

Observations on typhus : abridged from an essay submitted to the Faculty of Physicians and Surgeons of Glasgow in 1840 / by Andrew Anderson.

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OBSERVATIONS ON TYPHUS.

ABRIDGED FROM AN ESSAY SUBMITTED TO THE FACULTY OF PHYSICIANS AND
SURGEONS OF GLASGOW IN 1840.

BY ANDREW ANDERSON, M.D.

THE following observations on our ordinary epidemic fever were made during a residence of two years and a half in the Glasgow Royal Infirmary, eighteen months of which were devoted exclusively to the care of the patients in the Fever Wards.

After having formed a certain acquaintance with the disease by acting for a year as Medical Clerk in that department, the series of observations which are the principal foundation of the present paper was begun, and was continued from Sept. 1837 till Sept. 1838. The observations were conducted in the following manner:—A certain number of cases being selected, their previous history was ascertained as accurately as possible, and the symptoms each day carefully recorded in the tabular form under 23 heads. The chest was carefully explored with the stethoscope, whenever the state of the patient permitted it, and as little as possible was taken on the report of nurse or patient. The cases selected were either those of recent origin, which might be thus traced from an early stage, or such as were particularly severe. In case of death, the greatest care was bestowed on making and recording the inspection.

The cases so traced were 257, or 175 male and 82 female; and of these 65 afforded post mortem examinations. Besides the facts so collected, I have in the following pages made use of those amassed in the ordinary course of my duty as Fever Clerk.

I intend to classify my remarks as follows.—

1. The previous History of those attacked.
2. The Conditions of the Disease.
3. The Mortality.
4. The Morbid Anatomy.
5. The Connection between the Symptoms and principal Lesions.
6. The Complications and Sequelæ.

By Typhus, I mean the ordinary epidemic fever of this country, essentially marked by contagiousness, and by its maculated eruption.

About 1-7th of the cases admitted into the Hospital were not cases of fever; 1-33d of the whole were cases of small-pox.

Who are those most frequently attacked by typhus?

Sex and age.—From my tables it appears that the time of life most prolific in fever is from 15 to 20 for females, and from 20 to 25 for males; a result exactly corresponding to that obtained by Dr. Cowan for the year 1835-6.

Habits.—Of 457 males, 112, or about $\frac{1}{4}$, acknowledged habits of intoxication, which were in 72 occasional only, in 40 habitual; this, it must be confessed, is a pretty fair proportion. We shall afterwards see how the constitution and habits influence the mortality.

Occupation.—Of 500 males, 48 had no trade, chiefly from their tender age. Of 500 females, 118 had no employment or avocation.

Thus, of the males about 1-10th, of the females about $\frac{1}{4}$, had no employment—a difference between the sexes which might naturally have been anticipated. Of the classes of males, that of in-door workers stands by far pre-eminent; and next is that of out-door labourers; while that of those employed in public works, though third in order, furnishes scarce more than $\frac{1}{3}$ as many as the first class. Among the women, on the other hand, mill-workers constitute nearly $\frac{1}{4}$ of the whole, or $\frac{1}{2}$ of those who have a trade; 1-10th of the whole are servants, and $\frac{1}{3}$ married women. Of individual trades, that of weavers among the men, and mill-workers among the women, stand far the first. Among the males, there follow labourers, shoemakers, mill-workers; among the females, servants and weavers.

Previous Febrile Diseases.—Of 828 cases, male and female, 74 stated that they had previously suffered under fever. Of this number, which is nearly 1-10th of the whole, many probably had not had *real* continued fever; but many, on the other hand, who had had it, may, from want of memory or other causes, have denied it; so that this may be, on the whole, a fair enough statement of the case. A few patients said they had eruption on the former attack; this, of course, cannot be taken as proof in the question of the frequency of the recurrence of the disease.

Birth-place.—From October 1837 to November 1838, there were admitted 2,352 cases, Of which there were,

Scotch,.....	1,714.	English,.....	21.
Irish,.....	609.	Foreign,.....	8.

Comparing this with Dr. Cowan's tables, and with the admissions (1,100 in number) during the months November and December 1836, and January and February 1837, we find the per centage as follows:

	1836-7.	1837.	1837-8.	Total.
Scotch,.....	66.10	66.18	72.87	68.71
Irish,.....	31.67	31.45	25.89	29.67
English,.....	2.12	1.18	.89	1.39
Foreign,.....	—	.18	.34	.26

The average of the whole thus approaches very nearly that given by Dr. Cowan for the year of his attendance.

Residence.—This is a question of some importance in ascertaining the chief foci of the disease in the City and Suburbs. Of 1,100 patients, male and female—taken, as in former instances, in the order of admission—the following were the places of residence:—

33 Townhead	8 Ingram Street and vicinity.
17 Dempster Street and neighbourhood.	21 Trongate and Argyll Street.
21 Duke Street and vicinity.	45 Bridgegate.
116 High Street, its offsets, and Salt-market.	20 Clyde Street and Broomielaw.
82 Wynds, Stockwell, and King Street.	6 West End.
72 Gallowgate and vicinity.	441
72 Anderston.	32 Bridgend.
6 Finnieston.	59 Bridgeton.
24 Cowcaddens.	5 Rutherglen Loan.
15 Port-Dundas.	43 Gorbals.
20 Woodside.	13 Hutchesontown.
150 Calton.	6 Laurieston.
19 Mile-end.	47 Tradeston.
4 Dalmarnock.	10 Port-Eglington.
15 Camlachie.	540
Royal Infirmary, - - - - - 9	At Sea, - - - - - 8
Barracks, - - - - - 5	Travelling, - - - - - 2
Town's Hospital, - - - - - 1	10
15	
Villages and Towns to the North, - - - - - 12	
Do. do. South, - - - - - 15	
Do. do. East, - - - - - 35	
Do. do. West, - - - - - 32	
	94

Very nearly $\frac{1}{2}$, then, inhabited the Suburbs, exactly 1-10th the Town proper, and nearly 1-11th Villages and Towns around Glasgow, some being at a considerable distance. Within the Town, the centres of disease will be seen to be the localities which are most densely peopled, and where the greatest misery is known to exist.

In connection with the question of residence, the *duration of the stay in Glasgow*, previous to seizure, is a question of some interest. Of 828 cases, of both sexes,

90 did not reside in Glasgow.
610 had lived in Glasgow for above a year.
128 had lived in Glasgow for a year, or less;—of this number,
3 had been only a week in Town.
4 from a week to a fortnight.
13 from a fortnight to a month.
48 from one to three months.
29 from three to six months.
31 from six months to a year.

Hence it would seem, that recent immigration to Town has some influence in rendering persons obnoxious to contagion or the other causes of fever, or we should not find that of the 738 residing in Glasgow when attacked, 128 (or above $\frac{1}{6}$) had been inhabitants of the City for less than thirteen months; and this would seem to support the opinion, that from the disease occurring once only in a lifetime, the liability of the inhabitants of any one place to be affected, is, after a certain time, worn out; so that the fuel for the maintenance of the disease must be in part supplied from without.

Lastly, the question of *Contagion* falls to be considered; and we may divide the cases of fever into those which had the eruption, those

which had it not, and those in which it could not be ascertained to be present or absent. During the year from October 1837 to November 1838, we had admitted—

		Exposed to Contagion.	
Eruptive,	1,865	907	per cent, 48.6
Doubtful,	143	49	34.2
Non-Eruptive,	344	110	31.9
	2,352	1,066	45.3

Nearly one-half of the cases, therefore, had been exposed to contagion; but of those decidedly eruptive, a greater proportion than of others.

How far *other causes* besides contagion influence individuals, is more difficult to be ascertained; since the attack may or may not have been the consequence of the antecedent exposure. The following Table exhibits the result of my enquiries as to the influence on the propagation of typhus, of the causes more commonly originative of febrile complaints. Of 828 cases admitted in 1838, one-fourth (or 207) attributed their complaint to cold, exposure, or fatigue, in the following proportions:—

To cold alone,	105
Cold, with fatigue or exposure,	71
Fatigue alone,	15
Wet,	13
Sudden changes of weather,	3
	207

If, then, we suppose that in all these cases the exposure was really causative of the disease, we have it so in one-fourth of the cases; but we ought from the 207 to subtract 93 cases, in which there was exposure to contagion besides that to cold or fatigue: this leaves 114, or nearly one-seventh of the whole number; while we have seen above, that exposure to contagion took place in nearly one-half; about $2\frac{1}{2}$ sevenths then remain, in which the patient could assign no probable cause for the attack.

Of the same 828 cases, 415 (or about one-half) attributed their seizure to exposure to contagion; of this number

329, or three-fourths,	had lived in the same house, and
4	in the same ward with affected persons.
68	had had neighbours so affected.
14	had visited a patient, or received the visit of a convalescent.

Hence we find that the great majority of those whose disease arose from contagion had been in constant intercourse with affected persons.

The report of the patients was, of course, of uncertain value in deciding whether the person from whom they supposed they had caught the disease had also the eruption; but of the 415, nearly one-fourth (or 114) stated that such was the case. This is a much greater number than might have been anticipated.

THE INVASION AND SYMPTOMS.—How does Typhus usually begin? Observation as to the date of occurrence of the symptoms in above 60 cases, gave the following results:—

The invasion of the disease is sudden in above half the cases. Of the symptoms noticed in my tables, those which occur in less than half the cases are nausea, pectoral oppression, abdominal pain, and diarrhœa; pectoral oppression and diarrhœa being those most rarely

met with. Anorexia occurred in every case. Those which occurred in more than 9-10ths of the cases were headache, thirst, lassitude, and rigors; the frequency being in the order of enumeration. Those of intermediate frequency were pains and cough.

The symptoms occurring on the first day, in the majority of cases, are lassitude, rigors, and headache. Pains, thirst, nausea, pectoral oppression, abdominal pain, and diarrhoea, occur most frequently on the first day, although in fewer than half the cases. Anorexia is most frequent from the second to the fourth, and cough after the fifth day. Above $\frac{1}{2}$ of the patients took to bed from the second to the fourth day; nearly $\frac{1}{3}$ on the first; $\frac{1}{3}$ on or after the fifth day.

It is not, of course, intended to give a regular description of the symptoms of fever; a few remarks only will be therefore made on some of the most interesting points.

The *Eruption*.—Of the 2,352 cases for the year from Oct. 1837 to Nov. 1838, the proportion of those with eruption to the whole number of fever cases, was 80 to 100. It is, however, to be remarked, that in the first six months, this proportion was greater than in the following ones. In the former, too, the gross number of admissions was greatest; while of cases without eruption, the admissions are nearly the same for each month;—a new proof that since the *eruption* is proportional in frequency to the violence of the epidemic, it must be reckoned one of its most characteristic symptoms.

The day of the fever on which the eruption appears is not easily ascertained in an hospital. I have observed it sometimes on the third, pretty often on the fourth, but most generally from the fifth to the eighth inclusive; occasionally much later. The date of its disappearance was observed in 130 cases; from which it would seem to be most frequent on the sixteenth, seventeenth, and twelfth days.

The persistence, therefore, of the eruption is connected with its intensity, or in other words, with the severity of the disease; for *that* is always in the compound ratio of the copiousness and darkness of the eruption. In the severest cases, the eruption becomes petechial. *Each spot*, instead of disappearing, is fixed under pressure; and dissection shows an effusion, under the cuticle, of blood, the gradual absorption of which gives rise to the changes in colour of the eruption from purplish to brownish red, and then to yellowish brown. These petechiae have a more angular form than the ordinary eruption. The eruption is usually most abundant on the chest, back, and abdomen; more sparing on the legs and arms; rarely seen on the face, hands, and feet. The eruption is necessary to constitute the disease: other symptoms may be absent.

In 65 cases, carefully traced from before the seventh day of the disease, the following results were obtained:—

Almost every case of fever is accompanied by some degree of *bronchitis*; 5-13ths of the whole had increased bronchial secretion, and $\frac{1}{2}$ great engorgement at least of the lungs. The dulness varies very much, and rapidly, from day to day, both in degree and in site, the changes in the lung in typhus being very rapid, for I have seen hepatisation of nearly the whole right lung occur in one night. The

frequently observed faintness of respiration appears to depend, in some cases on weakness, in most, on pulmonary engorgement.

There was suffusion of the *eyes* in all the 65 cases; injection in 38; the pupil was dilated in 17; contracted in 8 cases.

The *fauces* were red and congested in 42; swollen in 3; ulcerated in 2; aphthous in 2; a peculiar vesicular eruption was observed in 20 cases, or nearly $\frac{1}{3}$ of the whole. It generally lasted a day or two, and was frequently succeeded by small dry crusts.

With regard to the *pulse* and *respiration*, I have obtained some curious results. The average pulse of 36 cases, observed daily, and including 415 observations, was 108.5; the numerical frequency of the respiration, 30.5. Both are more frequent in women than in men,—in the former 114 and 34; in the latter 103 and 27, respectively. The pulse and respiration are more frequent in cases with chest complication, than in those of simple fever; and the difference is greater in women; and is also, both in males and females, proportionally greater in the respiration than in the pulse, in the ratio of more than 7 to 1. But not only does this ratio vary with the nature of the disease; in *uncomplicated* cases the respiration is *proportionally* less frequent as the pulse quickens.

The *urine* very seldom offers anything like a cloud at the period of convalescence—much more frequently in the early days. It has, during the fever, a regular progression in point of density, acidity, and the quantity of uric acid, these being all at first great, and gradually lessening to a minimum, which in the case of uric acid is nothing; after which they rise gradually as they fell. The acidity about the 14th to the 17th day is so slight, that on standing a very short time the urine becomes alkaline from decomposition.

In 130 cases, *convalescence* occurred before the 25th day in 112, or above 86-100s; from that date to the 35th, in only 18, or 14-100ths of the whole. Of periods of 5 days, then, that in which most cases convalesce, is that from the 15th to the 19th day inclusive; of those of 3 days, those from the 16th to the 18th, and from the 19th to the 21st; next to them being that from the 13th to the 15th days.

The date of *death* was observed in only 94 cases; of periods of 5 days, the most fatal is from the 13th to the 17th; the next that from the 8th to the 12th. Of periods of 3 days, that from the 11th to the 13th is most fatal, and is followed by those from the 14th to the 16th, and from the 8th to the 10th. Of the periods of 5 days, therefore, that most fatal is also that in which most patients convalesce.

Numerical Mortality in fever:—

I.—With reference to Age—for the year 1837–8.

Age.	Admissions.	Deaths.	Age.	Admissions.	Deaths.	
1 to 5	20	4 or 1 in 5	50 to 55	42	13 or 1 in 3.2	
5 to 10	138	6	55 to 60	16	6	2.7
10 to 15	261	10	60 to 65	17	5	3.4
15 to 20	460	35	65 to 70	11	9	1.2
20 to 25	445	26	70 to 75	3	1	3
25 to 30	297	37	75 to 80	1	0	0
30 to 35	246	38	?	12	8	1.5
35 to 40	179	36		—	—	—
40 to 45	142	33				
45 to 50	72	25				
		2.9	Total,	2352	292	8

II.—With reference to Sex—for the same year.

Sex.	Admissions.	Deaths.
Males,	1431	166 or 1 in 8.6
Females,	921	126 7.3
Total,	2352	292 8

—For the months Nov. 1836 to Feb. 1837.

Sex.	Admissions.	Deaths.
Males.	550	79 or 1 in 6.9
Females,	550	64 8.6
Total,	1100	143 7.7

III.—As to Eruption—for 1837–8.

	Admissions.	Deaths.
Eruptive,	1885	275 or 1 in 6.9
Doubtful,	62	6 10
Non-eruptive,	141	11 12.8

—For the months Nov. 1836 to Feb. 1837.

	Admissions.	Deaths.
Eruptive,	778	119 or 1 in 6.5
Doubtful,	84	13 6.4
Non-eruptive,	238	11 21.6

IV.—With reference to previous Habits.

	Admissions.	Deaths.
Habitual Drunkards,	140	14 or 1 in 2.8
Occasional do.	112	27 4.1
Sober,	262	33 7.9

Those under 15 years of age are excluded.

Thus the mortality is great under 5 years; is very small from 5 to 15; nearly twice as great from 15 to 25; again almost doubled from 25 to 35; and afterwards increases with the age. The two Tables give opposite results with regard to the mortality of the sexes. The deaths are much more numerous in the eruptive, or true typhus, than in the non-eruptive cases. Lastly, we perceive the fatal effects of habits of intemperance, in increasing the chances of death from fever.

THE MORBID ANATOMY.—The lesions occurring in simple fever, and attributable to that disease alone, are to be distinguished from those which are superadded to it.

Thus, in 189 inspections, there was inflammation in the head in 12 cases, 247 chest, 60
..... tubercle of the lungs, 4
240 inflammation in the abdomen, 40

Let us review the lesions of the various organs in *pure Typhus*.

I.—The Nervous Centres: 52 Inspections.

The *arachnoid* lining the *dura mater* is frequently reddened in dots and minute parallel striæ, as we find on the peritoneum and on false membranes. The veins external to the *spinal sheath* are frequently engorged, and seen crossing the sheath in the way figured by Breschet.

Congestion and effusion into the *pia mater* occur in about the same number of cases; redness of the *arachnoid* lining the *duramater* is

generally coincident with effusion into the upper part of the serous cavity, which occurs in only half the number of cases in which effusion at the base does. This effusion in the arachnoid on the surface of the brain is not so rare as has been asserted, since it was found in 21 out of 52 cases. Of the same cases, 48 presented effusion into the lateral ventricles, and 35 subarachnoid congestion of their surface; there was effusion into the fifth ventricle in 2, into the fourth in 17 cases. The substance of the spinal cord was in all cases natural.

II.—*The Respiratory Organs: 54 Inspections.*

Congestion of the *larynx* is more frequent than the existence of mucus in that cavity, but less frequent than congestion of the *trachea*; since the first occurred in 3-5ths, the last in 4-5ths, of the cases. In 2-5ths of the cases mucus was found in the larynx and trachea, and in the same number the *pleura* was congested. Effusion into the pleura was very rare, being found in four cases only. The redness of the trachea was generally greatest in the interannular spaces, on the membranous portion, and just above the bifurcation. The *bronchi* were congested in proportion to the engorgement of the lung; and the redness, except in pneumonic cases, stopped at the small ramifications.

Reckoning both lungs in each subject, we find them healthy in 22, and congested in 75; more frequently congested than healthy, in the proportion of 3.5 to 1; and most frequently congested behind, as also indicated by the stethoscope during life. The cases of great, bore to those of slight and moderate congestion, the proportion of 7 to 9. The lung was occasionally seen of a florid red colour, though in texture natural. The cases in which the lung was hepatized have been excluded from this computation, being considered as complicated; in 249 cases inspected, there were 44 in which the lung was hepatized. The lung designated as "flabby" is tough, dark, and ponderous—seems almost peculiar to the typhoid state—and has for its physical sign a peculiar raucous sparing crepitation, which I have not seen noticed.

Great congestion of the pia mater of the brain occurred in above half the cases of hepatization; in less than half those of great congestion; and in about 1-5th only of those in which the lungs were scarcely or not at all congested.

III.—*The Organs of Circulation: 52 Inspections.*

While the great majority of cases presented effusion into the *pericardium*, 1 only had that membrane congested. The effusion was bloody in 2, and turbid in 3 cases. It was found in 46 out of 48 inspections; and as to quantity, would seem to be independent of the time which had elapsed between death and inspection.

The heart was found quite empty in only 1-14th of the cases; and the left much more often so than the right side. Fibrinous clots occurred with about equal frequency in both ventricles, but more generally in one than in both. They are the contents most usually found in the cavities.

IV.—*Organs of Digestion: 53 Inspections.*

The congestion of the mucous membrane of the *pharynx* is often bounded inferiorly by a well-marked horizontal line. The glands of the *oesophagus*, when enlarged, are seen arranged in longitudinal rows;

and a frequent appearance on the mucous membrane is that of an aphthous-looking coating, ceasing abruptly at the cardiac orifice.

The mucous membrane of the *stomach* frequently presents an aspect (follicular) as if divided into a countless number of polygonal plates, often having each a red dot in the centre. In some cases, aphthous lines are seen stretching longitudinally from cardia to pylorus. The mucous membrane of the cardiac cul-de-sac is generally thinner and of a yellower colour than that of the pyloric end, from which it is often separated by a well-marked line.

Moderate softening of the mucous membrane of the stomach occurs with equal frequency at the cardia and pylorus, but a pulpy state of the membrane is much more frequently found at the former; and both degrees would seem to be most commonly found after the lapse of 30 hours after death. A red colour accompanied the softening in nearly half the cases in which it occurred. The softening is most frequently also accompanied by thinning of the membrane at the cardia, but by thickening at the pylorus. The membrane is of natural thickness in half the cases in which the cardiac, in three-fourths of those in which the pyloric part, is softened. Submucous congestion is most frequent at the cardiac, development of the follicles at the pyloric region.

The congestion of the mucous membrane of the *duodenum* is in minute parallel lines, running transversely to the *valvulae conniventes*. The granular look, frequent just below the pylorus, is caused by the development of the glands of Brunner, which are not follicles in the mucous membrane like those of Peyer, but small isolated glands, resembling the pancreas in structure, and lying quite under the mucous layer.

The vascularity of the *peritoneal coat* of the *small intestine* is in hairlike parallel lines, connected by transverse anastomosing branches; and there are, besides, veins which arch from the mesentery over the intestine, tortuous, and branching dichotomously at large angles close to the serous surface. The mucous membrane itself is more rarely congested than the submucous tissue; the veins of the villi are single in each, running up the centre of the villus, often found filled with blood; while there is not rarely an ecchymosis at the extremity of the villus, which is supplied by several arterial twigs capable of being injected. For a description of Peyer's and the solitary glands, I refer to Müller's Physiology; on their pathological appearance I shall merely make one or two remarks.

The villi being more vascular than the roofs of the follicles, the Peyer's gland when congested has a mottled appearance; the prominence above the mucous membrane of the aggregate gland is in many cases formed merely by a swelling of the villi, which become enlarged and flattened; in others, however, there is thickening of the cellular tissue, with induration and increased vascularity. In this manner the gland may project a couple of lines,—an appearance which became rather frequent, from what cause I cannot tell, during the winter of 1838-9, having previously been very rare. A gland so elevated may also become ulcerated; that complication beginning by a deposite of a white matter in one of the follicles, the roof of which

ulcerates, the cavity becoming the nucleus of a small round ulcer, which spreads gradually and irregularly, but never reaches a great size, nor does it become inflamed or sloughy, but rather slowly eats away the surrounding thickened cellular tissue. The rapidly spreading ulcer, on the other hand, begins without previous elevation of the gland, and more generally in a solitary than in an aggregate one: a tendency to rapid spreading, and to inflammatory action, are its characteristics; it frequently exposes the muscular tissue or perforates the gut, and is surrounded by a margin which is well defined, whether it be red and angry, or pale and indurated, or elevated, rugged, and everted, or undermined. The bottom also often presents the sloughy yellow-looking matter in which saline crystals are found. These ulcers often resemble in every respect those found in cases of phthisis; in both, contrary to what has been asserted by some, they have, when affecting a Peyer's gland, a longitudinal direction.

Black puncta, surrounded by dark areolæ, characterise the disease affecting the large intestine; the areola is merely a dyeing of the mucous surface, but a vascular circle is sometimes also observed. The gland is sometimes swollen to the size of a pea, generally scarcely at all. The vascularity of the mucous membrane is generally very minute in the great gut; that of the submucous tissue appears in large bluish ramifications.

Small Intestines of 55 Cases.

All the parts of the small intestine are nearly on a par with regard to injection of the peritoneal tunic, excepting the lower part of the ileum, which more rarely presented that appearance. Softening of the membrane was least frequent in the same part, and in the duodenum; most often found in the lower half of the jejunum, and upper two-thirds of the ileum. The same may be said of engorgement of the submucous veins, or those which ramify in the cellular tunic, and also of injection of the vessels of the mucous membrane itself; except that in the latter respect the upper half of the jejunum was less often affected than the lower third of the ileum. Enlargement of the follicles, whether solitary or aggregate, was most frequent in the lowest portion of the ileum; somewhat less so in the second half of the jejunum; and of about equal frequency in the remainder of the ileum. The upper half of the jejunum presents them in about half the number of cases in which they are found in any of the other portions, except the duodenum, in which they occur six times less frequently. In the last named part Peyer's glands are very rarely found; they are generally most numerous in the first, as solitary glands are in the last third of the ileum. In 10 cases the Peyer's glands were injected with blood, and usually surrounded by radiating vessels; in 5 cases, ulcerated.

The vascularity of the Peyer's glands was in only about half the cases coincident with much congestion or softening of the mucous membrane; and ulceration of the same follicles was as little an index to an inflamed or softened state of that tissue.

The contents of the duodenum and first half of the jejunum are generally yellow mucus; yellow, dark brown, and light brown, are the prevailing colours of the contents of the rest of the gut.

Congestion, both mucous and submucous, is most frequent in the cæcum; next to the cæcum come the ascending colon and the rectum for submucous, while mucous congestion is found in the colon and rectum with nearly equal frequency. Softening of the mucous membrane occurs oftenest, and to the greatest extent, in the cæcum, and next to it come the transverse and ascending colon. Next to the appendix, the descending colon is most frequently found empty; and yellow fæces are the most ordinary contents of the large intestine.

The following is a general view of the lesions of the gastro-intestinal mucous membrane in 74 cases:—

	Soft.	Follicular.	Peyer's Glands.	Solitary Glands.	Brunner's Glands.	Ulcers.
Stomach, -	57	21	0	0	0	0
Duodenum, -	18	0	1	2	4	0
Jejunum, -	38	0	62	4	0	0
Ileum, -	45	0	68	26	0	0
Cæcum, -	45	0	0	11	0	5
Colon, -	38	0	0	27	0	4
Rectum, -	21	0	0	10	0	1

The liver was soft in five cases; of which three had hepatic, one portal, and one no congestion.

The congestion of the liver is hepatic in twice the number of cases in which it is portal; both species were observed to exist together in different parts of the same liver, in half as many cases as those in which the portal congestion was found. Does the superior prevalence of hepatic congestion depend on the blood being returned less freely from the congested intestine?

The bile in 61 cases. It appears that while it is more usual to find it dark than light, and much more frequent to find it thin than thick, and while dark bile is as frequently thin as thick, yet light coloured bile is almost always thin. In one case only out of 32, was the bile in the ducts darker than that in the bladder; of the rest, one-third presented it of the same, and two-thirds of a lighter colour in the ducts.

In proportion to the number of cases, lobular congestion of the liver coincides most frequently with bile of a dark and thin, and of a light and thick character; while with interlobular congestion coincides most frequently dark and thick, or light and thin bile.

The Pancreas is rarely further changed than by congestion of the mucous membrane, which occurred in less than one-third of the cases.

The Thoracic Duct was examined in 9 cases; in 1 only was it found to contain any fluid.

The spleen was natural in less than one-tenth of the cases inspected. The most frequent lesion is softness, and next to it, alteration in size; that of colour is the most rare, occurring in a little more than 1-12th, while change in consistence is found in nearly $\frac{2}{3}$ of the whole number of cases. Large size, dark colour and softness, coincide most frequently; as, on the other hand, small size coincides with firmness and a pale colour.

The consistence of the spleen seems to have no fixed relation to the time of death.

V.—*Urinary Organs*: 53 cases.

Congestion of the pelves and ureters generally appears in the form of spots, lines, and patches. On the mucous surface of the bladder are frequently seen sloughy-looking patches, which are in reality small masses of epidermic scales—the increased secretion of the mucous surface, which in these cases is generally of a dark red.

The kidneys were flabby in 4 cases.

COMPLICATIONS AND SEQUELÆ.—To judge from those occurring in 2,352 cases, admitted from October 1837 to November 1838, the most common are the following, arranged in the order of frequency:—

- Erysipelas.
- Pneumonia.
- Inflammation of Glands (Salivary).
- Sloughing.
- Laryngitis.
- Pleuropneumonia.
- Affection of Intestinal Glands.
- Inflammation of Fauces.
- Hemorrhages.
- Abscesses.
- Otitis.
- Glossitis.
- Peritonitis.
- Intestine Ulceration.

A few of the most important of these complications may be separately noticed. Most of them are ushered in by rigors, occurring very soon before the attack; and some, as jaundice, pus in joints, &c., are accompanied by great prostration.

Erysipelas most frequently attacks the face; when on the body it is generally wandering and superficial—the affected part being of a paler yellow colour. Head affections are the most common in cases of *Erysipelas*; and next to them are those of the throat and chest.

A case of *Cancrum Oris* after fever, was accompanied by pneumonia and follicular disease of intestine; and one of abscess, gangrene, and sloughing in the temporal region, by inflammation and ramollissement of the brain, and effusion of pus into the sphenoid sinuses.

Synovitis occurring after fever was, more generally than *erysipelas*, accompanied by delirium. The synovial membrane was generally red, and the effusion, as determined by acupuncture, was at first clear and transparent—puriform in the latter stage alone. Another set of cases, with suppuration of a joint, differed in being accompanied by slight redness of the membrane, and generally by jaundice, while the effusion never presented a serous character, and was scanty; and the symptoms were generally rapid sinking, and muttering delirium. There were very frequently other serious visceral lesions.

One of the most troublesome of the complications and sequelæ of Typhus, particularly in erysipelatous cases, is *Laryngitis* in its various forms. The simple *œdema of the glottis* and surrounding mucous membrane is the most rapidly and certainly fatal, if the patient be left to himself; but if treated early and judiciously, is far from being the most formidable. The easy and effectual remedy, as I have proved in two cases, is a vertical division of the cricothyroid membrane, and of the

cricoid cartilage, the opening to be kept patent by a bent wire in preference to a tube. If the opening be not free, or if it be too long delayed, pulmonary and cerebral congestion will render success very doubtful; if there be inflammation of the mucous surfaces and glands around, the operation is of very doubtful propriety. Erysipelas, abscess behind the pharynx, and vesicular inflammation of the fauces, are frequent and formidable complications of this disease. The œdema is sometimes confined to one side; in which case the patient generally lies on the affected side, to prevent the flap of mucous membrane from falling into the glottis. This accident I have seen the cause of sudden death. In inflammation of the *parotid* and other salivary glands we generally find only induration and enlargement of the lobules; sometimes infiltration of bloody serum or of pus. The sublingual mucous fold, where the ducts of the gland open, is frequently swollen, forming a sort of crest under the tongue.

To the above enumeration may be added *glossitis*, and sloughing of various organs. Temporary attacks of *mania* and *hysteria* I have observed as sequelæ of Typhus.

Of 19 cases of Typhus complicated with *pneumonia*, both lungs were hepatised in 10; the right alone in 5; the left alone in 2 cases.

A description has already been given of the ulceration of the intestinal mucous membrane; we have now to consider whether it be proper to, or a complication of, Typhus. Its characteristic symptoms are, first the long duration of the disease, death rarely occurring before the 30th day; while we have seen that in pure Typhus the majority of deaths happen before the 17th. A peculiar harshness of skin, partial flushing of the cheeks, or a sunk look of intense anxiety; restless, not muttering, delirium, with frequent meteorism, form the chief symptoms peculiar to this affection. Cough, hiccough, and occasionally vomiting, may be added; the delirium frequently ends in stupor; and in 4 out of 12 cases, there was abdominal pain, not however to a great extent, nor is it generally so, except on the supervention of peritonitis. Diarrhœa was present in 5 cases. In some cases there is scarcely any symptom of a serious appearance, till fatal peritonitis follows the sudden perforation of the gut.

When follicular disease of the intestine occurs as a complication of the Typhus, there is generally merely an increased violence in the ordinary symptoms of the fever, particularly the delirium, and frequently the complication of some external affection; thus of 15 cases, 10 had erysipelas, and 1 cancerum oris. In 2 cases hiccup was remarked, and in 2, or 1-7th of the cases, diarrhœa; while of the pure intestinal cases, nearly $\frac{1}{2}$ presented this symptom. The head affection, too, is more frequently stupor, or violent delirium, than the anxious excitement or depression we have already mentioned. Pain of the abdomen was observed in one only of the cases, excepting those of peritonitis. The duration of the disease is less, usually under 20 days.

In one case of pure intestinal disease an eruption like that of Typhus appeared on the 24th day; in most there was no eruption; in one or two a few slightly elevated spots, having somewhat the character of those observed in the *fièvre typhoïde* of the French.

I think no one who examines the facts I have given can doubt that intestinal disease is by no means a necessary—is in truth comparatively a rare concomitant of Typhus; if we except that congestion, which, being found in every organ, is no more necessary to Typhus than is cerebral, pulmonary, or hepatic congestion, all of which, though generally present, and producing certain symptoms, are so in varying degree, and sometimes not at all. The symptom of great cerebral congestion is stupor; that of pulmonary engorgement, dyspnoea; while congestion alone, either of the intestine or of the liver, appears to have no peculiar symptom. If instead of congestion, follicular disease occur, in its early stages it is still unmarked by any change of symptoms; when it has proceeded to ulceration, or is rapidly passing to that state, what are those which characterise it?

We have seen, then, in the cases uncomplicated with Typhus, that it is marked by languor, restlessness, flushing, occasional diarrhoea, and the protracted nature of the disease; when Typhus is present, these symptoms are by no means so well marked; is the disease then essentially different in the two cases? Have we one follicular disease peculiar to Typhus, and another constituting the *fièvre typhoïde*? I think not; and my reason will be illustrated by comparing these complications of Typhus with those with chest disease. All know the symptoms of idiopathic pneumonia; how are they changed, if the pneumonia occur in Typhus fever? Often so much, that the disease would, but for the stethoscope, be apt to escape notice; everything masked by the typhoid state; no sputa, no cough, but little apparent dyspnoea; no pain, and no complaint. So in the intestinal disease,—but rare complaint of pain; diarrhoea less frequent; the anxious restlessness masked by stupor. In both cases we have a *mixture* of Typhus and a local disease, in which the peculiar symptoms of the latter are obscured by those of the constitutional affection, so as to give rise to a set of symptoms belonging properly neither to the one nor the other. Typhus, then, is as distinct from intestinal lesion as from pneumonia, although both these diseases, when approaching the fatal termination, assume typhoid symptoms.

Typhus is a pure fever, of intensity varying from the mildest febrile state to the most severe; characterised by contagiousness and eruption. It may kill without a lesion detectable by the eye; is usually accompanied by congestion of various organs, particularly of the lungs; but it may be complicated with local lesions of a more permanent nature. These may begin along with the fever, occur in its course, or follow on its subsidence. In the first case, both complaints arise from the same cause (if it be not contagion); in the second, the supervening complication may depend on the fever, as pneumonia on the long-continued position on the back; in the last, the sequela generally follows an error in regimen, or exposure to cold in the peculiarly sensitive state of the frame which exists after fever.

SYMPTOMS IN CONNECTION WITH LESIONS.

I.—Of 18 cases dying with marked HEAD symptoms, distinct lesions were found in the head in 10; and from this we should conclude that marked head symptoms were, in the majority of cases, indicative of

cerebral lesion. On examining, however, likewise those cases in which there were no head symptoms, we obtain an unexpected result—viz. that of the cases with marked delirium or stupor, a smaller proportion had effusion into the arachnoid or piamater, than of those who had during life no delirium. In the same way we find that a smaller proportion of the cases with marked piamatral effusion had marked delirium, than of those with little or no effusion. Lastly, of those with arachnoid effusion, we still find that those with much effusion included the smallest number of delirious cases, although that proportion was greater in those with moderate than in those with no effusion. These results are extraordinary, and to establish them would require a much larger induction than mine; I however did not choose to quote cases from the journals for the sake of enlarging their number, not being able personally to vouch for their accuracy. However, when death was preceded by *sudden* stupor, lesion of the head was in the majority of cases detected.

II.—In cases where there is no PULMONARY lesion, cough and expectoration are less frequent than where the lung is congested, and in the last case they are in the same proportion less frequent than when hepatization has taken place; troublesome cough, however, occurred in less than half the cases of hepatization, and the sputum was bloody only in one case. The cough and expectoration, therefore, afford some aid in detecting pulmonary lesion; but the stethoscope must be chiefly relied on. And I would also propose, as a means of diagnosis, the *frequency of the respiration*, as compared with that of the pulse; which I have already shown to be much greater in cases complicated with chest disease than in those which are not.

III.—With regard to the state of the STOMACH in connection with that of the Tongue, the only conclusion which would appear legitimately deducible from my tables is, that a brown or blackish dry tongue is frequently indicative of a reddened and softened state of the gastric mucous membrane.

IV.—HICCUP seems to be always, or almost always, the indication of some serious visceral disease; and the same remark may be made of jaundice in fever, there being this difference, however, that hiccup is generally observed during the fever, jaundice on the supervention of some complication.



