; three days in two cases witnessed its origin and decline. The treatment appeared to exert some influence in shortening the course of the eruption. I have observed early blood-letting succeeded on the fourth day by its decline.

That the spots throughout the whole duration of an eruption were the same, I ascertained in a few cases, by surrounding a number of them with ink. In one case, those spots remained six days, in another seven, undergoing the same changes, merely, as the general eruption was doing.

Fading of the Eruption.—In fading, the eruption occupied an uncertain period. Of twenty-five cases, in which the date is recorded, at which the eruption had entirely disappeared, in nineteen this occurred between the thirteenth and eighteenth days; in one only earlier than the tenth. In the majority the spots continued to fade day by day, until after the lapse of four or five days, there remained but the faintest traces of stains in the skin. The whole was gone commonly about, or soon after, the close of the second week of the fever. From these facts it follows, that the whole duration of the eruption occupied commonly nine or ten days.

Progress of other Symptoms compared with the advance of Eruption.—In twenty-two cases of copious, or considerable eruption, there was an opportunity of observing the correspondence of other symptoms with the progress of the eruption. The result is, that in sixteen cases, the symptoms became aggravated to a greater or less degree in proportion as the eruption advanced, and became complete. The aggravation consisted of increased rapidity of the circulation, heat, and restlessness; and at the more advanced periods of delirium also in some of the cases. A great increase of the eruption in some of those cases preceded the aggravation of the other symptoms for a day, in others, they appeared to be nearly simultaneous. Four of the twenty-two cases died, and were among the sixteen. In one case only of the whole number did improvement in the symptoms correspond with the full development of the eruption. In five there occurred little or no change in the symptoms, on the eruption becoming copious.

Seriousness of Cases compared with the state of the Eruption.—The importance of the state of the eruption as an indication of the seriousness of the fever in individual cases may be learnt from the amount of the mortality among those with much, com-

pared with the mortality among those with scanty, eruption. Sixteen deaths happened among the cases in which the eruption was noted; and in ninety of the whole number, the amount of the eruption was recorded as being copious or considerable, or scanty. In sixty-five cases, the eruption was copious or considerable, and in twenty-five, scanty. Thirteen of the deaths occurred among the former number, and three among the latter. Two of the three had extensive visceral disease of long standing; the one, a mason, of dissipated habits, had the lungs much disorganized by tubercles; the other, a female, had chronic bronchitis and emphysema of the lungs. Of the thirteen, none were known to be such bad subjects for fever; seven of them had an eruption of the most copious kind; in six, it was considerable and general. Another method of ascertaining the relation which existed between the quantity of the eruption, and the severity of the fever, is the comparing the average duration of the disease in the two categories of cases. Thus, in fifty-five cases of abundant eruption, in which the dates of the commencement of the illness and of the convalescence, were ascertained with precision, it appears that the average duration of the intervening period was thirteen days and two-thirds. In the other class, many of the cases were so mild that reports were not taken so regularly as to enable me to ascertain exactly the time at which convalescence began in some of them. In eighteen cases, the dates are sufficient, and show the average duration to have been eleven days and a half. There was extremely little difference between the sexes in these respects. By the commencement of convalescence, I mean the earliest considerable improvement in the state of the pulse, of the evacuations, of the tongue, of the temperature, and of the intelligence.

The convalescence of cases with the eruption in abundance was not so speedily completed as in the other cases. The only data I possess on this subject are the periods which elapsed between the commencement of convalescence, and the time of dismission from the house. The latter, however, is not to be depended on as a criterion of completed recovery, since many circumstances on numerous occasions served to delay dismission totally unconnected with the state of convalescence. I shall not therefore enter at length into these details, but, as a specimen of the difference in question, the following may be given. On taking, without selection, about twenty cases from each class, the average residence in the hospital of those which had a scanty eruption, appears to have been nineteen days, while that of the others reached twenty-five.

Relation between the Symptoms and the Decline of the Eruption.—It appears in a former paragraph, that of forty cases in which the first appearance of decline in the eruption is mention-

ed, in thirty-one it occurred on or before the twelfth day; and, in order to determine how far the first decided indications of convalescence corresponded with the decline of the eruption, I propose to compare this with the averages ascertained in respect to the date of convalescence. The average date of commencing convalescence, taking all the cases, was the thirteenth day. The average date of commencing decline of the eruption in the forty cases was the eleventh. On inspecting the records of many of the cases, it appears, in accordance with these results, that convalescence was preceded for a day or two by a decline in the colour and abundance of the eruption. When cases were late of assuming the first appearance of convalescence, in them the eruption was prolonged much beyond the average term; thus, in one case not decidedly convalescent before the twenty-first day, the eruption is reported as being fainter only on the seventeenth, still accompanied by hot skin, deafness, and a pulse beating 120. In another, with convalescence commencing on the seventeenth day, the eruption is reported as continuing abundant on the fourteenth; and in a third, convalescent on the eighteenth, the eruption became fainter only on the fifteenth. Nor did these circumstances occur in cases which presented the eruption first at a later period than usual, for in a case convalescent on the sixteenth, which had an abundant eruption on the fifth, it was as distinct as formerly on the thirteenth day. A considerable number of examples might be added; and it appeared a general rule, that when the fever was protracted (independently of the mere supervention and irritation of local disease), the eruption likewise exceeded its ordinary duration.

Petechiæ and Sudamina.—Purple petechiæ, the result of ecchymosis, were frequently present in the second week of the disease. In some cases, they were very abundant, but in very few exceeded the number of typhoid *maculæ*, which commonly existed along with them. One *vibex* only was remarked in the whole number of cases. The petechiæ continued often distinct, though the eruption was declining. Sudamina were observed only in three instances, notwithstanding the frequent and careful inspection of the skin. The cases in which this eruption was noticed presented them on the tenth, eleventh, and thirteenth days.

7. *Ages.*—Among 119 females whose ages were ascertained, there were aged 60, 1 case; 50 and below 60, 3 cases; 40 and below 50, 10 cases; 35 and below 40, 7 cases; 25 and below 35, 33 cases; 20 and below 25, 13 cases; 10 and below 20, 41 cases; 5 and below 10, 10 cases; and one case at 4 years old. Among the men, the ages were ascertained in 42 cases; between 55 and 58, there were 3 cases; 40 and below 50, 5 cases; 35 and below 40, 1 case; 25 and below 35, 12 cases; 20, 1 case; 10 and below 20, 15 cases; below 10, 5 cases.

Age in connection with Mortality.—13 females died; and in 10, the ages were ascertained; of the other 3, 1 appeared above 40; the other 2 between 35 and 40. Assuming these accounts to be correct, the following is the state of the deaths in connection with the ages; 1 died aged 60; 2 between 40 and 45; 3 between 35 and 40; 3 respectively at the ages of 33, 30, and 29; 2 at 23; 1 at 18; 1 at 14. This statement gives a mortality above 35 of 1 in $3\frac{1}{2}$; between 25 and 35, a mortality of 1 in 11; and of 1 in 16, and $\frac{1}{4}$ below 25. These proportions are only approximations to the truth, because of the 132 female patients that were treated before this account of the fever was begun, with the addition of 16 that have been under treatment since, there are 29 of whom the ages were not ascertained.

Among 66 male patients, 7 deaths occurred in the course of the fever; and 2, after the proper symptoms of the fever had subsided, died in consequence of thoracic disease on the thirty-second and thirty-third days, without their ever having been so far convalescent as to have left their beds; while a third, who had recovered so far as to walk about the ward, and, indeed, was quite well on the twelfth day, died on the twenty-fourth of latent double pleurisy, and subarachnoid effusion. Omitting the last case, 9 deaths occurred among the men; one at the age of 58, 3 at 40, 1 at 30, 4 between 20 and 25, inclusive.

8. *Dates, circumstances, &c. of the Deaths.*—Altogether, adding the 16 cases alluded to above, 148 female patients had fever, 13 of whom died; wherefore, the deaths amount to 1 in nearly $11\frac{1}{2}$. Two admitted in a very bad state died in about forty-eight hours after. 4 cases died between the twelfth and eighteenth days with bronchitic symptoms predominant; 3 with predominance of cerebral disorder, much subsultus, stupor, and in one, convulsions; two of these on the ninth and tenth days; the date of the other was not ascertained. One case died of *cynanche membranacea*, extending into the larynx, on the 16th day. Five died between the eleventh and nineteenth, apparently of mere sinking and exhaustion, the most prominent symptom having been feebleness of the circulation, though the powers of the system generally were greatly enfeebled long prior to death. 9 of those fatal cases were admitted between the fourth and eighth days, inclusive.

In 5 of the fatal cases among the men, death was preceded for a considerable time by stupor, in two accompanied by hurried respiration. In two the respiration was chiefly disordered, one having had previously considerable bronchitis, the other without apparent bronchitis, extremely rapid respiratory acts, as many as 80 in a minute, for twenty-four hours before death, the pulse not becoming feeble till within a few hours of the close, and gangrenous spots occurring on the skin. The two cases that died so late as the thirty-second and thirty-

third days, had, the one gangrene of the lung around a tubercular mass, pleurisy, and bronchitis; the other much dilatation of the bronchial tubes, and pneumonia around them. The proportion of deaths among the men, including the two last cases, was 1 in $7\frac{1}{3}$.

9. *Propagation, &c. of the Fever.*—Whether any examples of fever actually occurred without there having been previous intercourse with the sick, we had no means of ascertaining; but at least a fourth of the cases denied exposure to contagion, and ascribed their illness to cold; while about as many could not refer it to either contagion or cold. Of 13 persons who were in attendance in various capacities on the cases described here, six had the fever previously, and four became affected with it for the first time, while officiating about the sick. About one-half of the patients traced their illness to intercourse with others affected with the disease. Cold weather had commonly the effect of increasing the number of admissions, which declined again when the temperature was moderate. These fluctuations were noticed not merely on a general and large scale as on comparing the effects of summer and of winter, but even in the latter season occasional changes of weather, though not persisting above eight or ten days, had the effect I have mentioned.

10. *Treatment.*—The only details into which I shall enter on this subject are those which illustrate the effects of two opposite plans of treatment adopted at different periods of the epidemic. As constituting a general practice at every period, the moderate and steady use of purgatives, the occasional application of leeches and blisters, and the administration of gentle diaphoretic remedies, may be specified. The following details refer to the effects of wine and of blood-letting.

In the course of the first two months of last winter, fifty-two female cases of fever were under treatment. During this period part of the practice pursued consisted of local remedies when pain existed, and of wine, as the disease advanced, when the pulse did not possess any considerable degree of firmness and size, even though not actually weak. The object in view having been, if possible, to prevent a further decline of the circulation, until the fever had attained its natural term of duration. Twenty-nine of the cases had wine in accordance with this view. Twenty-two of these received wine first between the seventh and twelfth days inclusive, one only earlier. The average quantity given at first was four ounces and a-half daily. This was subsequently increased in twelves cases to quantities varying from eight to twelve ounces, eight of these also appeared to require from three to six ounces of spirits daily. The average duration of the cases thus treated was, till the commencement of convalescence, fifteen days

and a-half. That of the apparently milder cases which had no wine was less than eleven days. Six deaths occurred in the fifty-two cases, or, deducting a hopeless case, aged sixty, five deaths happened among those who were in no particularly unfavourable circumstances when admitted into the wards,—giving a proportion of one in ten. All the five were admitted before the eighth day of the fever, and, with the exception of one aged thirty-six, were between eighteen and thirty-three years old, and not more deficient in apparent robustness than the generality of females about the same time of life. So many deaths of persons seemingly favourable subjects for fever induced me, subsequently to the end of December, to adopt a contrary course of treatment. Between the end of December and the end of July last, ninety six females were admitted. Of this number, thirty-six were bled from the arm. The average quantity from each patient was twenty ounces; one of them, from whom but a small quantity could be had from the arm, had subsequently sixty-three leeches applied to various parts. Eight cases were bled to thirty ounces and more, for the most part at two different periods on successive days. One of these lost forty-one ounces; one forty-two; one thirty-eight; two thirty-six; one thirty-three; eight between twenty and thirty.

The circumstances looked for in almost every case as indicative of the propriety of blood-letting 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 important particulars of this list were not attended to, and two of them were fatal. The one, though apparently robust, had recently recovered from an illness, and was reported to have been habitually in delicate health, the other was a drunkard, and had been nursing for some months. These were the only deaths among the cases that were bled, giving a proportion of 1 in 18. Five of the 36 cases required wine at a late period of the disease, but only in one were stimulants administered freely; and, with the exception of two, they were bled to less than the average quantity, viz. fourteen ounces and under. Two of the cases that had wine were those that died, —the one on the ninth day with stupor and convulsions, the pulse not remarkably feeble; the other on the thirteenth, with hurried breathing and small soft pulse on and after the tenth. Of the 96 cases, twenty-four which were not bled, had wine from the ninth to the fifteenth day of the disease, two excepted, which had wine on the seventh. The average quantity begun with was three ounces, and in 6 cases only did it exceed five daily; three of these had above eight ounces.

Duration of the Cases.—The average duration of the cases

that were bled and recovered, as ascertained in 28 cases, was eleven days and two-thirds, up to the commencement of convalescence. The average of the 24 that had wine was fifteen days.

Deaths.—Of the ninety-six cases, seven died; or, subtracting cases that were admitted after all prospect of benefit from treatment was over, five died, giving a proportion of deaths, resulting from a cautious and sparing use of stimulants, and occasional blood-letting, of 1 in 19, or, including the 2, 1 in 14 nearly.

Dates of the Blood-letting.—Thirty were bled on or before the eighth day of the disease, two as late as the eleventh, one on the twelfth. The two fatal cases were bled, the one on the seventh day to twenty ounces,—died on the thirteenth,—the other on the sixth to fourteen ounces,—died on the ninth.

Ages.—One was aged 49; 35 and below 40 there were 2 cases; 30 and below 35, 4 cases; 20 and below 30, 14 cases; 14 and below 20, 12 cases. The cases that died were aged 23 and 29.

Appearance of the Blood and state of Symptoms.—In 10 cases the blood was natural in colour and the crassamentum firm; in two of these the venesection was practised after the eighth day, viz. on the eleventh and twelfth. Four of them had some cough with much pain of the chest, aggravated by full inspiration before the blood-letting; two had abdominal tenderness; four had chiefly severe headach, general distressing soreness, and restlessness. In 5 the pulse was above 120, small and firm; in the others between that and 90, and of good strength. In all of these cases speedy relief to pain was the consequence of the loss of blood; in two, however, not till the evacuation was repeated once and twice respectively. In one case the favourable change was temporary, and death happened six days after.

In 6 cases the blood was distinctly sizy; in 2 cupped also. Five of them were bled between the fourth and the eighth days; 1 on the tenth. Before the evacuation, 5 had severe headach, and either much general soreness or tenderness of abdomen, or pain of the chest, with cough; 1 had much soreness, oppression, and pain of throat, without headach. The pulse ranged from 100 to 126, mostly small and tense; in 1, 126, and full; in another, 100, and moderate. The effects were in all, after a first or second bleeding, much relief or total removal of the pains, and feelings of oppression; and in 5 the pulse had fallen in frequency on the following day from 16 to 26 beats.

In 4 cases the crassamentum, in other respects natural, presented a greenish or olive tint on the surface. These were bled between the fourth and eighth days, with permanent relief to the previous pains in the head and chest. In 6 cases the crassamentum, though natural in colour, had less firmness than that of

healthy blood. Two of these were bled on the sixth day ; 1 on the seventh ; 2 on the ninth ; 1 on the eleventh. Those bled on the two last dates had the crassamentum of the least consistence. With the exception of 2, who were bled with much relief to twenty and twenty-seven ounces, those last cases did not bear venesection well. One died on the ninth day, and in the others, the disease extended much beyond the average of the cases that were bled, for it lasted on an average sixteen days, and one extended to the twenty-first.

Among the men only 13 cases were bled ; the average quantity was twenty-five ounces; the largest was forty-six ounces, in the course of four days, which was borne well, and succeeded by recovery. Ten of them were bled on the fourth, fifth, sixth, and seventh days ; 2 on the ninth ; and 1 on the twelfth, for the first time. Twenty-four ounces were the most taken at one time, and in patients of both sexes, the quantity at each venesection was regulated by the effects, either relief of the symptoms, or feebleness of the pulse. With the exception of one, aged 46, and of another, aged 14, the ages, as far as could be ascertained, were between 18 and 30. Two died, one aged 25, the other 30. The former, a robust man, was bled only to twelve ounces on the seventh day ; and on the tenth, the pulse was moderate in strength, and beat 108. Sudden cerebral symptoms came on on the eleventh, and after being furiously delirious for two days, he died comatose. The latter, bled between the sixth and ninth days to forty-two ounces, died on the fourteenth, having had very rapid respirations and delirium, but not a feeble pulse, (beating at 124 and 126,) for two days before his death. He had several gangrenous patches on the integuments of the chest, commencing on the twelfth day. The cases are too few, and the details too imperfect, to render a further analysis of them interesting.

The only other facts connected with the treatment, which are worthy of being mentioned, relate to the means which were used to subdue the bronchitis. When not attended with much expectoration, and when no other circumstances contraindicated the practice, blood-letting, leeches, tartar emetic, and blisters, were the ordinary remedies. In a considerable number of cases, however, the abundance of the secretion appeared to threaten danger, while these remedies were inadmissible, the blisters excepted. Under these circumstances, very great service was derived from the acetate of lead. It was given in doses varying from half a grain to two grains, several times a day, and usually in union with small quantities of the compound powder of ipecacuan, and one or two grains of squill. The effect in restraining the secretion was often apparent in a few hours. In several very severe cases of bronchitis with profuse secretion and rapid breathing, doses of tincture of

cantharides, given alternately with the acetate of lead, appeared to hasten the reduction of the secretion. Some of these required a pretty liberal use of wine at the same time.

W. H.

Appearances observed after death.

As superintendant of the pathological department in the Royal Infirmary of Edinburgh, I have had occasion to conduct the *post mortem* examination of a considerable number of fever patients, and I shall endeavour in the following part of this paper to give an analysis of the morbid appearances which were observed. I find on consulting the Statistical Register of the Infirmary, that 2037 fever patients have been treated in that institution within the last fifteen months, and of these, 276, or 1 in $7\frac{105}{176}$ died. Of these 2037 patients, 962 were males, and 1075 were females. Of the males, 160 or 1 in $6\frac{2}{160}$ died; and of the females 116 or 1 in $9\frac{31}{116}$ died. From certain imperfections in the mode of keeping the Statistical Register, but which are now remedied, the above numbers are not to be considered as quite accurate, but they at least furnish an approximation to the truth. The number of fatal cases which I have personally examined within the period referred to, amount in all to 47. Among these are not included six cases where the patients were seized with some other disease which proved fatal, during convalescence from fever. I may state, that more than 47 fatal cases of fever have been inspected in the Infirmary during the last fifteen months, as I have not included the cases which were inspected during three months when the disease was raging with great severity, as I was absent from indisposition.

Of these 47 fatal cases of fever, 31 were males, and 16 only were females, so that the males form nearly two-thirds of the whole number. The average age of these 47 patients was $35\frac{8}{47}$ years. Of these, six were between 14 and 20 years of age, twelve between 20 and 30, eleven between 30 and 40, nine between 40 and 50, seven between 50 and 60, and two between 60 and 70. The average duration of the disease before death, as calculated from 43 cases in which this was supposed to be ascertained with tolerable accuracy, was $12\frac{1}{2}$ days. The earliest death occurred on the 6th, the latest on the 22d day of the disease.

The brain was examined in 43 cases out of the 47. Of these 43 cases increased effusion of serum within the cranium was observed in 25, or in more than a half. The most common seat of this effusion was under the arachnoid. In five out of the 25 the quantity of serum effused was sufficient to elevate the arachnoid above the surface of the convolutions only at the most depending parts. In other five out of the 25, the effusion of the serum

under the arachnoid was slight, but in one of these there was increased effusion into the cavity of the arachnoid; in a second, the lateral ventricles contained nearly three drachms of serum; in a third there was increased effusion into the cavity of the arachnoid, and a considerable quantity flowed from the sulci on slicing the brain; in a fourth, the lateral ventricles were evidently, though slightly, distended with serum; and in the fifth, seven drachms of serum were removed from the lateral ventricles. In 14 cases out of the 25, the quantity of serum effused was sufficient to elevate the arachnoid above the convolutions, not only at the posterior or depending parts of the surface of the brain, but also over the middle parts. In one case out of the 25 the arachnoid was not only elevated above the surface of the convolutions, at the posterior and middle parts of the brain, but also over the anterior or most elevated parts, and the lateral ventricles were also slightly distended. Out of the 14 cases in which the quantity of serum effused was sufficient to elevate the arachnoid at the posterior and middle parts of the surface of the brain, the lateral ventricles contained an increased effusion of serum in five; in one case this amounted only to between two and three drachms; in another case to between three and four drachms; in two cases to one ounce; and in one case to ten drachms. In one of these 14 cases, there was a dark-red spot in the left *corpus striatum*, of the size of a sixpence, apparently produced by great congestion of the blood-vessels, and there was also slight disease of the large arteries of the brain. In those cases where the quantity of serum effused was sufficient to elevate the arachnoid above the surface of the convolutions at other parts besides those most depending, it also flowed out and in many of these in considerable quantity, from the sulci in slicing the brain. The vessels of the brain in all the cases except in one, in which this organ was examined, were well filled with blood, and in many, a greater number than usual of red points presented themselves on the cut surfaces of the brain. In all except in one, the substance of the brain was of natural consistence; and in this case the softening was slight, extended throughout the whole brain, and occurred during hot weather.

With regard to the symptoms which were observed during life in the 25 cases in which an increased effusion of serum was found within the cranium, and recorded in the journals kept by the physicians and their assistants, I find that those which may be supposed referable to the head are the following. In the five cases in which the serum effused was sufficient to stretch the arachnoid above the surface of the convolutions only at the most depending parts, one is stated to have been confused; another was restless, and, according to the report of the nurse, had a convulsive fit the night preceding his death; a third had stupor with tracheal

râles two days preceding his death, soon became comatose, and continued so up to the time of death; a fourth had headach on admission with muscular tremor. In the case in which there was no increased effusion under the arachnoid, but where there was increased effusion into the cavity of the arachnoid, the patient is stated to have been restless and delirious the third evening preceding his death, and on the morning of his death had *subsultus tendinum* and muscular twitches. In the case in which the lateral ventricles were slightly though evidently distended, without any increased effusion under the arachnoid, the patient is reported to have been violently delirious, requiring coercion during the night previous to his death. He remained delirious next day, and died in the evening. In the case in which seven drachms of serum were effused into the lateral ventricles, without increased effusion under the arachnoid, the patient when admitted on the eighth day of the disease, and two days before death, complained of headach, and the pupils were contracted.

In the fourteen cases in which the quantity of serum effused under the arachnoid was sufficient to elevate that membrane above the surface of the convolutions at the posterior and middle parts, one had delirium at night, (this was the case in which between three and four drachms of fluid were effused into the lateral ventricles); a second had much muttering delirium during the last two days he lived; a third talked incoherently, and had the face flushed the day before death; a fourth had on the day before and on the day of his death, convulsive movements of head, neck, and shoulders, preceded by a girding headach; a fifth had no alarming symptom until the morning of death, (twelfth of the disease,) when he became completely insensible; a sixth had headach on admission, (seventh day of disease,) for which leeches were applied, and became delirious on the morning of death (seventeenth); in a seventh, the head was pretty clear until the fifteenth day of the disease, which was the second day before death, when she became talkative and incoherent. The pupils were contracted, and the respirations were noisy on the morning of death. In an eighth the patient, three days before death, complained much of headach, and two days before death the pupils were contracted, extremities cold; pulse 92, (formerly 108); countenance anxious, with moaning and delirium at night; in a ninth the patient was comatose, and the pupils were contracted the day before death; in a tenth, the patient was previously subject to fits of insanity, and she was insensible for several days previous to her death; in an eleventh, the patient, three days before death, had much *subsultus tendinum*, and a tendency to stupor, with contracted pupils, (in this case one ounce of serum was removed from the lateral ventricles); in a twelfth, (the case in which ten drachms of

serum were effused into the lateral ventricles,) it is stated that he became oppressed and low, and had vomiting two nights previous to death; on the day previous to his death he attempted to get out of bed, and had constant tremor of lower jaw, restlessness, and moaning; he put out his tongue when desired, but gave no other evidence of intelligence; he became comatose at 2 o'clock next morning, and died at 10 A. M. In the case in which the serous effusion extended over the anterior part of the brain, the patient had much muscular tremor for two days before death, and was comatose for several hours before death. In the other cases in which increased effusion of serum was found within the cranium, they appear to have had only the confusion of thought so commonly observed in fever; and it is of importance to remark, that, in one of those cases in which one ounce of serum was effused into the lateral ventricles, and the arachnoid elevated above the surface of the convolutions at the posterior and middle parts of the brain, the symptoms were typhoid, without any marked local symptom.

We have now to inquire if, in the eighteen cases where no increased effusion of serum was found within the cranium, any symptoms presented themselves similar to those we have described as occurring in the cases in which an increased quantity of serum was effused, as it is only in this way that we can ascertain what relation there is between the appearances observed after death, and the symptoms which manifested themselves during life. In one of these eighteen cases, it is stated that she had furious delirium on the second night previous to her death. In a second case, there was much headach and muttering delirium for a few days previous to death; (this was the case in which the brain was unusually pale.) In a third, there was on admission headach, suffusion of the eyes, and flushing of the face; he became comatose on the morning of his death; the face and extremities became livid, with feeble pulse, and he died ten hours after. In a fourth case, there was severe headach on admission, (fifth day of disease, and the fifth before death,) for which leeches were applied to the temples; on the seventh day of the disease, he was drowsy, and the pupils were contracted, and on the day of his death he became comatose. In a fifth case, the patient on admission was unable to give any account of himself; the pulse was quick, and of good strength; the eyes were suffused; the pupils were contracted, and he had slight subsultus; he remained insensible, and died on the third day after admission. In a sixth case, the pupils were contracted, and the patient gradually became more confused and feeble. In a seventh case, the patient was admitted in a drowsy state, the respirations were short and hurried, and she died next day. In an eighth case, the patient was delirious for six

days after admission, but became calm three days before death. In a ninth case, there was no very unfavourable symptom until the night of the fifth day of his disease, when he became delirious; the pulse gradually sunk, and he died on the seventh day. In a tenth case, no urgent symptom had presented itself up to the night of the eighth day of the disease; she had remained tolerably quiet after an opiate until 3 o'clock in the morning, when she began to mutter indistinctly, and died in about five minutes. In an eleventh case, the patient had reached the seventh day of the disease without a dangerous symptom, when he suddenly fell back while sitting up in bed, and shortly after expired. In a twelfth case, the patient the evening before death had a convulsive fit, with movements of arms and lower extremities, and distortion of features, which lasted for about ten minutes; she had two similar attacks within four hours; she became insensible after the first convulsive attack, and died next morning. In a thirteenth case, the patient when admitted, the day before death, had muscular tremors, the intellect was confused, and he answered questions imperfectly. In a fourteenth case, the patient was delirious, and attempted to escape out of a window two nights before death, and on the night preceding death he was very restless.

From this review of the *post mortem* appearances observed in the brain after death from fever, and the symptoms with which they were attended during life; and from the contrast we have instituted between those cases where an anormal quantity of serum was found within the cranium, and those cases where the usual quantity only was observed, we think we are justified in concluding, that they afford no distinct evidence that the serous effusion was in all cases, if in any, the cause of death. We have seen one case in which one ounce of serum was effused into the lateral ventricles, and yet nothing different from the usual confusion of thought was observed. We have also seen the cerebral derangement as strongly marked in those cases where no increased effusion of serum was found within the cranium after death, as in those where this was observed. Besides, it must be remembered, that it is not unusual to find increased serous effusion within the cranium in old people, or when the patient has been emaciated by previous disease, in quantities equal to what we have described as occurring so frequently in fever. And this last statement naturally leads us to inquire into the probable effects of age, and the duration of the disease, upon the amount of this serous effusion. I find that the average age of the cases in which an increased effusion of serum was found within the cranium, was $42\frac{2}{3}\frac{1}{5}$ years; while the average age of those in which no increased effusion was found within the cranium was $26\frac{1}{1}\frac{6}{8}$ years. The average age of the four patients in which seven drachms or upwards of serum were

found within the lateral ventricles was 57¼ years; the youngest being 48, and the oldest 68 years of age. With regard to the average duration of the disease in the two class of cases, we do not find so striking a difference. The average duration of the disease in the cases in which an increased effusion of serum was found within the cranium (as calculated from 24 cases) was $12\frac{2}{24}$ days; while the average duration of those cases in which no increased effusion of serum was observed within the cranium was $11\frac{1}{18}$ days, or only a difference of nearly one day.

It has already been stated that, in most of the cases in which the brain was examined, we observed the blood-vessels well loaded with blood, as indicated by the numerous red points which presented themselves on the cut surfaces of the brain. In judging of the degree of vascular congestion in the brain, we ought to remember that part of the increased quantity of blood in the vessels of the brain may be merely apparent, and arise from the fluid state of the blood; for it is obvious that, if the blood remain fluid, the pressure of the knife used in slicing the brain will force the fluid blood through the open mouths of the vessels upon the cut surfaces.

In judging of the probable causes of the congested state of the blood-vessels of the brain, and of derangements of its functions, we must take into account the state of the respiratory organs; for it is apparent, that if there be any impediment to the passage of the blood through the lungs, this may influence materially the circulation within the cranium, even in those cases where the respiratory function is only secondarily affected through derangement of the central organs of the nervous system; for it is equally obvious that when from this cause there is any impediment to the circulation through the lungs, it will react upon the central organs of the nervous system, and increase the primary derangement. And this leads us to examine the condition of the *lungs* in those cases in which the brain was examined. In the 43 cases in which the brain was examined, the lungs were examined in 39. In the 25 cases in which an anormal quantity of serum was effused within the cranium, the lungs were examined in 23; and in the 18 cases in which no anormal quantity of serum was effused, the lungs were examined in 16. In the 23 cases in which more than the usual quantity of serum was effused within the cranium, the lungs, in 1 case, were scarcely engorged with blood, even at the depending parts; in 3 cases they were found simply engorged with blood at the depending parts; in 1 case the engorgement was combined with the effusion of frothy serum; in 2 cases, with frothy serum and the presence of old tubercles in both lungs; in 1 case with old pneumonia of right lung; in 5 cases with the effusion of frothy serum, and the greater or less quantity of mucus into the bronchial tubes;

and in 10 cases the lungs were congested at the posterior and middle parts with blood and frothy serum, and in some parts were so dense as not to crepitate when cut, and in 3 out of the 10 cases part of the dense portions when cut out sank in water, though they did not present the usual granular appearance of the second stage of pneumonia. Of the 13 cases in which the lungs were examined, where there was no increased quantity of serum found within the cranium, in 8 these organs were simply engorged at the posterior parts to a greater or less extent; in 2 cases this was combined with the effusion of a considerable quantity of frothy serum; in 1 case there was recent pneumonia of the upper part of one lung; in 2 cases the engorged state of the depending portions of the lungs and the effusion of frothy serum, was combined with an increased quantity of mucus in the bronchial tubes; and in 3 cases the posterior and middle parts of both lungs were gorged with blood and frothy serum, and some parts were so dense as not to crepitate when cut. In comparing the frequency of the lesions of the lungs in the cases in which an increased effusion of serum was found within the cranium, with those cases in which this was awanting, they will be found to preponderate in the former, particularly in that kind of lesion last-mentioned, and which it is to be remarked would be attended by great impediment to the free aëration of the blood, and, consequently, to its free circulation through the lungs.

It is probable, however, that the increased effusion of serum within the cranium, and the greater plenitude of the blood-vessels of the brain, occur too frequently to be fully accounted for by the age of the patient, the previous emaciation of the body, and the derangement of the respiratory function, and that it may, in a few cases, be owing entirely, and in others much aided by causes connected with the nature of the disease itself, and by which that disturbance of the cerebral functions so generally observed in fever is induced. The facts which we have stated ought, however, to render us very cautious in attributing the phenomena observed in any individual case of fever, to increased plenitude of the blood-vessels, or to the effusion of serum.

The lungs were examined in 4 cases in which we were not permitted to inspect the brain. In 1 of these they were congested with blood at the depending parts, and a small portion of both lungs was œdematous; in a second case the larger bronchial tubes and a great number of the smaller, were full of puriform matter, and there was a small cluster of old tubercles in the apices of both lungs; and in the 2 remaining cases there was a considerable quantity of frothy and puriform mucus in the bronchial tubes of both lungs. In all, then, the lungs were examined in 43 cases. In 10 of these there was increased effusion of mucus into the bronchial

tubes; in 13 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; in 1 case a great part of one lung was dense from old pleuro-pneumony; in 1 case the upper and back part of the right lung was in a state of recent pneumonia, passing into the third stage; and in 3 cases there were old tubercles in the lungs. In 15 cases out of the 43, the lungs were perfectly normal, with the exception of a greater or less degree of simple congestion of the most dependent parts. I would have hesitated in classing the case where acute pneumonia running on to the third stage was found, among the cases of fever, and would have been inclined to believe that it was a case of latent pneumonia, attended with typhoid symptoms, or that the pneumonia had occurred during the convalescence from fever, had I not been assured by Dr Peebles, under whose charge the patient had been placed, that the usual febrile eruption on the skin was present, and that the pectoral symptoms came on before any decided signs of convalescence had presented themselves. When fever is prevalent, cases of latent pneumonia in an advanced stage, and attended by typhoid symptoms, are very readily mistaken for continued fever, unless the attention of the physician be particularly directed to the chest. I examined the bodies of three patients within a short time, who had been sent into the Infirmary as cases of continued fever, but, from the appearances observed on dissection, there could be little doubt that they were cases of latent pneumonia which had gone on to the third stage, with very little of the usual pectoral symptoms. In the 13 cases in which the posterior and middle parts of the lungs were loaded with blood and serum, and some portions were so dense as not to crepitate when cut, resembling, as we have elsewhere stated,* the appearances observed after section of the vagi nerves, these anormal appearances were in all probability principally dependent upon the disturbed respiration consequent upon derangement of the central organs of the nervous system, and generally occur a short time before death. This may also arise from the enfeebled action of the right side of the heart, for when the heart's action is feeble, the bronchiæ somewhat obstructed, and the blood more fluid than usual, the right side of the heart is unable to propel the blood through the lungs, it consequently goes on accumulating in the depending parts, and the same results follow as when the respiratory movements are deranged.

From the Journals I find that the following symptoms referable to the derangement of the respiratory organs were observed dur-

* No. cxxxix. of this Journal.

ing life. One had cough before she was attacked by the fever, which continued during the disease, but with no great severity, but the breathing became much oppressed. In a second case the patient had cough and expectoration of long standing. He had been a stone-mason, and had dark hard tubercles disseminated through his lungs. In a third case, the patient had oppression of breathing with mucous râle, and moaning for six days before death. In a fourth case, the patient when admitted on the eighth day of the disease, and the seventh day before death, had cough and expectoration. In a fifth case, the patient, on the seventh day of the disease, and the seventh previous to death, had cough and pain in the chest. In a sixth case, the patient two days before death had stupor, with tracheal râles. In a seventh case, (the case in which the recent pneumonia was observed,) the respirations were very hurried for more than twenty-four hours before death, but no cough was remarked. In an eighth case, the patient on the twelfth day of the disease, and the seventh before death, had some oppression of the breathing, with mucous râles, and the respiration continued oppressed up to her death. In a ninth case, there was cough and expectoration, attended by dyspnœa. In a tenth case, the patient on the second day of admission, and the twelfth day of the disease, was seized with cough, and catarrhal râles were heard in both sides of chest. On the seventh day of admission, and the seventeenth of the disease, the respirations were hurried, the face livid, with loud mucous râles in chest. On the tenth, she ceased to expectorate, and died on the twelfth day after admission, or the twenty-second day of the disease. This patient had been for some years liable to bronchitis on the slightest exposure to cold. It is perfectly obvious that these lesions of the lungs are not the cause of fever, and are not even essential to it; yet they frequently occur during its progress, complicate the disease, and render it more dangerous.

We next proceed to state the result of the examination of the Abdominal Organs. These were examined in 41 cases out of the 47. In these 41 cases the elliptical patches of Peyer were apparent and distinctly defined in 24, and in 4 of these the solitary glands at lower part of ileum were also distinctly visible. In 6 cases out of the 41, they were indistinctly defined and scarcely visible; and in 11 cases they could not be distinctly recognized with the naked eye. In all the cases in which the elliptical patches were distinctly visible, except in 2, they were of a bluish colour, or rather of a grayish colour, dotted over with dark spots. In 4 cases only were these patches distinctly elevated; in 2 of them this elevation was to no great extent, and limited to a few patches. In 2 only were these elliptical patches very distinctly elevated, and presented any appearance of ulceration. The appearance of

the elliptical patches, which we have described as most commonly observed,—viz. of a grayish colour with small dark dots on the surface, and without any distinct elevation, and no appearance of increased redness or ulceration,—is not peculiar to fever, but is not unfrequently observed in various other diseases, though not with the same frequency in other diseases as in fever. Some of the cases in which the elliptical patches and solitary glands were not visible had been actively purged during the progress of the disease by doses of calomel and jalap. On calculating the average duration of the disease in the cases in which the elliptical patches were visible, and comparing the result with a similar calculation of the duration of the disease in those cases in which the elliptical patches were not visible, I find that there was not any great difference in the average duration of the disease in the two classes of cases. In the cases in which the elliptical patches were visible the average duration of the disease was $13\frac{25}{24}$ days; and the average duration of the disease in these cases in which they were not visible was $11\frac{9}{11}$ days, or a difference of nearly 2 days. The average age of the two classes of cases was nearly the same. Out of the 11 cases in which the elliptical patches were not visible 2 only were females. The mesenteric glands were distinctly enlarged in 2 cases only. In 1 of these they were at the same time softened, in the other they were nearly of their usual consistence. We have already stated that in 2 cases only out of 41 in which the intestinal canal was minutely examined, were the elliptical patches of Peyer very distinctly elevated and ulcerated. As the lesions of the intestinal canal, observed in fever, have excited considerable interest and discussion, we shall describe these two cases more in detail. One of these was a male, aged 25 years. On admission, he stated that he had left the county of Sligo (Ireland) eleven days before, and that he felt rather unwell at that time. When admitted his skin was hot and dry; pulse frequent; countenance depressed; bowels constipated. On the evening of the second day of his admission he was very delirious, and made an attempt to escape through a window, and cut his face considerably. Pulse 96; tongue dry; had a dose containing a drachm of sulphate of magnesia, one ounce of infusion of senna and one drachm of tincture of jalap, without any effect. Had much restlessness during the evening of the fourth day of his admission, and died next day. The bowels were not opened freely until shortly before death, when he had taken, besides the above-mentioned cathartics, two colocynth pills, half an ounce of tincture of senna, and had an assafœtida enema. He made no complaint of abdomen. The body was inspected twenty-four hours after death. No increased effusion of serum was found within the cranium. The elliptical patches of Peyer were very distinctly elevated over an extent of

twenty feet of the small intestines, and the solitary glands over an extent of five feet, both measurements commencing at the ileo-cæcal valve. These elliptical patches were of a gray colour, with a greater or less tinge of red at different parts, and at some places projected $\frac{3}{24}$ of an inch above the surrounding healthy mucous membrane. At the lower part of the ileum the elliptical patches were irregular on the surface, and presented several superficial and ill-defined depressions (ulcerations.) About two feet above this they appeared somewhat flocculent on the surface, and were studded with numerous small rounded depressions. At the upper part of the ileum their surface was covered with a number of dark gray dots, without any distinct depressions. On making a longitudinal section of these patches through the whole thickness of the intestinal tube, the texture of the peritoneal and muscular coats were unchanged, though the latter appeared somewhat thickened at the seat of some of the patches; and that part of the cellular coat which lay next the muscular also presented its normal appearance. A mass of a grayish colour, with red lines indicating blood-vessels ramifying through it, adhered to the inner surface of the cellular coat, and projected into the cavity of the intestinal canal. On attempting to trace the mucous membrane over the surface of these morbid masses this was found to be impossible, and no distinct line of demarcation could be observed between the mucous surface and the morbid masses. It required some slight force to break up these enlarged patches with the nail, and they were softer on their inner surface than in the interior. The solitary glands were nearly of the size of split-peas, also of a grayish colour, and not ulcerated on the surface. The mesenteric glands were considerably enlarged,—the largest measuring $1\frac{2}{12}$ inch in length, the same in breadth, and $\frac{6}{12}$ of an inch in thickness, the next largest $\frac{10}{12}$ of an inch in length, and $\frac{5}{12}$ in thickness. They were of a grayish colour, with small yellowish masses disseminated through them, and they could be broken down by a comparatively slight force.

The other case was a girl, aged 15 years, who was admitted on the tenth day of the disease, and died on the twenty-second. She had no diarrhœa during her illness, but the bowels were easily moved by laxatives. Two days after admission, she was seized with bronchitis, which was the most prominent local affection during the remainder of her disease. The elliptical patches of Peyer at the upper part of the ileum were defined of a bluish colour, but without any distinct elevation. About a foot above the *caput cæcum*, one of the elliptical patches was distinctly elevated, and of a red colour. A similar patch was placed immediately below this. About five inches above the termination of the ileum, another patch presented itself, more distinctly elevated than the two last described, of a grayish colour, and having two small su-

perficial ulcers on one of its margins. Immediately below this was another patch still more elevated, also of a grayish colour, with several superficial ulcers on its surface. The lower part of the ileum was occupied with a large irregular patch, less elevated than the last described, partly of a reddish and partly of a gray colour, and presenting several irregular superficial ulcers on its surface. Several of the solitary glands at the lower part of ileum were also enlarged, and some of them were ulcerated on the apex. The mesenteric glands were enlarged, but were little, if at all softer than usual.

On examining the Register of Dissections, kept by my predecessor, the late Dr John Home, I find that, between 1833 and the beginning of 1837, the post mortem appearances observed in 101 cases of fever have been entered, in which the abdominal organs were examined. Of these 101 cases, the elliptical patches are described as being well defined or enlarged in 29. In 7 of the 29 a greater or less degree of ulceration of the patches was observed; and in 2 out of the 7, perforation of the intestines had taken place.

It is an interesting and instructive fact, that, though lesion of the intestinal canal is comparatively rare in the fever of Edinburgh, at least for the last several years, the form of fever, as far at least as the post-mortem appearances are concerned, described by Louis and Chomel, is to be found thirty miles from Edinburgh, at Anstruther in Fifeshire. My friend, Mr John Goodsir, Junior, has shown me several preparations of this kind, which he has procured in the course of his practice there, and has furnished me with the following details.

Within the last five years, he has attended in Anstruther and its neighbourhood about 100 cases of fever annually. It is there comparatively a mild disease, for of these only about 16 died. He succeeded in procuring a post-mortem examination in 10, and in every one of these, the elliptical patches of Peyer, and the solitary glands at the lower part of the ileum, were elevated and ulcerated, and in 4, perforation of the intestines had take place. The symptoms attending this form of fever are, lassitude, pain of back and limbs, at the commencement; afterwards the pulse ranges from 90 to 110; there is ringing in the ears, but seldom delirium; a tendency to looseness, but seldom diarrhœa; generally heat in abdomen and groins, and uneasiness on pressure over the right iliac region, seldom amounting to pain; strong pulsation in iliac arteries; generally tympanitic swelling of abdomen; and more or less bronchitis. The greater number of fatal cases occurred in individuals from 13 to 20 years of age. Mr Goodsir has observed the morbid alterations of the elliptical patches of Peyer to pass through the following stages: 1. They are merely slightly elevated, exhibiting an undulatory surface; 2. A number of bluish dots appear

on their upper surface; 3. These dots coalesce into a slough; 4. The slough assumes the form of a cake from one-fourth to one-eighth of an inch in thickness; 5. This cake begins to separate around the margin, so as to exhibit a subjacent ulcer; 6. The cake is separated; the last point of adhesion between the cake and subjacent parts being sometimes at the centre, at other times at one of the edges. The solitary glands undergo the following changes: 1. Slightly elevated; 2. Like a split-pea; 3. Rough appearance on the surface of the elevation; 4. Slight slough on the surface; 5. The central substance drops out, and leaves an ulcer with a hard base. In all these cases, the mesenteric glands were enlarged and softened. In the four cases in which perforation had occurred, this was found to arise from the ulceration of one or more of the solitary glands. The disease was confined in general to the lower three feet of the ileum.

The only other anormal appearances in the intestines which we observed in the 41 cases we have examined were the following. In one case, there were a few ecchymosed spots in jejunum, and in upper part of ileum. In another case, there was a morbid gray elevation adhering to the mucous membrane, about half an inch in breadth, and extending round a considerable part of the calibre of the upper part of the ileum. In a third, there were some old cicatrices at the lower part of the ileum, and there were numerous circumscribed red spots on the mucous surface of ascending and transverse colon, without any decided change of the consistence of the membrane. In a fourth, there were a number of small depressions, with surrounding redness, in the mucous membrane of the *caput cæcum*, ascending, transverse and descending colon. In a fifth, there were a number of small depressions, without surrounding redness or thickening in *caput cæcum* and ascending colon. In a sixth, there were numerous small red patches scattered over the inner surface of the ascending and transverse colon, with slight sponginess and elevation of the parts reddened.

Out of the six patients who died of other diseases while convalescing from fever, the abdominal organs were examined in four. One died on the thirty-first day after the commencement of the disease; another on the twenty-seventh day; a third, on the twentieth day; and the fourth on the thirty-third day. In the three former, there were no cicatrices of ulcers at the lower part of ileum; and in the last, the elliptical patches of Peyer were of a uniform dark-red colour throughout the whole tract of the ileum, were distinctly defined and elevated, irregular on the surface, and at one or two points presented traces of incipient ulceration.

In nine cases only out of the 24 in which the elliptical patches were distinctly visible, were there any abdominal symptoms during life, and in some of those cases these certainly could not be

referred to any affection of the elliptical patches of Peyer. In one of these the patient had retching and diarrhœa on the fifth day of the disease ; this soon subsided, and he died on the 18th. In a second there was epigastric tenderness and tympanitis on the seventh day of the disease, and he died on the tenth. In a third the abdomen was distended and tender. In a fourth there was diarrhœa the day before death. In a fifth there was diarrhœa on the eighth day of the disease, (died on the seventeenth,) and the abdomen was slightly tender on pressure. A sixth had four stools without laxatives two days before death. A seventh had diarrhœa on the eighth day of the disease, which continued up to the time of death, which took place on the fifteenth. An eighth had a tendency to diarrhœa, the bowels being easily and repeatedly moved by laxatives. A ninth, (the case in which red patches in ascending and transverse colon, with slight sponginess and elevation of the parts reddened, were found,) had five stools without medicine the day before death, In the case in which there was diarrhœa for several days before death, there were numerous small ulcers in the large intestines.

In one case in which the elliptical patches of Peyer were not visible, the bowels are stated to have been rather loose, the stools watery and dark-coloured. In other two cases there was considerable abdominal tenderness without diarrhœa.

The following lesions of the *stomach* were observed in the forty-one cases in which the abdominal organs were examined. In three cases the mucous membrane was thickened and mammillated at the pyloric and middle portions. In a fourth case, the mucous membrane of the pyloric extremity of the stomach was slightly mammillated, and it was softened at its splenic extremity. In a fifth case all the coats of the stomach were corroded at the splenic extremity by the action of the gastric juice, and an aperture was found there capable of admitting the points of three fingers. In a sixth the mucous membrane was everywhere thickened, mammillated, and firmer than usual. In a seventh case, the mucous membrane of the stomach presented numerous rounded superficial depressions, with defined margins without thickening or increased redness. In an eighth case, the mucous membrane along the larger curvature near the pyloric extremity was of a red colour, friable, covered with a thick layer of mucus, and presented several small rounded depressions surrounded by a bright-red margin. In a ninth and tenth case, the gastric juice was found to have acted after death to a considerable extent, upon the mucous coat of the stomach at its splenic extremity.

In those cases in which the mucous membrane of the stomach was thickened and mammillated, it was ascertained that the patients

had laboured under dyspeptic symptoms for some time previous to the commencement of fever.

The *spleen* of all the organs in the body was found most frequently in an anormal state, being generally larger than usual, soft, and in some cases almost diffluent. In two cases the spleen was weighed, and in one it was eleven ounces one drachm, and in the other fourteen ounces. In some of the other cases it must have been heavier. In three cases, however, I find it described as presenting its most usual appearance and consistence, and in other two cases it was not increased in size, though perhaps it was softer than usual.

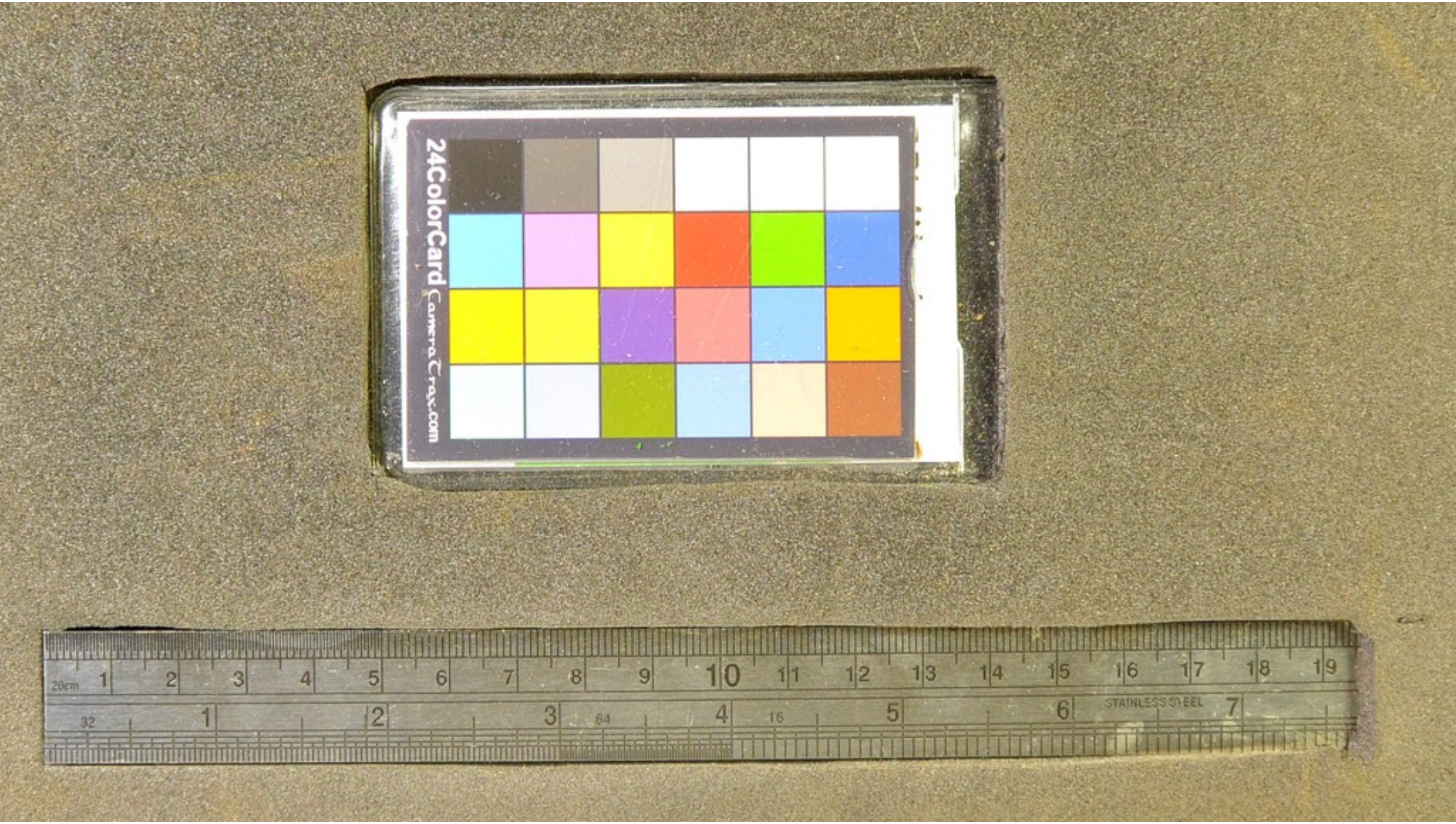
Out of the forty-one cases in which the abdominal organs were examined, the kidneys were found more or less affected with Bright's disease in six : and the *liver* was more or less altered from its normal state in five. In one case in which the liver was apparently quite healthy, the patient had jaundice for two days before death. This had arisen from an arrestment of the secretion of the bile, as all the ducts were quite pervious. These anormal changes of liver were of old standing.

In three cases out of forty-three, the *heart* was in an anormal condition. In one case the inner surfaces of the pericardium were universally and firmly adherent ; in another case the arch of the aorta was dilated with calcareous deposit on its inner surface, and the left side of the heart was somewhat hypertrophied ; and in a third case the free edges of the aortic semilunar valves were thickened, but sufficient for the performance of their functions. In one case there was recent inflammation of the *larynx*.

In all the 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, however small and soft, were found in the right side of the heart. In two cases the blood was found in a grumous state in the right side of the heart ; in one case the right side of the heart contained some dark-coloured coagula ; and in fifteen cases it contained dark-coloured intermixed with decolorized coagula. In two of these cases decolorized clots were also found on the left side of the heart. In several of those cases in which the blood is considered to have been fluid, a few small coagula were found adhering to the *chordæ tendineæ* and *columneæ carneæ* of the right ventricle.

JOHN REID.

PRINTED BY JOHN STARK, OLD ASSEMBLY CLOSE, EDINBURGH.


24ColorCard
CameraCraze.com
20cm
STAINLESS STEEL