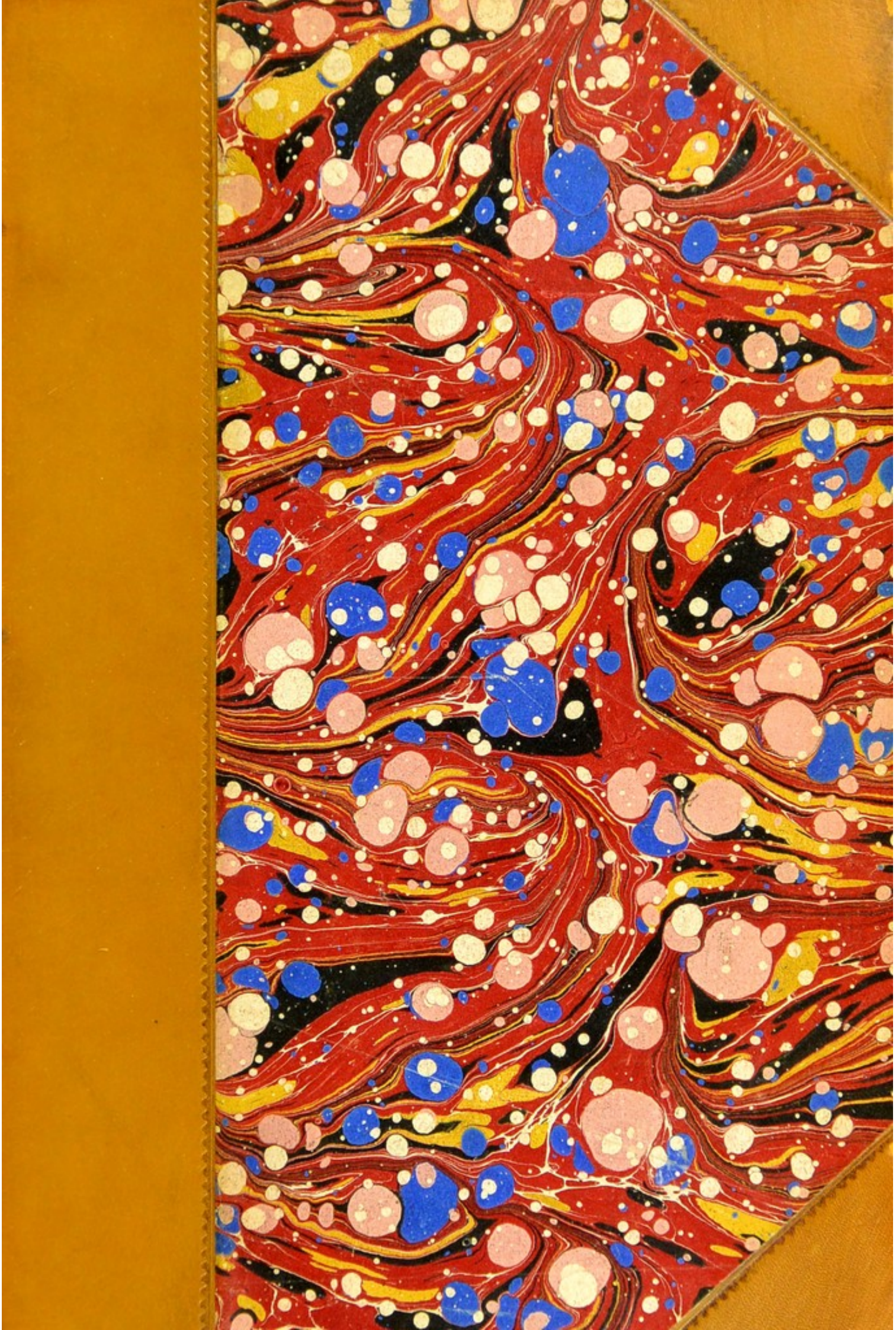
On a Peyerian ulcer-lesion of the small intestines, apparently new / by H. Vandyke Carter.



ON

A PEYERIAN ULCER-LESION

OF

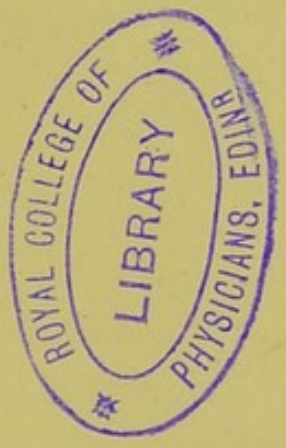
THE SMALL INTESTINES

APPARENTLY NEW.

BY

H. VANDYKE CARTER, M.D. (LOND.)

BRIGADE-SURGEON H. M. INDIAN ARMY.



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ON A PEYERIAN ULCER-LESION OF THE SMALL INTESTINES, APPARENTLY NEW.

By H. VANDYKE CARTER, M.D. (Lond.), Brigade-Surgeon, I.M.D.; Principal and Professor of Medicine, Grant Medical College, and First Physician, Sir Jamsetjee Jejeebhoy Hospital; Dean of the Faculty of Medicine, University of Bombay; and President of the Medical and Physical Society.

Memoir presented to the above Society in May, 1886, *and subsquently augmented.*

Introductory Remarks.—My attention was first directed to this subject in February last (1886), by the occurrence at the Goculdas Tejpal Hospital (then under my charge) of the remarkable case described below as No. 1; and subsequently at both that hospital and the larger Jamsetjee Jejeebhoy Hospital, I have omitted no opportunity of making or seeing the autopsies of all kinds available. Some of the results of this enquiry were communicated to the Society in May, and to these are now (November) added other fresh cases; the accumulated total of 11 examples, both continuous and unselected, amounting to evidence of no great infrequency of the lesions in question. As two characteristic instances come from for inland country districts, there is proof that such are not limited to the Presidency town. The subject will still continue under investigation, but enough is here submitted to assist other enquirers in the same direction. At present all that I advance is, in the absence of real Typhoid, the occurrence of a connate if manifold form of ulceration in the mucous membrane of Jejunum or (much oftenest) the Ileum, which by preference involves the area of "Peyer's patches," and probably also the "solitary glands"

so-called; the lymph-follicles themselves not, however, being implicated so early or markedly as the sub-mucous connective tissue, in which the destructive changes seem to begin as a localised blood-stasis or irritative blood-infarction. The clinical symptoms, though febrile and serious, have not been of uniform or always of unmixed character; and they indicated the presence of the intestinal lesion only when peritonitis, or perforation, had supervened. Usually the ulcers ensuing upon necrosis are all much alike, and being of small or moderate dimensions even when multiple, might not produce urgent local signs, except when deeply penetrating; and besides, often being comparatively inconspicuous, they may sometimes have been overlooked at autopsies not made with particular attention to the state of the intestinal mucous "glands." This is a point of considerable importance, and well worth remembrance at all autopsies of infection-diseases.

If my preparations correspond to certain Museum-specimens of "perforating ulcer" mentioned in the APPENDIX below, it would appear that the presence of a lesion may during life remain unindicated and unsurmised until hæmorrhage (melæna), peritonitis, or perforation of the bowel suddenly supervene; but in the absence of fully detailed information, such corresponding identity is as yet uncertain. Hitherto I have not been able to meet (in a small library) with any published detailed account of Peyerian ulcers—either European or Indian—which wholly answer to this Bombay series; and therefore some pains have been taken to elucidate the subject by means of these independent data, the sub-title above "apparently new," expressing merely a personal experience.

The illustrations appended are as faithful as could be made, under available local conditions.

Plan of this Essay.—I propose under PART I. to describe the facts at disposal as displayed in the *Cases* themselves, beginning with the simpler and perhaps more characteristic ones. All the subjects were native males, the proportion of female patients in a Native General Hospital being always small: usually, too, patients come late, with an imperfect previous history, and on

account of prejudices only the bodies of the wholly friendless are as a rule available for autopsy. Only cases with an autopsy are here recorded, and they are all of the kind seen, without any exclusion. A *List* and a brief *Analysis* precede the cases, which are followed by *Clinical Charts* and *Comments*; and also by a *Summary* of the Intestinal changes, and a *Tabulated view* of the Peyerian ulcers as contrasted with those of "enteric" fever.

Next under PART II. will be discussed the *Identification*, *Histology* and *Pathogenesis* of the Lesions; the materials for judgment being given as concisely as possible.

Lastly, a literary retrospect of the subject follows, as APPENDIX to the original data.

PART I.

LIST and short Analysis of the Cases, with their co-relationships.

No.	Caste and Diet.	Age.	Name of Disease and Date on admission.	Duration of illness.	Ulcer-lesions.	Complications—Etiology.
1	Hindu, Vegetarian.	20	Remittent Fever from 9th day.	18 days	About 20 ulcers, end of ileum.	Death from perforation of gut: no other lesion. A town-resident, cook. Etiology obscure.
2	Hindu,Mixed.	22	Remittent (Enteric?) Fever from 3rd day.	15 days	About 17 ulcers, end of ileum.	Death from perforation of gut; no other lesion. A prisoner in district jail. Etiology obscure.
2	Hindu,Mixed.	20	Remittent (Enteric?) Fever from 5th day.	43 days.	About 40 ulcers, end of ileum.	Death from perforation of gut: no other lesion. A regimental recruit. Etiology endemic?
3	Hindu, Vegetarian.	21	Remittent Fever from 10th day.	(?) 18 days ...	About 20 ulcers, end of ileum.	Gangrene of lung: splenic infarcts. A town-resident, ill-fed. Etiology obscure.
4	Christian, Mixed.	30	Remittent Fever after 15th day.	24 days	About 10 small ulcers: ileum.	Asthenia: diarrhœa: no other marked lesion; resident in suburbs, (?) malaria.
5	Hindu, Vegetarian.	40	Remittent Fever (?) after 20th day.	(?) 24 days ...	About 30 ulcers, end of ileum.	Pneumonia, hæmorrhages, cæcum inflamed; a town-resident, intemperate.
6	Hindu,Vegetarian.	35	Remittent Fever (?) after 20th day.	(?) 21 days ...	1 ulcer in jejunum..	Acute dysentery, petechiæ. Collapse. Town resident, habits (?)
7	Hindu, Vegetarian.	35	Cholera (?) Enteritis (?) 3rd day.	(?) 7 days ...	About 12 ulcers, end of ileum.	Pulmonary apoplexy, Croupous exudations. Town-resident. Etiology obscure.
8	Christian, Mixed.	30	Remittent Fever from 10th day.	(?) 17 days ...	1 ulcer at end of ileum.	Jaundice, dysentery. Town-resident; intemperate.
9	Musalman, Mixed.	20	Sloughing ulcer on foot, 2 months standing.	12 days in hospital.	1 ulcer at end of ileum.	Acute dysentery, perforation of cæcum. Pyæmia? Pauper-immigrant.
10	Hindu, Vegetarian.	56	Chronic diarrhœa, (opium-eater), 6 weeks ill.	3 months ...	About 12 ulcers end of ileum.	Chronic abscess. Dysentery. ? Pyæmia. Malaria.

* *This case arrived too late for incorporation with the rest.*

Analysis.—The above are a continuous and unselected series, whose only bond of union here is the ileac ulcer-lesion apart from other disease noticed during life or after death; but the previous history was often very scanty and obscure. The above arrangement is almost an arbitrary one. This List shows—*a.* No exclusive predominance of *Caste* or of one form of *Diet.* *b.* An *age*-range of 20—40 years. *c.* "Remittent Fever" as a common designation of patient's ailment on admission, the term being then sometimes indefinitely used for a briefly seen febrile state and upon report. *d.* A mean *total duration of illness* of about 18 days in the 8 febrile cases, the first two being valid data: my impression is, that within but a very few days before death, the intestinal lesion had supervened in any of these cases, having no uniform time-relation to the periods of illness so far as ascertainable; the guiding-clue of local abdominal signs was always defective, and judgment of time could be made only from the aspect of the lesions themselves. For the same reason it is not known with certainty, whether or not survivors suffer from lesions of the kind under review; apparently all who are thus affected die, and hence the very serious indication of the lesions becomes evident. *e. The number of ulcers* varied from 1 to 30, the mean number being over 12; concomitant lesions in the small intestines or elsewhere, may or may not be present. The site in 9 cases out of 10 was towards or at the end of the ileum; once a single ulcer was a found alone in the jejunum. And their common feature was their location in Peyer's patches, nearly if not quite exclusively at least at beginning; and doubtless the isolated lymph-follicles may also be primarily implicated. Other structures of the mucosa may or may not be involved, more or less, and either in connection with the ulcer or separately. The aspect of all these ulcers had a generic resemblance, imparting the idea of a common mode of origin, whatever the other attendant conditions might be. *f. Death* in 2 cases ensued as a direct consequence of the ulcer-lesion, from perforation of the bowel; in 1 case there was fatal asthenia, in 3 cases severe lung complication, and in 4 cases concomitant acute dysentery: under

all these varying circumstances I still infer the operation of some special influence, which might have been of a septic character affecting the blood. *g.* The *Etiology* was never clear, but insanitary (*i.e.* filth or pythogenic) agencies possibly always intervened (except perhaps in No. 2, from a well-kept country jail); no connection was traceable with other sporadic, endemic or epidemic instances outside hospital, but enquiry was inevitably imperfect and more material is needed to determine this point. (*Vide* Case 2*.) Particular difficulties exist here, because this lesion is not a frequent one, and it may I know be absent in the great majority of fatal "Remittents," whether complicated with local inflammations or seemingly uncomplicated: see next heading. *h. Accompanying local* and *general states.* A special malarial influence is not by any means strongly indicated, *e.g.*, as estimated by weight of *Spleen*—thus, in the order above of cases, the spleen weights were in ounces successively 8, 30, 13 and 9; 7, 7, 8 and 8; 8 and 6½; as by far the majority of these numbers do not exceed the weight of the spleen in fatal common diseases here, it may be assumed that unusual malarial turgescence of this organ is not usually connected with the production of these ileac ulcers. The spleen of No. 2 weighing 30 ozs. was apparently an old 'ague-cake' (Dr. Damania), and therefore of prior independent origin. Commonly the remark at autopsy is that the spleen is normal-looking, even as regards the pulp of the organ: only twice did I notice pale infarct-like areas, viz., in No. 3 (with lung-gangrene) and in No. 5 (pneumonia and petechiæ) when other lesions were also present, but they may not be noted even under such conditions; and in the typical uncomplicated case No. 1, the spleen seemed to me specifically unchanged in its coarser aspect. Since the *Liver* also did not appear to be affected in any peculiar manner, it will suffice to mention here the general condition of this organ, following the same order of cases in the list above—weights, in ozs., 38 unchanged, 67 ozs. (?) malarious (Dr. D.), 44 deep yellow and flabby; 49, a pale infarct (?); No. 5, 60 ozs., pale infarct (?), 48 cirrhosis; 38 fatty (?), 72 palish; Nos. 9 and 10, 36 and 30 both

unchanged. With respect to the *Renal organs*, analysis of the records does not reveal any particular change of a uniform kind in the kidneys. The *Brain* was examined in Cases 3, 5 and 8, and no particular uniform lesion found. I have not observed any special constant change in the condition of the *Heart*. A review however of the state of the *Lungs*, as well as of the large *Intestine*, leads more directly to consideration of the co-relationships of the ileac ulcer under notice; because its most evident accompanying lesions were either pneumonic or dysenteric. Generally it may be said that with *maximum* of ileac ulcers (6 examples) there was either no other lesion (2), or lung affections (3), or dysentery (1); whilst in the 4 examples of *minimum* ileac lesion, there was either no coarse complication (1) or else marked dysentery (3). It appears to me of fundamental import that in the two typical instances I have first described, there was no other marked coarse lesion anywhere seen in the trunk; and, moreover these simpler cases were both of the most acute character of any, being further of nearly equal duration, with probably similar life-symptoms, and certainly alike as regards the intestinal changes found: hence the idea of their being, as it were, typical of a certain definite morbid state, presented singly and alone in them, but liable to concur with other blood-contaminations with which their own cause has some connecting link, either within or outside the body. As the two cases stand, they present a close analogy with ordinary "typhoid," and it is at present impossible to say how frequent such cases are in Bombay or elsewhere; a new opening for research seems to be here offered, which may prove to be of much significance as regards the known rareness of genuine typhoid in the adult native population. (*V.* also Case 2*.) The only other case presenting no very manifest concomitant changes was No. 4, also a "fever" case; and since the iliac-lesions in it were comparatively inconspicuous, I regarded this instance as one transitive to that small group of "remittents" in which no coarse morbid lesion has been found after death—for evidently degrees of the intestinal lesion are to be admitted. When the lungs were distinctly

implicated—see cases 3, 5 and 7—the ileac ulcers were prominent and characteristic; and there co-existed signs of blood deterioration, and of wide disturbance of the circulation, such as might be anticipated. When the large intestine was involved in marked degree—as in cases 6, 8 and 9—the ileac ulcers were so few as to seem almost incidental, which may indicate either a different form of blood-poisoning, or a more restricted distribution of that prevailing: case No. 6 would show that the Peyerian lesion when very limited may be seated even high up the small gut, still being of characteristic aspect. Case 10 proves that atrophic or necrotic lesion may, however, extend widely over both large and small bowel; though it seems likely that the dysentery here, besides being of different character, was also more chronic than the Peyerian lesion.

The new Case 2* present points of special interest, both etiological and clinical, which forcibly suggest a real connection between some Remittents and Enteric. It merits, therefore, deliberate study.

DESCRIPTION OF THE CASES.

Case 1. *Summary.—Remittent fever from the 9th day, in a Brahman; pyrexia moderate, declining; pink spots of eruption very few; no diarrhœa, but constipation, deafness, anæmia and the "asthenic" state rather than the "typhoid"; on 16th day sudden acute peritonitis, and death on 18th day of illness. At autopsy the liver enlarged, signs of diffused peritonitis, numerous ulcers (Peyerian, yet not like typhoid,) at end of ileum, two of which probably perforated the bowel; large intestine unaffected; mesenteric glands moderately inflamed. No tubercle anywhere.*

A Hindoo vegetarian (Brahman), æt. 20, resident 1½ yrs. in Bombay, and of late a cook in a family living at Khetwady (Native town), where no one else is said to be ill: previously in good health. Nine days before admission had complained of feverishness, chills and aching pains, yet continued at his duties for 3 or 4 days, and getting worse had medical advice without amending: was then brought to the G. T. Hospital, 1st February 1886.

9th Day of Illness.—Is very pallid and prostrated, lips dry, tongue red, shrunk and dryish, a slight cough, no diarrhœa or abdominal uneasiness, t. 102·2°, p. 92, and circulation very feeble; skin dry; wanders a little in speech,

yet no stupor, the eyes bright and he turns his body; the knees are raised; is quite conscious and alert when roused. E. t. 102·4.°.

10th Day—T. 102°4, p. 88, r. 26. Slept after the bromide given, lies quiet, eyes red, still wanders, tongue not so dry, some headache; abdomen rather full, tenderish, no stool, no pink spots visible on trunk: the liver somewhat enlarged, not so the spleen; respiration sighing, and no dulness on percussion of chest. Diaphoretics with Digitalis and Ammonia ordered. E. t. 102·4, p. 92, r. 26,—no delirium, slight headache, is notably deaf; the head not hot, lies on his side. Urine scanty, high-coloured, clear, acid, sp. gr. 1020, no albumen or sugar, and no sediment on standing. No stool passed.

11th Day—T. 101·4°, p. 88, r. 26. Slept after the sedative; no delirium, some headache, he turns about in the bed. Some cough with bronchial congestion. Abdomen flatter, no alvine dejection, no pink spots, or gurgling or tenderness in the belly. The feet and hands continue perceptibly cooler than the trunk. Quinine 15 grs. giv n and 10 grs. ordered in addition. E. t. 101·6°, p. 84, r. 22. Skin dry, is quiet, turns about, is alert but very weak. No stool.

12th Day—T. 100, p. 88, r. 24. Less fever yet more prostration, tongue dryish and brownish, no delirium, the pupils largish; lies on the side. Had slept after the sedative. No alvine dejection or abdominal uneasiness, no pink spots. Quinine 10 grs. given and 10 grs. ordered. E.t. 101·6°, p. 92, r. 20, general condition unchanged; no evident local complication with this low asthenic fever. The urine of day 14 oz., pale, clear, acid, sp. gr. 1010, no albumen, no sediment on standing.

13th Day—T. 100·4°, p. 80, r. 24. Asthenia more apparent, pyrexia declines, no stupor, the head feels hot, the hands less so, the feet cool; sordes and a dry brown tongue; no stool or abdominal uneasiness. Quinine 10 grs. given and 10 grs. ordered in addition. E.t. 102·4°, p. 88, r. 22. Some rallying rather than oppression with this febrile exacerbation, the cause of which was not apparent; an increase however of pulmonary congestion; no stool. T. at 9 p.m. 102°.

14th Day—T. 100·6°, p. 80, r. 18. Slept without sedative, no delirium, though extremely weak he is not in the "typhoid state," being alert when spoken to, turning his body and raising the knees, pupils rather small, the tongue shrunken, pointed, dotted red, sordes present. His hair has quickly turned grey, or white over temples. Deafness persists. The spleen is now enlarged and tender; abdomen generally seems unaffected; one doubtful pink spot on it seen. There are no augmented respiratory signs; no stool. A simple enema of rice-water ordered; then Quinine 30 grs. with Ether, Digitalis and Nux Vomica, in divided doses. E. t. 102°, p. 86, r. 22, a free evacuation, thin, yellowish, with yellow specks in it, no foul smell, followed the enema. General state unchanged. Temp. at 9 p.m. 100°.

15*th Day*—T. 100°, p. 76, r. 22. Slept; skin dry as usual, no stool, no abdominal uneasiness; persistence of asthenia without any stupor or evident local disease. Quinine 10 grs. given and 10 grs. ordered. E.t. 102°, p. 92, r. 20, one scanty stool (not seen by me); he seems less oppressed with this exacerbation, but its recurrence induced me to direct sponging of the body and the subcutaneous injection of Quinine (grs. 5. of the neutral salt): temp. before sponging 101·2°, after 100°, at midnight 99·2°.

16*th Day*—T. 99°, p. 76, r. 20, is weaker, the features more pinched and tongue drier; during night was moaning; no stool, the abdomen supple, not tender; he lies on the side: no delirium. About noon he rose to pass a stool, and was suddenly seized with acute pain in the belly and faintness. E. t. 100·2, p. 100, r. 26, the signs of acute peritonitis were now present, abdomen somewhat distended and extremely tender, especially at hypogastrium rather than on right side; no collapse. The stool passed was rather large, yellowish with soft fœcoid matter, inodorous, and with no blood, pus or slime visibly intermixed. There was occasional hiccup, and the knees were not drawn up. Opium ordered with small doses of Calomel and Belladonna, and soothing application.

17*th Day*—T. 98·2°, p. 100, r. 36. Peritonitis-signs more developed, yet he lies upon his side and knees not bent: abdomen rather retracted: no stool. E. t. 100, p. 104, r. 36, tympanites and increasing prostration. Treatment continued.

18*th Day*—T. 99·2°, p. 96, r. 48, no alvine evacuation; has rallied a little, limbs straight, understands and answers questions. One fresh pink spot under left clavicle. The urine passed was reddish-coloured, a little clouded acid, sp. gr. 1022, and contained a trace of albumen. After vomiting once, the patient died exhausted about 3 P.M. The chart appended resembles that of many Bombay "remittents" towards their close, in showing pyrexia of continued character finally tending to remit or intermit; here, however, life prematurely arrested by the supervention of a fatal traumatic peritonitis.

Autopsy at 7-0 P.M.—Body stiff, fairly nourished: the blood sets.

Head—not examined.

Chest.—Lungs inflated in front, congested posteriorly, with small collapsed (?) apoplectic lobules. Bronchiæ reddened. Weights—Right 14 ozs. Left 12 ozs.

Heart—Substance firm, valves healthy, right cavities (auricle most) occupied with firm clot, pale on front aspect. Wt. 8 ozs.

Abdomen.—The sign of diffused acute peritonitis, extravasation of fœcal matters not indicated, very little fluid in peritoneal sac. Liver large, firm, dry, uniform tint throughout. Bile dark, viscid. Wt. 3 lbs. 8 ozs. Spleen largish, firm; pulp dark, dry; capsule thin. Wt. 8 ozs. Kidneys congested, firm, surface smooth; capsule thin, not adherent. Wts 4 ozs. each. Stomach half-filled with green glairy liquid: mucous membrane pallid, mammillated.

Small intestines above inflated. Duodenum—contents as in stomach, mucous membrane not softened, pinkish. Jejunum—Serous coat inflamed, mucous membrane rather pink uniformly, contents greenish-yellow glairy liquid, moderate in amount. Ileum—Above inflated, serous coat generally much inflamed; the lower folds empty, compressed, matted and deeply sunk in cavity of pelvis. Where outside the marks of most intense inflammation and lymph-exudation, there within not usually any ulcer or perforating spot: the peritoneal redness being limited to the serosa, even when so dark as to resemble a threatening gangrene of gut-walls. Muscular coat of ileum not apparently altered, in general. Mucous membrane of pinkish hue throughout, deeper-congestive patches not noted. Contents of gut below, a moderate quantity of matter, yellow, grumous, semi-liquid, not foul-smelling or ammoniacal.

Morbid intestinal lesions—Beginning at some 14 feet above ileo-cæcal valve were noticed small transverse deep red streaks upon and between valvulæ conniventes, $\frac{1}{4}$—$\frac{1}{2}$ inch long, and due to minute extravasations of blood beneath the mucosa; covered with mucus barely tinged red (containing ova of entozoon, found also elsewhere), but not presenting a distinct erosion or loss of substance at the free mucous surface. Also noticed some minuter pale atrophic (?) spots, saucer-like, upon the mucous membrane. Then 3 feet below, small distinct ulcers appeared, scattered, rounded, angular or slit-like (transverse) and rather deep, not always connected with P. patches, or the solitary glands so far as ascertainable: about a dozen seen. Nearer to the *i.-c.* valve larger ulcers apparent; 6 noted: one, two feet above the valve, showed after removal of the gut and breaking down of adhesions, a perforating aperture slit-like $\frac{1}{4}$ in. long; and so also another ulcer lower down, situated on a Peyerian patch: close to the valve was a broad continuous ulcer-area, ceasing abruptly at free edge of valve. Several Peyer's patches were found quite unchanged in both jejunum and ileum, at intervals between the above ulcers; indeed, all of them seemed so (if not rather atrophied) excepting those alone which offered on a part of their area an ulcer excavation: there was nowhere seen any reddening infiltration or prominent elevation of the agminated lymph-follicles themselves, nor of the unaffected solitary gland-follicles. Further details are given in the Table below, and illustrations in Plate 1, Fig 1; Plate 1a, Figs. A and B; and Plates 3 and 4. (See also the Chart).

Large intestine—Cæcum-contents liquid yellow fæces; mucous membrane reddened only, no ulcer: thread-worms here. Colon-contents scanty, yellow consistent fæces; mucous membrane normal. So the upper part of Rectum.

After preservation in spirits of wine, the lesions though becoming paler and losing their original deep redness of margin, better showed their connection with the P. patches, traces of which could commonly be detected at some part of their circumference practically unchanged, or somewhat turgid only. This remark applies to all the following cases.

Clinical comment.—An example of the Bombay "remittent

fever," sometimes also termed "typho-remittent"; without diarrhœa or marked abdominal signs, and unchecked by Quinine. Terminating, however, differently to most of such cases, and in a manner altogether similar to some examples of genuine "Typhoid." Yet the lesions not identical with those of ordinary "Enteric fever," as regards their anatomical characters; nor as regards successive stages of formation; nor probably in the date of their occurrence, for it seemed to me likely that the intestinal lesion here was a complication supervening within the last 3 or 4 days, along with the pink spots (cutaneous emboli) pulmonic congestion, splenic turgescence and tenderness. And the final renewed pyrexia of paroxysmal type was not hectic, as both chills and sweats were unnoted. The pronounced anæmia, rapid fading of hair-pigment, and cardiac weakness, are other noteworthy indications of primary blood deterioration. The genuine "typhoid state" was not developed here, nor is it generally so common as in 'enteric.' The rallying towards close of life, simultaneous with brief rises of temperature, is a familiar feature to me. Treatment seemed not to influence the course of illness, at the stage seen. Many of these remarks apply to succeeding cases.

Case 2.—(Arranged from Surgeon Damania's Notes.) *Summary: High and sustained fever from the 3rd day, in a young male adult; after decided remissions a sudden exacerbation on 13th day, and death on the 15th, preceded by bilious vomiting. Neither eruption nor diarrhœa. At autopsy the liver and spleen much enlarged; some local peritonitis, and several ulcers (Peyerian) at lower part of ileum, one of which had perforated the bowel: Mesenteric glands generally but little affected: the large intestine unchanged. No tubercle anywhere.*

Patient a Hindoo (Maratha), æt. 22, neither very anæmic nor scorbutic, but in good condition, a partaker of mixed diet, and a cultivator of the soil, resident of a village in the Deccan plain, long distant eastwards of Satara; entered that District Jail on 26th June, and was put to hard labour, feeding and lodging with other prisoners, who had been well, and who remained well. 21 days after his entry he became affected with chills, fever, headache and weakness, but still continued at work until 3 days later, when he was

taken into hospital, his temperature the same evening rising to 104° F. For 2 days more pyrexia remitted at morning, and thence for 5 days was nearly persistent at 103°—104°; when it began to remit again, and on the 13th morning of illness had declined to 100·2°. A sudden exacerbation now occurred towards evening (t 104·4°), which was sustained until the patient's death, about 36 hours later, on morning of estimated 15th day. (*Vide* Chart). During this period of illness his general condition seemed asthenic rather than adynamic, there being no development of stupor or the "typhoid state," even at the close: the tongue was furred, yet large, moist and rather flabby; the pulse was quickened yet not particularly small; chills preceded the febrile exacerbations, but sweating afterwards was not noted: there was headache, but no deafness or delirium. On the 6th day he complained of pain over the spleen, which was found to be enlarged; and also the liver; the appetite was fair, the bowels generally costive and the motions consistent: jaundice and vomiting were absent, and there was no right iliac tenderness or gurgliug, and no eruption of pink spots on the skin: no cough or implication of the lungs: urine not examined. With the febrile remissions on the 11th to 13th mornings, Dr. Damania did not see any critical amendment; nor with the evening exacerbation on the 13th day, either tympanites or other sign or symptom of peritonitis; but next day the bowels were relaxed, about 8 watery yellowish stools being passed, and somewhat unexpectedly the patient died on morning of the 15th day of illness (temp. 104·2°), after vomiting a greenish liquid. Treatment consisted of diaphoretics, quinine, cold to the head, and latterly astringents with turpentine: the diet—rice conji and milk.

The first diagnosis was that of ordinary "Remittent" fever, there being no special features observed: this was subsequently changed to "Typhoid" fever on account of the sustained character of the pyrexia, and the enteric lesion found *post-mortem*.

The family and prior personal history of this patient could not be learnt; nor the sanitary or medical state of his village home: the man had not been previously exposed to bad weather or confined in unhealthy lock-ups; in the Jail he worked in a common gang of prisoners, drinking the same water, not going outside, and not being engaged on latrine-cleansing. Fever was not at the time common in the jail or in the town, or in the city hospital where typhoid had not been seen for 3 years, and only 4 cases of "Remittent" since January last; no similar case was recollected in or out of jail. It would therefore appear that the poison of the disease had in this case been brought into jail from outside, its incubation period being at the shortest not less than 21 days. (Dr. D.'s statement.)

Autopsy was made at noon of morning of decease. Brain not examined: marked morbid changes found only in the abdomen—the liver was considerably enlarged (wt. 4 lbs. 3½ ozs.), pale patches not seen; the gall-bladder

contained yellowish glairy bile not resembling the copious greenish liquid in the stomach and vomited up: the spleen also very large (wt. 1 lb. 14½ ozs.) and its capsule thick and opaque-white at upper end: kidneys seemed normal, wts. 4½ and 5 ozs. The stomach was filled with greenish fluid, but appeared otherwise normal; the duodenum presented nothing peculiar: there were hyperæmic patches in the mucous membrane lower down, but, petechiæ or extravasations of blood were not noticed. When fresh the ulcers in the ileum were reddened, their edges tumid and smooth: the patches of Peyer were neither prominent nor infarcted, and the mesenteric glands around did not seem to be much enlarged. Dr. Damania also states that on some of the ulcers a yellowish slough was loosely adherent, and that the shape of their fundus was not funnel-shaped: he considered that the intestinal lesions were somewhat different from those he had seen in cases of "typhoid" fever: and he kindly forwarded the specimen of intestine to me without delay.

Description of lower end of Ileum, including a length of 4½ feet, with addition of Cæcum and its appendix, and also of the ascending Colon—beginning from above and proceeding downwards. The parts were almost decolorised by action of the spirit, but otherwise in good condition. The calibre of the gut and its walls, in general, seemingly normal; fat was plentiful: the fæcal contents had been removed. On account of an opaque lymph-effusion upon some parts of the serosa, information derived from translucency of the intestinal coats was not always available.

Near the upper end of the piece of gut a large Peyer's patch of normal aspect, with an atrophied space below it; 16 inches onwards another P. patch. the intervening mucous area showing no morbid changes, except some indistinct sub-mucous hyperæmic spots. At 6 inches down a P. patch of apparently moderate size, presenting 2 ulcers nearly median, parallel and respectively ⅛ and $\frac{3}{10}$ in. long, alike narrow, transverse, deep, situated upon the patch and extending beyond its edge, with somewhat tumid infolded margins, well defined; the cavity dipping down, the base formed seemingly of connective tissue: margin of the smaller ulcer about middle of patch still of reddish hue; remainder of follicular surface of the patch barely changed in elevation, consistence or general aspect, and the whole place now so inconspicuous as possibly to be overlooked. At 8 inches further a small median P. patch, like the intervening and surrounding mucous surface, hardly altered. Then about 2 feet above the ileo-cæcal valve, 2 narrow parallel transverse ulcers measuring $\frac{7}{10}$ in. by $\frac{3}{10}$ in. and $\frac{6}{10}$ in. by $\frac{2}{10}$ in., about ⅛ in. apart, with the intervening space occupied by a follicular area belonging to the P. patch here implicated; all being rather indistinct until the accumulated mucus and *débris* were gently brushed away, when the loss of substance became very evident: the ulcer-margins tumid, reddish (?), soft; base formed of connective or probably muscular fibre in part, of soughy aspect, with point

of deeper penetration: no evident "deposit" or thickening, except some minute nodular projections at bottom and sides of the larger sore, neither yellow nor opaque, but resembling spots of indurated connective. The lower and smaller ulcer seemed to extend beyond the follicular area; and in the next mucous sulcus below it was a central, minute, depressed, soft and shaggy spot, indicating to all appearance a third incipient necrosal point, with no lymph-follicle remaining visible near—*vide* PLATE 1*a*, which shows accurately the size, site, parallel arrangement and length diminishing downwards of these lesions; as well as the succeeding ones immediately following. About one and a half inches lower, a similar rather larger ulcer, occupying the centre and margin of a Peyer's patch; narrow, transverse, measuring $\frac{6}{10}$ by $\frac{3}{20}$ in., its edges a little tumid, the base formed of tranverse muscular bundles: after brushing there was detected a minute soft depressed spot amid the lymph-follicles, which had the aspect of an incipient necrotic erosion originating here, and thereby differing in site more than in seeming character from the early lesion noticed just above. (*Vide* Fig. *a* 2.) Two inches lower down a Peyer's patch with two similar ulcers, the larger upper one of which about 1 in. long, narrow, transverse, defined, had near its centre perforated all the intestinal coats by an ovoid aperture $\frac{1}{10}$ in. across, with rounded wavy shelving margins, and now blocked with a plug of lymph. (Fig. *c*.) The rest of the floor of the ulcer was somewhat inclined, and nodulated. About half an inch below this was a similar but smaller lesion, transverse and narrow, and $\frac{1}{2}$ in. long; defined and with a deep level basis not apparently extending beyond the sub-mucosa. And between these two the distinct follicular area of a P. patch, to which the ulcers clearly pertained, without there being any special elevation of the area; only that the two valvulæ-conniventes running parallel over part of this surface, are rather turgid and separated by a narrow deep cleft at the bottom of which one might have expected to find an erosion (so like, at first glance, was the cleft to the adjacent true necrotic lines), though certainly none was present, or indeed any manifest disturbance of the mucosal superficies. On comparing the mucous membrane around these ulcers and at other places, both above and below them, I noted that hereabouts the valvulæ were rather more developed, but how far such variation exceeded what may normally obtain, was not apparent to me; nor did I perceive any primary causal connection, the idea arising that the valvular turgescence might be rather a consequence of hyperæmia attending formation of the ulcers. An inch lower down was another small transverse ulcer $\frac{4}{10}$ in. long, punched out, its base reaching to the circular musculosa; its site obscurely yet unquestionably Peyerian, there still remaining a few hardly-altered follicular depressions. To the mesenteric side of this, half an inch lower, an oblique ulcer with similar characters and base of connective; possibly also follicular. There were seen here small groups or patches of lymph-follicles of very various dimensions, and not ulcerated; so that not every one such was implicated. One inch lower down a transverse ulcer, median, $\frac{6}{10}$ by $\frac{3}{10}$ in. with edges hardly

raised, the base level, shreddy and muscular; and half an inch below, a less elongated ulcer $\frac{3}{10}$ by $\frac{4}{10}$ in. angular, with well-defined edges on three sides, but slough-like on the remaining margin; its floor of muscle: it was not clear that the first of this pair was Peyerian, but the last seemed to be so. Three inches below, with intervening mucous membrane not manifestly changed (? atrophic spaces), a shallow lateral nearly longitudinal ulcer spot, $\frac{1}{2}$ in. long, very narrow and seemingly superficial: at one side, some lymph-follicles, $2\frac{3}{4}$ in. lower down, and approaching the ileo-cæcal valve—the intermediate surface unaltered—a transverse shallow sloughy ulcer, $\frac{7}{10}$ by $\frac{3}{10}$ in., edges not so well-defined as usual; lymph-follicles near: half an inch below and 3 inches from the valve, four larger sloughy necrotic areas of irregular or nearly transverse diamond shape, occupying the large Peyer's patches normally existing here, and the lowest terminating exactly at the ileac lip of the valve: though rather more extensive, these reminded me much of the corresponding lesion in case No. 3 (*vide* PLATE 1c., fig. B.) The intervening non-ulcerated follicular areas were not elevated, but rather indistinct, atrophied or becoming necrosed. The circular musculosa was freely exposed at floor of ulcers, and several livid spots of sub-mucous blood extravasations were to be seen near the valve.

Some mesenteric and meso-cæcal lymphatic gland remaining attached to the bowel here, were greatly enlarged, soft and palish.

The cæcum was unaltered (? hyperæmic), and so its appendix within. The colon too was of normal aspect.

Upon inspecting the outer serous surfaces I found a broad thick layer of greenish yellow lymph, most accumulated about the locus perforatus, and smeared along the gut for several inches above and below that spot; also scanty, and isolated streaks of lymph at a distance, not connected with ulceration within. The close resemblace of the ulcus perforans in this Case and in Case No. 1 sufficiently proved their identical character.

Whilst in this specimen (as commonly but not invariably) the large Peyer's patch situate just above the ileo-cæcal valve was the most extensively necrosed, still the follicular areas in general were not widest and deepest implicated in proportion to their proximity to the valve. 17 distinct ulcers were counted on the first inspection, all being central and probably every one at follicular sites. Enlarged solitary lymph follicles nowhere seen. The frequent arrangement in parallel pairs—the lower one the smaller—was noteworthy. Their strictly transverse direction seemed related to that of corresponding valvulæ-conniventes, and both possibly according to course of the main blood-vessels. The floor of some ulcers presented minute rounded elevations or concavities, which suggested a connection with prior existing lymph-follicles; but no valid evidence of this was obvious. There were some shreds of sloughy tissue (? follicular) pendant from the lowest ulcers, but they were now dark grey, and not of the yellow bile-stained hue of Typhoid lesions.

Clinical comment.—A case nearly approaching, I doubt not, to the preceding No. 1, and with a fuller chart of temperature, which forms a valuable datum. Dr. Damania was most obliging in answering my many questions through the post: he had a previous practical acquaintance with genuine "Typhoid" in a Native subject, and he termed this new instance typhoid or "enteric" only because there was no other available official designation which seemed equally suitable. Query—have other Medical Officers done the same? And are some of the so-called "Enteric fever" cases in the army, of this new kind? Unfortunately one cannot say, because the published descriptions of cases are seldom sufficiently detailed to permit of independent opinion. It is now however obvious, that not every ulcer—even when perforating—at the lower end of the Ileum, is truly "typhoid." As in case No. 1, I conceive the lesion here to be an *epi-phenomenon*, arising later than the 10th day of illness. There being no striking local symptoms, either then or until the accident of perforation, how can we be sure that such ulcers are absent in surviving cases?

[The force of some of the preceding remarks has now been shown by the occurrence of the Case next to be described; details of which came to hand after my comment on Case 2 was already in print. I therefore, purposely interrupt the original series of data, by here interposing Case 2*; which, as it could not well be analysed with the rest in Part II., may appear somewhat isolated from them.]

Case 2.* (Abstract of details recorded by Surgeon A. Faulkner, 19th Bo. N. I., stationed at Deesa, where fatal "Enteric fever" was reported as being unusually prevalent amongst the British Troops.)

Summary: Persistent fever, at first regarded as being of the ordinary "remittent" type, and declining by end of 3rd week; but then suddenly becoming exacerbated, and ending fatally with adynamic symptoms about 43rd day of illness. Some diarrhœa and abdominal pain during first attack, and more pronounced during the relapse, when blood appeared in the stools and the

signs of peritonitis became marked. Early general prostration, and the "typhoid state" with the relapse. No skin-eruption seen, the stools not noted as "pea-soupy"; right iliac gurgling and tympanites only towards the close. Chart appended. Extensive ileac-lesion, with acute peritonitis; mesenteric glands enlarged. No disease elsewhere; no tubercle.

Patient M. Hindu, mixed feeder, æt. 20, a recruit of 6 months' service in the 12th N. I., previously in good health, and of sober, steady habits; quartered and rationed with other sepoys, who continue well. Admitted into hospital on October 1, 1886, complaining of fever and indisposition of 3 or 4 days' duration. Course of Pyrexia—Attaining an early maximum of 103°—104° on the 6th and 7th days, fever was distinctly remittent throughout, and gradually declined to 98·5 on the 21st day of illness: then abruptly began a more sustained relapse lasting another 3 weeks, with during the first 9 days a pyrexial range of 101°—103°, and finally becoming intermittent with decline towards normal, when death by asthenia occurred; chills and sweats not mentioned. General and local symptoms.—There were none peculiar on admission at reputed 5th day of illness, when m. t. normal, e. t. 103°6, tongue clean, bowels regular or rather costive; severe frontal headache, and some night-delirium on the 8th day, and evidently prostration early set in. Quinine 10 grs. every 2 hours ordered, and alcohol. Some diarrhœa on and after the 14th day, accompanied with abdominal uneasiness, no right-iliac gurgling, the stools loose and ochrey; no rose-coloured eruption; there was continued headache, sleeplessness, night-delirium, much thirst, drowsiness and progressive emaciation. About the 20th day, although the fever and diarrhœa had both declined, there was no corresponding general amendment; but rather increasing prostration; and some diffused abdominal tenderness was now first noted. For the next two days of comparative intermission, however, the patient seemed a little better; and his quinine with diaphoretics was continued. The 25th day of illness was the first of the relapse; then the man became at once much worse, being restless, sleepless, delirious, quite deaf, and suffering from much pain and tenderness over the right iliac region of the abdomen, yet no gurgling on pressure, no blood in the stools, and no pink spots on the skin; the tongue red and dry, much thirst, m. t. 102°8; thenceforth sordes also appeared, and the fully developed "typhoid state." The abdomen seemed to be drawn in. During the next 6 days no improvement occurred, the stools were 2-3 in number, and passed chiefly at night; and about 10th day of the relapse, they contained on three occasions a quantity of blood. Bed-sores on both buttocks had supervened, and 2 days later a slight puffiness of the abdomen, with distinct gurgling on palpation over the right iliac fossa. The patient was prostrate, drowsy, anæmic, deaf and delirious; tongue highly furred, yet not quite dry; the actual pyrexia moderate, remitting and declining. For the next 5 days a

progressive advance of weakness, the abdomen becoming rather tympanitic, and then exquisitely tender. At the last, the m. t. was not above normal. ochre-hued stools were passed, there was hiccough, the mental faculties were clear until death now ensued from exhaustion.

Regarding the Autopsy, the notes of Dr. Faulkner were precisely as follows :—

Post-mortem 3 hours after death—No *rigor mortis*.

Head—Not examined.

Thorax—Lungs healthy ; left one weighed 8 ozs, the right lung 9½ ozs. Heart and Valves—Normal but slightly hypertrophied, and weighed 5 ozs.

Abdomen—A considerable quantity of sero-fibrinous effusion of yellowish colour was found on opening the abdominal cavity. Great enlargement and induration of all the mesenteric glands ; localised patches of high congestion of a bright red colour, which in some cases were covered with flakes of recent lymph, were noticed over coils of Ileum and Jejunum, indicating localised peritoneal inflammation, no doubt caused by pressure of the enlarged masses of mesenteric glands. *Stomach* inflated, contained a small quantity of a yellow fluid ; mucous lining congested. *Liver*—Enlarged and congested, substance normal, weight 1 lb. 15 ozs. *Spleen*—Enlarged and highly congested, weight 8 ozs. *Small Intestines*—Whole course indicative of congestion. Along lower part of Jejunum and in the Ileum marked characteristic ulcerations, and in other cases congestion, of Peyer's patches, were found, in one of which a pin-hole perforation in the centre of an ulcer near to the ileo-cæcal valve was noticed. Ulcerations of the Ileo-cæcal valve and adjacent mucous lining was also noticed. *Large Intestine*—Contained no blood or ulcerated patches, but its whole course was highly congested. No entozoa along intestinal canal. (True copy.)

The stomach and intestines were at once put into spirit and kindly forwarded to the Curator of the Grant College Musuem, at Bombay, as a comparatively rare example amongst natives of enteric lesion with characteristic ulcers in the Ileum. The parts were in good condition on arrival, and they were then examined by some of my colleagues, amongst whom the Professor of Pathology has expressed an opinion mainly concordant with my own found below.

In reply to some questions of mine, Dr. Faulkner was good enough to write that the lesions he saw seemed to him " characteristic of enteric fever lesions," with one exception which struck him on making the autopsy, and that was the ulcerations seemed more general and less defined than those he had seen in cases of Europeans who had died of typhoid fever, and general capillary congestion and hyperænic patches were noticed more or less along the Jejunum and Ileum. " Peritonitis was " certainly not the actual disease, although, as I have noted in the notes " when I made the P. M., there were distinct patches of localised perito-

"nitis which corresponded to pressure on the coats of intestine of the "mesenteric glands, which in this case were enormously large and indura- "ted. There have been a number of cases amongst the European troops "lately at Deesa, and in all the pathological lesions have been marked, "but Dr. B. tells me that in most the mesenteric glands were not affected; "in my case all these glands were greatly enlarged in masses; further he "states that the solitary glands in the Colon for some distance were "enlarged, elevated above the surface and congested in most of his "cases."—(Dr. F.)

The following description of the morbid lesions in this example from Deesa, is transcribed from my memoranda of scrutiny of the parts made upon several successive occasions:—

The *Stomach* appears to be unaffected in all its coats.

The *Small Intestines* show in the *Duodenum*, only a yellow staining of the mucosa with no alteration of consistence; mucus is plentiful both here and elsewhere. *Jejunum*—No marked alteration beyond a corrugated aspect due to action of spirit; some mesenteric glands, above, a little enlarged; no softening or blood-staining now visible, nor any marked pigmentation of the mucous membrane throughout: Peyer's patches not detected here. *Ileum*—Above, no morbid changes detected within; possibly some atrophic spots, but examination by transmitted light is interfered with by scattered fibrine exudations on the serosa. Neither Peyer's patches or solitary glands are clearly visible, and therefore assuredly not enlarged above. Then at about 7 feet from the Ileo-cæcal valve, two small patches were first of all detected, close together or continuous, which seemed depressed rather than raised; and upon their pitted surface were noticed, at the upper end, several minute transverse excavations formed by distinct erosions of the mucous membrane, exposing the bluish connective tissue beneath it; these slit-like erosions have an oblique direction downwards, and a length of $\frac{1}{10}$ to $\frac{1}{8}$ in.; they seem to begin in a blending of two or more of the 'dots' or 'pits' corresponding to sites of the sub-jacent lymph follicles; there is no attendant enlargement of the follicles themselves, either at or around the eroded spots, and but a slight increase of opacity here by transmitted light; the villi are intact and folded as commonly seen around the follicular pits, and the apertures of the Lieburkuhn-crypts remain distinct as usual. Four inches lower down is a smaller Peyer's patch, rather sunken, with a shallow angular ulcer upon its surface; two inches lower, another small patch with a partially effaced aspect; and about three inches onward another presenting two small erosions, obliquely directed and running cross-wise. Five inches onwards, a narrow patch, $1\frac{1}{2}$ inches long and very slightly raised, upon which at its ends are two small punched-out shallow ulcers, the rest of surface being of quasi-normal aspect: these ulcers seem rather more formed, but otherwise

resemble the erosions found above. The next intervening mucous area for 14 inches, appears to be normal and without any glandular patch upon it, at one part is a darkening, as of localised hyperæmia; and then follows a rather larger P. patch (1⅓ in. long) which shows on its otherwise hardly-changed surface 3 distinct ulcers, and also one or more incipient erosions; the ulcers are placed laterally and terminally, the upper one being rounded and obliquely dipping down, and the two lower ones narrow and transversely directed, like cross slits; these last measure ½ in. and ⅓ in. long, are sharpfy defined, and show some pale nodules on their floor—see PLATE 1*d*., fig. A. Their resemblance to the lesions figured in PLATE 1 *a*. is quite noteworthy; and by transmitted light considerable opacity with a slight thickening of the inner coats of the bowel is apparent around these excavated spots; the rest of the glandular area being hardly more dense than usual, and the adjoining walls of the gut not at all thickened but rather as if thinned. Then, there follows at intervals of a few inches, an uninterrupted series of larger median, angular, pointed, shallow and cross-spreading 'necroses' of the mucous membrane; the upper always connected with Peyerian areas, the remains of which above may be readily seen, until lower down they appear to be mostly destroyed by the augmenting mucous erosions; and still lower, it becomes impossible to trace any local connection, beyond the median position, between the ulcer-areas and the sites of prior-existing Peyerian groups of follicles. Within 2-3 feet of the ileo-cæcal valve, the mucons membrane of the Ileum is beset with large (½ in. to 1½ in. across) and smaller (½ in. to $\frac{1}{10}$ in. or less) necrosed areas, bare and free from attached sloughs, of irregular stripe-shape, with usually angular ends, and when not blended narrow and transversely directed, somewhat resembling cross-slits, or lance-head groovings in the mucosa. There may be a score of the larger, and many more of the smaller kind, whose actual number is however difficult to ascertain from their half-hidden site between folds of the mucons membrane. See PLATE 1*d*., fig. C. Close to the Ileo-cæcal valve shallow ulcers cover nearly one-half the mucons surface, the lowermost ceasing abruptly at the free edge of the valve; and here there is some general turgescence, with a dark blood hue of the mucosa. At about 2 feet from end of ileum, an ulcer has perforated the bowel, and at three or four places lower down similar perforations seem to become wider, (possibly from manipulation), large gaps now resulting which are partly closed by copious dark-hued fibrine-exudations upon the serous membrane outside; hence the necrotic process must have been both extensive and deep, and as well acute in intensity. The free mucous membrane situated between these lesions appears hardly to be altered in aspect, it looks however thinned (as are all the coats of the bowel); and on close inspection, minute spots of darkish softened character may be seen disseminated, indicating possibly incipient fresh erosions. There are no enlarged solitary lymph-follicles

to be made out, with certainty; and I failed to find any distinct remnants of Peyer's patches at the lower end of the Ileum; how the ulcer lesions actually commence in this region is therefore obscure, only seemingly they are from the first localised 'necroses' of the mucosa—or spots of acute 'atrophy'—and by their extension and blending, the widely destroyed areas evidently result. In this preparation portions of the mesentery are left at intervals, and in such fragments the mesenteric lymphatic-glands remaining are often, especially near the end, considerably enlarged, pallid and soft; on section, however, not showing infiltration with solid material, and exteriorly not being indurated with fibrine-exudation; no signs of tubercle anywhere detected; mesenteric fat is plentiful.

The Cæcum, with its Appendix, appears to be unaltered; and nothing strictly abnormal can now be seen in the Colon, or the Rectum so far as preserved.

Remarks.—The *etiology* of this case remained obscure; drinking water had been certified as good; the season at Deesa must have been unhealthy, since fatal Enteric (so-called) has been simultaneously frequent amongst the British troops there. Dr. Faulkner thought it may also occur in the Native soldiery, under the name of 'Remittent' fever; but that possibly the indigenous population by long residence become less liable to suffer, and also suffer in less degree, than the new-comers: young subjects seem predisposed. As to *symptoms* the course of pyrexia, as recorded above and in the Chart, appears to me nearly identical with that observed in some other severe yet surviving cases of so-called 'Remittents' with Relapse, *e. g.*, *Charts* Nos. 34 and 36 of PLATE VII. in my work on "Spirillum' Fever"; see also its Appendix B., p. 438: and this datum is noteworthy, because the 'relapse' was here distinctly associated with a severe enteric lesion. I consider it doubtful if the first attack was so associated, for the diarrhœa and abdominal pains then noted had apparently subsided before the second onset; with this event, however, wider or renewed lesion came on, which probably progressed more slowly than in Cases 1 and 2 above. That the lesion is essentially of the same character as in these examples, I consider to be evidently clear; there being in all my specimens an absence of the morbid changes characterising two of the three first stages of genuine Enteric, and an absence

of limitation of necrosis to the areas of lymph-follicles, with consequently a quite distinct aspect of the ulcer-lesions; notwithstanding that their common site and downward-progressing intensity, and their penetrating tendency, demonstrate a near or 'generic' alliance, so to say, with ordinary typhoid. No other specific lesion of the Ileum that I know of, offers any such close approximation of anatomical characters; and yet manifest differences existing, the only reasonable inference seems to be that there exists a whole group or class of intestinal septic lesions, which needs to be better identified and considered apart. With all Dr. Faulkner's conclusions I cannot concur, but I feel indebted for the opportunity of comparing his new case with my own; since it has served to widen the range of (so-called) 'Remittents' complicated with destructive lesions in the Ileum, and also further to impress the necessity of minute and absolute accuracy in our pathological records, if the present obscure relation of Typhoid and Indian Remittents is to be made clear. Not a few medical officers would, I doubt not, also have regarded the above case as one of characteristic or genuine Enteric fever, even although the lesions displayed are not precisely those of ordinary Typhoid; and no one can deny there are reasonable grounds for holding that opinion. That the site of the ulcers in the Ileum, their subsequent spread, and occasional ending by perforation of the bowel, approximate this disease to Typhoid, is a self-evident proposition; nor can there be any surprise that the clinical symptoms resembled not distantly those of Enteric fever; for the originating infection of the system might well have been equally 'septic' or 'pythogenic' in character (septicœmia being the comprehensive term for both), and the after symptomatic symptoms would almost necessarily be alike. Only I find here, as in the similar uncomplicated Cases 1 and 2 above, that the ileac lesions present differed from those of European and of genuine Indian Enteric (known to occur in Native subjects, see PART II.) not merely in degree, which would be a minor point; but also in their mode of commencement, which is a matter of primary pathological import. Besides, it seems to me clear

that the Indian 'septic' lesion has comparatively a late initiation in the illness, and a diverse and comparatively rapid course—hence therefore not being usually attended with early persistent and peculiar diarrhœa, as Typhoid proper commonly is.

CASE 3—*Summary: Fever of* 10 *days'* (?) *duration and adynamic tendency, terminating with pneumonic symptoms: absence of skin eruption and ileac gurgling, and the bowels not relaxed; marked febrile movements unchecked by Quinine, and death by asphyxia combined with asthenia. At autopsy, the brain wet, heart contracted, hæmorrhagic spots and semi-gangrenous patches in both lungs; liver large and flabby; spleen enlarged and lightly infarcted; the kidneys congested: there were several petechiæ and ulcers towards the end of the Ileum* (*one or two penetrating and perforation imminent*); *large intestine not implicated. No tubercle.*

The patient was a Hindoo vegetarian, æt. 21, immigrant from N. India, resident a year in Byculla (a crowded suburb of Bombay), and by occupation a sweetmeat-seller. He lodged in a small dark room with another man, who is reported well, and was brought to the J. J. Hospital on the morning of 23rd June 1886: it being stated that he had been ill with "fever" for some time, probably more than 10 days as first said. Temperature 101·8° F., the spleen enlarged and tender, and the bowels not moved for 5 days; prostration and low delirium present: Castor-oil, Bromide, Digitalis and diaphoretics ordered, with milk diet. At night the pyrexia declined to 99·8°.

Second Day.—M. t. 100·4°, rising in the afternoon to 102·8°; resp. 32, shallow; pulse 120, soft, regular. His general condition was entered as somewhat emaciated, pallid, prostrated yet irritable, speech incoherent, no muscular twitching; the pupils contracted, conjunctivæ not injected nor head hot; the tongue moist, pale, on the lips aphthæ-like spots; skin dry, no vibices or pink spots seen; the abdomen not tympanitic or tender on pressure, and no ileac gurgling; a stool passed in bed-clothes was scanty, semi-liquid; the urine retained and dribbling. Examination of the chest revealed localised impaired resonance behind, on both sides, with augmented vocal resonance and fine moist souuds, no sputum ejected. Liver not tender, it projects somewhat below the costal arch; spleen tender on pressure and felt one inch beyond the hypochondrium: the upward limits of these organs it was difficult to define satisfactorily. Urine drawn was high-coloured, hazy, sp. gr. 1020, albumin $\frac{1}{8}$, chlorides $\frac{1}{3}$, bile acids and pigment barely

indicated, an early sediment of phosphates (triple), with some pale cells, no tubular casts seen. The patient takes food and medicine with reluctance.

Third Day.—M. t. 100·6°; had two doses of Bromide and Chloral, still delirious; one alvine evacuation in bed. Quinine, 15 grs. and 10 grs., and 12 grs. in solution, with Hydrobromic acid, Digitalis and Ether. E. t. 100·6°, p. 120, small, soft, regular; skin dry; the tongue moist.

Fourth Day.—M. t. 102·2°, pulse 120, rather more full: general state not improved; Quinine 10 grs. Evening t. 104 6°, resp. 36, p. 126, rather full and bounding, the chest symptoms have augmented: skin dry, chills not noted. Amm. Carb, and Digitalis, Turpentine stupes with the poultices ordered: tepid sponging of trunk and Quinine, grs. 15, afterwards. At 10 p. m. the temp. 102°: catheter to be used regularly.

Fifth Day.—M. t. 102, p. 140, resp. 32; patient delirious, irritable and restless, the pneumonic signs increasing; medicines continued. Quinine 15 grs. Rum 4 oz. E. t. 101·8, pupils contracted still, tongue becoming dry and shrunken: a fœtid odour of the breath is noted.

Sixth Day.—M. t. 100·4°, p. 136, r. 36, skin dry, pupils contracted; more prostration, less active delirium, patient not sunk in the bed but turns on his side, with the knees bent; pulmonic dulness, vocal resonance and râle-area somewhat increased. Treatment continued, with Quinine. E. t. 102·8°, r. 40, p. 140, skin dry, more prostration.

Seventh Day.—M. t. 100, r. 50, p. 160, skin dry, emaciation, prostration with irritability rather than stupor; the pupils contracted. Stimulants freely ordered, and Turpentine stupes to the chest. E. t. 100·8, r. 46, p. 160, thready: local signs unabated.

Eighth Day in *Hospital.*—During the night no rise of temperature noted; the patient gradually losing strength, and breath, and sinking at 6-30 a.m. Chart appended.

Autopsy—3 hours after death. *Rigor mortis* in lower limbs: body warm in the dependent parts, somewhat emaciated; pupils slightly dilated equally. Muscles dark and blood semi-fluid. Head—Brain wet and visceral arachnoid milky: convolutions rather shrunken, and *pia* loose: coarse lesion not seen. Thorax—Pleuritic adhesions on r. side below, 4 ozs. clotted bloody fluid in r. pleural sac. Lungs—Wts. R. 15¼ ozs; L. 12¾ ozs. Right lung—Sub-pleural ecchymoses, lobular condensations with minute cavities in lower lobe behind, near centre of middle lobe a larger soft-walled gangrenous cavity, containing dark sanies, lower part of inferior lobe ædematous, congested or hæmorrhagic, yet generally aerated. Left lung—Upper lobe at lower margin a recent dull patch of pleurisy, and beneath this a consolidated and gangrenous state of parenchyma, not altogether airless; several scattered necrotic excavations present, and in lower lobe numerous hæmorrhagic points with in front pea-like gangrenous cavities. Trachea and bronchi congested. Heart—Wt. 5½ ozs., contracted, valves healthy, substance firm, small clots in r. cavities: in pericardium 1½ ozs., of clear yellow serum.

Abdomen—Petechiæ on under surface of diaphragm. No peritonitis; about ¼ oz. turbid yellow fluid in pelvic space. Liver—Wt. 44 oz., deep yellow tint, flabby, uniform; some traces of old perihepatitis. Spleen—Wt. 13 oz., capsule thin, opaque in parts only; substance dark, firm, with faint yet distinct areas of lighter red colour, both on surface and within. Kidneys—Wt. 4 oz., and 4½ oz., congested, without visible coarse lesion: their capsules easily separable.

Intestinal Canal.—Stomach contents bile-tinged liquid, mucous membrane not injected. Duodenum—Contents yellow tinged, no lesion of mucosa noted. Jejunum and Ileum—Moderately inflated, coats of usual thickness; the *serosa* clear, except at about 6 in. from the ileo-cæcal valve at free edge of gut a bright red spot ⅓ in. square, with a minute central opening (grey slough) corresponding within to base of an ulcer, and very slightly smeared with lymph around; also 6 in. above this another less pronounced pink spot, and 3 in. further upwards a third red spot; both these also corresponding to deep ulcers within, yet without actual perforation of the gut-walls. The *muscular* coat not apparently altered. The *mucosa* above of ordinary pallor, lower down the seat of hyperæmic areas gradually darkening till the final 2—3 feet, where a deep inflammatory hue prevailed, ceasing abruptly at the i.-c. valve. Upon this deeper-reddened surface and in line with the larger ulcers to be presently named (being sometimes blended with them but often quite separate), are seen several longitudinal and more or less triangular-shaped greyish streaks of superficial necrosis (? diphtheritic), measuring ½ to 1½ in. long. The Peyerian patches unaltered at upper part of gut—except by villous pigment-dotting, which affected in less degree the villi throughout—were lower down, somewhat turgid, reddened and a little raised, especially near end of ileum, without however approaching the infiltrated fungoid aspect of geniune 'Enteric' lesion. The solitary glands unseen, except near the end, where several of them appeared to be considerably enlarged and reddened. In the Jejunum were numerous small (1/10 to ⅛ in.) scattered sub-mucous hæmorrhages only sometimes corresponding in site to Peyer's patches. Within about 3 feet of the i.-c. valve, the mucous membrane presents several (more than 1 dozen) deep and defined ulcers, measuring from ¼ in. to 1½ in. at longest diameter, usually yet not invariably in an evident manner seated upon the Peyerian areas; when small being of rounded form, and when large being elongated and directed more or less transversely to the long axis of the bowel. Those of lesser dimensions might be situated at or near the attached mesenteric border of the gut, but the larger always occupied a position nearly mediate at the free border. In contour the larger ulcers were crenate or angular with pointed or starred ends; their edges scarlet-red, tumid and overhanging; the base when visible level and exposing either connective or muscular tissue, or at points even the serosa: a scanty yellowish slough might be seen covering some of them, in part. The non-necrosed surface of the Peyerian patches involved, had

generally the aspect of mere turgescence or tumidity, either marginal or diffused, and without any effacement of the villi and small follicular pits normally apparent, with the aid of a lens; and this remark held good even close to the i.-c. vale, where most of all the Peyerian lesion might be thought to resemble that of Enteric fever. These morbid appearances were strikingly marked at the autopsy, whilst the tissue-vascularity lasted, they become more intensified as the end of the ileum was approached, and they wholly ceased at its lower valvular limit: neither cæcum nor *appendix c. vermiformis* being so abnormally changed. The mesenteric glands corresponding were somewhat enlarged, softened and reddish.

The Large Intestine was but little altered in aspect.

The intestinal contents were noted as consisting above of yellowish mucus, then of olive-green grumous liquid, becoming more consistent towards end of ileum, and of light green tint: in the large intestine their aspect being that of soft or semi-solid yellowish fæces streaked with mucus. Over the more inflamed ileum areas I found a somewhat increased quantity of glairy mucus usually bile tinted.

Vide PLATE 1c., figs. A and B, with their description; and also the Table of Lesions below.

Clinical comment.—A case presenting a conjunction with the intestinal ulcers of other prominent organic signs of acute septic infection, and therefore significant of a near or common origin of both sets of lesions. Judging from the hospital experience (unfortunately nothing definite was ascertainable of state before admission), I conceive the lung lesion and the enteric to have been nearly cotemporary in origin and also of a common necrotic character. Both being sequelar to a different or milder infection, and indicative of a complication whch rapidly proceeds to the destruction of life. There are hundreds of immigrants like this man to be found in Bombay, and many fall ill sooner or later of "Remittent fever": of these the majority recover, some die, and the bodies of a very few can be inspected: as ulcers of the ileum may be absent, it is evident they are but occasional attendants—even rare phenomena—but how rare cannot be surmised, because this sort of septic necrosis is acuter, less extensive (though at least equally disseminated), and later in date than happens in "Typhoid" proper; and hence it is not so clearly (if at all) manifested during life. The present patient was treated in my Clinical ward, and the pupils had distinctly made out a pulmonic lesion (lobar pneumonia, double); but we

had no conception before his death of this wide intestinal lesion: had life been prolonged a few hours, I doubt not the symptoms of acute peritonitis would have become superadded to the pneumonic. Now, who can say how often these ileac phenomena prevail? I cannot.

CASE 4—*Summary: Remittent fever after 14th day in a Native Christian; pyrexia moderate and promptly declining. Breathing rapid, no pink spots, diarrhœa with acid (bacterial) stools; asthenia increasing until death on 24th day. At autopsy the lungs congested behind, a pale infarct in liver, hyperæmic areas in ileum with limited ulceration of a few Peyerian patches, and smaller scattered ulcers, mesenteric glands moderately inflamed; in the cæcum a little congestion. No tubercle.*

A Goanese factory hand (flesh-eater), æt. 30, was brought direct to the G. T. Hospital in December 1885 from Mahim—a neighbouring hamlet malarious and dirty, suffering from "fever" acquired there 14 days previously. The fever probably now abating, but patient's weakness augmenting; and his breathing being now embarrassed, pneumonia from the exposure to cold was at first suspected as a complication. On admission he was thin and prostrated, t. 102°, p. 120, r. 46, tongue white but dryish, abdomen rather full and tender, some diarrhœa reported, no pink spots seen: both liver and spleen enlarged and tender: the chest generally resonant, respiration shallow, and breath-sound harsh. E. t. 103°, and some delirium.

16th Day of Illness—T. 102°, p. 120,° r. 56: three stools during night; though prostrate he is conscious. The pyrexia declined towards evening.

17th Day.—T. 101·4°, p. 108, r. 52: five stools liquid, yellowish, not foul, frothy, acid in reaction and containing minute yellow clumps (bacterial); abdomen rather tumid and tender; no rallying. E. t. still declining, but no improvement in streugth; five stools as before; the tongue is becoming dry and brown. He lies prostrate, without stupor; breath cool; respiration 60, yet no physical signs of pneumonia or cardiac obstruction, the sputum very scanty, and non-aerated. No pink spots, and r. iliac gurgling doubtful.

18th Day.—T. 99°, p. 120, r. 64; four stools of similar character, abdomen uneasy, had been delirious, sordes increasing with subsultus, but he is easily roused. E. t. 100°, two stools.

19th Day.—T. 99°, p. 116, r 50; four stools as before, abdomen becoming retracted. E.t. 101·2 (a rise), p. 108 (a decline), r 54: one stool, grows weaker.

20th Day.—T. 99°, p. 100, r. 40; two stools, abdomen retracted, not tender. E. t. 100·4°, two stools.

21st Day.—T. 98·2, p. 96, r. 86; no stool, asthenic state increasing. E. t. 99°, one stool: no delirium.

22nd Day.—T. 97°, p. 80, r. 44; extreme asthenia, not stupor; no stool, urine passed in bed. E.t. 99°, rallies a little.

23rd Day.—T. 98°, p. 100, r. 50; no amendment. E.t. 98°.

24th Day.—T. 97°, p. 96, r. 48; gradually sank this evening, the t. rising previously 101·4° (Chart appended.) Treatment—Quinine in full doses; liquid food and stimulants.

Autopsy.—Emaciation; the blood fluid, thin, dark. Chest—Lungs retracted in front and pale, behind gorged with blood hypostatically; weights, right lung, 1 lb. 10 ozs.; left lung, 1 lb. 8 ozs. Heart flabby, small, pale clots on left side; valves normal; weight 8 ozs.

Abdomen—Intestines contracted, serous surfaces dry. Liver substance firm, uniform, anterior edge rounded, tint nearly normal, with a paler patch on upper surface 1 inch square and extending deeply within; wt. 3 lbs 1 oz. Pale yellow bile in gall-bladder. Spleen hardly changed any way; wt. 9 ozs. Kidneys—No change but some congestion; combined wt. 8 ozs. Stomach—Mucous membrane injected, contents alcoholic with curdled milk. Duodenum—Slightly congested, yellow mucous coating. Jejunum—The same with scanty milk clots. Ileum—Alike, but towards lower end some localised dark patches with hyperæmia and ulceration of 3-4 Peyer's patches in part, and solitary glands (?) a few; the corresponding mesenteric glands rather large, pink and soft. These changes not very prominent; the ileo-cæcal valve unaffected; for other details see the Table below and Plate 1, Fig. 2. Large intestine—Contents yellow masses becoming feculent towards its end; no inflammation or ulceration, or even congestion, except some red patches in the *caput cæci*.

I noted that the intestinal lesions appeared slight in comparison with the symptoms of exhaustion, and that they did not resemble Typhoid lesions. Also that the characters of the stools, as recorded, might be accounted for, partly, from the liberal administration of a milk diet.

Clinical comment.—Ordinary Remittent fever seen late, and marked by asthenia. The great rapidity of breathing remained unexplained. The intestinal lesion was, compared with other instances, insignificaut; and probably had no essential counection with the diarrhœa noted. The case occurred before this enquiry was instituted, and before the siguificance of the Peyerian ulcers was surmised: but it is worth recording for its pathological interest, and its connection here as showing a minor ileac lesion concomitaut with pronounced general symptoms. Therefore such lesion does not, as is asserted of Ty-

phoid, determine the course of a case: if this assertion be disputed (as it well may as regards Typhoid), then a certain similarity of nature appears between these two analogous aud (as I think) pythogenic or septic affections.

Case 5.—*Summary: Remittent (?) fever of about 3 weeks' duration; temperature at first high, pink spots or diarrhœa not seen, pain in right side, thirst, wandering, sudden fall of temperature, and death 4 days after admission. Autopsy—Brain unchanged; at apex of right lung a pale infarct, at base of left lung a large ecchymosis; towards end of ileum numerous large petechiæ, some connected with ulcers within, often at least Peyerian in site; mesenteric glands slightly enlarged: deep hyperæmia of cæcum, some congestion of colon, no ulcers here, but the meso-cæcal glands enlarged; pale infarcts in liver and spleen. Tubercle absent.*

A Hindoo vegetarian, æt. 40, from N. India, resident 4 years, serving as Ramosee or watchman in the Bhendi Bazaar—a very crowded locality of the Native town; robust and said to indulge in drink. After suffering from fever and diarrhœa of some 3 weeks' duration, was admitted in an enfeebled condition; t. 102°, p. 108, thirst excessive, the spleen somewhat enlarged, abdomen supple and free from uneasiness, no iliac gurgling felt or pink spots seen. Next day t. 103°, p. 116, much thirst, tongue pale and dryish, no headache, wanders a little, but is not in a state of stupor, and lies on the side. E t. 102·4°, p. 116, r. 40, still wandering, one stool passed, not kept; urine sp. gr. 1016, pale, clear, acid, no albumen. He now complains of severe pain in right side, liver not enlarged and no marked dulness of r. lung; it seemed to me that this day's phenomena might be 'acmal' in character. Third day—T. 100°, p. 108, r. 36; no sweats with this partial defervescence, has vomited; he has rallied somewhat, being less oppressed (had Potassium Bromide last night); tongne not so dry; he still complains of pain in the chest. E. t. 103°, r. 120, p. 48, no chills before this exacerbation, no cough; has pains in the joints and much thirst, tongue not dry; no headache; is quiet and conscious, muttering at times. Fourth day—Became excited and restless during the night; prompt defervescence early this morning, and unconsciousness: pupils equal, dilated, fixed; the last t. noted 97°, and falling. Treatment directed to symptoms. Quinine was given and sedatives; then stimulants: liquid food. Chart appended.

Autopsy 3 hours after death.—No vibices or jaundice: blood fluid, setting soon on exposure *Head*—Scalp not congested; *dura* moderately adherent, paleish; *arachnoid* smooth, clear; *pia* rather pale, moist in dependent parts;

brain substance pale, firm, convolutions rather shrunken, clear serum in ventricles ; no obvious disease. (Note that brain examined last, and after large vessels in chest drained of blood.) *Chest*—Heart : distended with fluid blood, specially right side ; substance pale, softish ; valves normal ; a few groups of minute petechiæ at base behind, beneath pericardium : much clear serum in p. sac : wt. of heart 10 ozs. Lungs : Pale, collapsed in front, and old adhesions on left side. Left lung dry, healthy-looking throughout, except some hypostatic congestion, and a few dark collapsed lobules dispersed, and at base a large diffused pleural and sub-pleural effusion of blood over an area of 2 sq. in., and ¼ in. thick, with a corresponding effusion upon the diaphragm and in its tendon. Wt. 12 ozs. Right lung : the lower and middle lobes healthy, only congested somewhat behind : the upper lobe is distended, firm, reddish, smeared with lymph and nodulated ; here is a central defined condensation of the air-cells, tough, pale red, wet, streaked white, with purulent foci and small inflamed areas around in the denser part, bits of which sank in water. Not much blood in this lobe, plugged vessels not seen with a lens. Wt. 16 ozs. The Bronchial glands unchanged, and bronchial tubes rather pallid on both sides. *Abdomen*—Peritoneum clear, bright, moist, a little reddish effusion clotting on exposure : no parietal petechiæ seen. Diaphragm pushed up ; omentum thin, pale. Intestines inflated, free, thin walled ; spotted with blood in coats of some central folds. The stomach pushed up ; its anterior surface presents a bright-red defined petechial effusion, running transversely, 3 in. by 2 in. wholly sub-serous and fading much after soaking 6 hours in carbolised water ; the mucous membranes pale and unchanged throughout. Duodenum—Normal in aspect, yellowish mucus plentiful. Jejunum—Also quasi-normal. Ileum—Also unchanged until the lower 5 feet, when numerous disseminated bright-red patches and streaks appeared, ¼ to 1½ in. across, either quite limited to the outer coats of the bowel, or locally connected with ulcers in the lining mucosa ; my impression being that the petechiæ preceded the ulceration in those last-named spots. These local hæmorrhages varied in site at circumference of the gut, aud also in depth of tint, some being early eflaced on soaking. The mucous membrane within was generally pallid or at most pinkish in parts, not injected ; covered with clear mucus, or thin yellow-stained mucus, or with scanty semi-solid yellow fecal streaks and clumps, which when covering an ulcer were uualtered in aspect. The ulcerations seen in the ileum are described in the Table below : they were numerous and commonly small, not at first sight necessarily or usually connected with lymph-follicles, and not largest or most numerous nearest the ileo-cæcal valve ; though not found at upper part of the intestines. The Peyerian patches and solitary glands not generally prominent, nor were the mesenteric glands in this region considerably altered. Even when the site of ulcers, the P. patches were not otherwise more changed than elsewhere, being at most a little turgid and of pinkish hue. Probably, however, all the larger ulcers at the free edge of the

gut were really seated on a P. patch; and their own size was about the same, whatever the dimensions of the follicular area may have been or was seen to be. (*Vide* PLATE 1, Fig. 3.)

Large Intestine—Mucosa deeply hyperæmic, yet free from ulcer or erosion at the cæcum; the mesenteric glands here enlarged and reddish, and some streaks of petechial effusion behind the gut, in the loose connective tissue: the Appendix cæci unchanged. Colon—Mucosa moderately vascular, showing no morbid changes; fæcal contents becoming consistent, scanty. Rectum—Quite normal, solid fæcal matter here.

Liver—Enlarged, wt. 3 lbs. 12 ozs., rather pallid, the larger blood-vessels filled; tissue on casual inspection unaltered, except a rounded pale spot 1½ in. in diam. on upper surface of r. lobe, infarct-like and extending 1 in. deep within. Dark brown, thickish bile in gall bladder.

Spleen—Wt. 7 ozs., consistence normal or softish; capsule thin, clear, surface indistinctly mottled with largeish light and dark areas: Malpighian bodies not distinct. Kidneys—Alike, joint wt. 10 ozs., pallid, capsule thin, moderately adherent; substance pale (right) or congested (left): no evident disease. Lumbar glands—Hardly enlarged, pinkish, soft.

Partial microscopic examination revealed some granular degeneration of the heart muscle-fibres; slight fatty degeneration of cells in the pale liver-spot; a normal state of the renal epithelium; no bacteria seen after addition of acetic acid, in these tissues, or in the pleural extravasation.

Clinical comment.—A case of "remittent" fever which terminated in a group of phenomena deserving of attention: for here is proof of the real nature and genesis of the intestinal lesion under discussion, and evidence of its association with a blood-deterioration sequelar to some other infection. No testimony could be clearer than the above, if it be allowed that the man had been suffering from "fever" for three weeks previously; and I took pains to learn all that was possible regarding this point, with the result of credence in his statement and his friends'. To my apprehension, the terminal phenomena witnessed belong to a culminating event, acute and brief. The sudden pain in right side 36 hours before death, may be associated with the state of the right lung found: some of the petechial effusions may have been earlier, others later in date: all the ileac ulcers appeared recent, and of nearly common date (thereby differing notably from 'typhoid' lesions). It is possible that pre-existing ulcers had determined the site of petechial extravasations, yet there was no sign of free hæmorrhage within

the bowel. I do not know how soon necrosis can ensue from blocking of a mucosal blood-vessel: possibly 20 hours might suffice. The paroxysmal pyrexia noted here (not I think due to medical treatment) is noteworthy: and it was from prior experience gained in my study of the 'spirillum' fever, that I inferred the acute final phenomena might be of *acme* character. After death I found plugs of micrococci in the stomach petechiæ, and also in a vessel beneath a small ileac ulcer. The spleen was curiously exempt from lesion, beyond as stated above; and since often, in fevers, the sites of vascular derangement appear accidental or inexplicable, so anatomical research might be stimulated. See next Case.

Case 6—*Summary: Remittent* (?) *fever of* 20 *days' duration in a vegetarian Pardesi* (*watchman*), *admitted just after cessation of fever in a state of collapse, with bilious vomiting but not purging: death* 36 *hours later. At autopsy a few sub-mucous ecchymoses and a distinct Peyerian ulcer in the jejunum, some ecchymosed Peyerian patches in the ileum; and general "dysenteric" sloughing and ulceration of the large intestine. Tubercle absent.*

Male Hindoo, æt. 35, large build, non-indigenous but resident 4 years, and of the same caste and occupation as No. 5, living in a crowded quarter (near Dhobi Talao) of the native town, was admitted during March 1886 in a state of prostration so extreme as to resemble the algide stage of Cholera. It was afterwards clearly and distinctly ascertained that he had for 20 days been suffering from fever, which commencing abruptly was at first high and continuous, then remitting and abating very shortly before his arrival at hospital, for the last week there had been great irritability of the stomach and apparently some purging; medicine had been given without avail, but the man refused to leave his room until he became exhausted. He had been addicted to the use of opium and of bhang (hemp), was never so ill before, nor were other persons in the same dwelling thus affected: no cholera prevalent now. On admission the temperature was sub-normal, pulse about 90 and very feeble: intelligence complete; he complains of a sense of heat in head and stomach and craves for strengthening food, but what is given him is promptly rejected by the stomach; there is no abdominal uneasiness, no griping or straining or purging; one or two stools in the 24 hours being passed, and these (probably mixed with urine) were in aspect pea-soupy, without foul smell or admixture of blood or slime: reaction acid, no bacterial clumps seen;

the unmixed vomit was a greenish liquid. In spite of active stimulant treatment (including the sub-cutaneous injection of ether), he remained in the above semi-collapsed state for 36 hours, finally becoming restless and breathless. In general the symptoms were not these of cholera or of uræmia, nor did they suggest to me any idea of the extensive "dysenteric" lesion present; the collapse here though probably intensified by neglect of prior treatment, seemed to be partly post-febrile and partly toxæmic,

Autopsy.—Emaciation: no vibices. Blood fluid and dark. Lungs—wts. 14 and 12 ozs, healthy, the right partly adherent (old). Heart quasi-normal: wt. 8 ozs. Abdomen—No petechiæ in peritoneum: liver pale, somewhat cirrhotic, wt. 3lbs; thin greenish bile in gall-bladder, similar to contents of duodenum, stomach and vomit. The spleen livid, softish, free from infarcts, wt. 7 ozs., capsule thin. Kidneys, 4 ozs. each, capsule rather adherent, cortex pallid, flabby, friable uniformly; medulla normal; the urinary bladder contracted. Stomach—Serosa clear, mucosa closely spotted with stellate and punctiform petechiæ, most numerous towards pylorus; no ulcer. Duodenum—Moderately vascular, no softening or erosion. Jejunum—Mucosa pinkish, hyperæmic in places, and 3 feet from pylorus onward, marked with several minute transverse dark streaks due to blood extravasation in sub-mucosa of valvulæ conniventes; at 3 feet lower down, an angular ulcer (⅝ in. broad) in the centre of an elongated Peyer's patch, seemingly normal in all other respects; edges of ulcer of vivid red tint, base level, greyish marbled; an opacity of the walls of the gut here, but serosa unchanged, or rather a little depressed, and veins around turgid and tortuous; the likeness to the ulcer in Case No. 5 very striking; no other seen near Ileum—Mucosa hyperæmic in places, Peyerian patches generally unchanged if not somewhat atrophied, till below some are dotted with red points, effaced on keeping; at the ileo-cæcal valve the P. patches more distinct, yet not diseased. Walls of bowel generally thin and dilated; mesenteric glands somewhat enlarged below. The Large Intestine was universally ulcerated and necrotic along the ridges, hardly any normal mucous membrane remaining, that left forming red and turgid areas between the grey sloughy streaks: the solitary glands not especially distinct; the musculosa (contracted) largely exposed in parts. The colon was more affected than either cæcum or rectum. Contents the same pea-soupy liquid as passed by stool; no hæmorrhages, and mucus-clumps scanty; the meso-colic glands rather large, soft, red.

Clinical comment—See that on Case No. 7.

Case 7—*Summary: Acute intestinal irritation (? fever) ending in collapse after a week's (?)illness; 3 days only in hospital. At autopsy slight pulmonary apoplexy, hyperæmic and inflamed areas towards the end of the small intestine, with several scattered*

Peyerian ulcers; moderate congestion along upper part of the large intestine. No tubercle.

Patient a Hindoo labourer, mixed feeder, resident at Mazagon, æt 35; had been ill 3 days with diarrhœa attributed to eating sweetmeats during a festival, which produceed indigestion and flatulent distension of the abdomen, with retching and diarrhœa; stools said to be frequent and passed with griping and straining. When admitted at 3 p. m. of 4th. September he was so much collapsed that his illness was at first attributed to 'cholera'—then very rare in the town: stimulants and astringents were ordered, and ice to suck. Soon afterwards two feculent stools were passed, vomiting occurred once, no cramps and the urine free. Next day, he was still much depressed, the skin cold, eyes sunken, retching persistent, the abdomen uneasy all over, and general restlessness noted. Stimnlants and warmth to the surface. At evening, no improvement; and worms being suspected, 40 grains of compound santonine powder were administered. 6th.—Has passed a few lumbrici, hiccup now present, collapse continues: at evening one stool. 7th.—Death at 4 A. M. The Native Assistant Surgeon in charge had altered the diagnosis to "acute catarrh," the result of irritating ingesta, or possibly of lumbrici: instances of such kind being it is said not uncommon here, although when autopsy is available morbid lesions like those described below have very seldom indeed been noticed—at least during the past two years. (Dr. M.'s statement.)

Post-mortem examination 5 hours after death.—Emaciation; pupils equal, normal; head not opened. The left lung presented at upper part of its lower lobe, two patches of pulmonary apoplexy: weights of lungs, 10 aud 11 ozs., weight of heart 8 ozs., clots partly decolorized in its right cavities; in the larynx some white patches with a vascular halo, trachea normal and so the aorta. The liver weighed 38 ozs., and seemed a little fatty; bile of dark green colour: the spleen weighed 8 ozs., and was dark and firm, its capsule smooth. Kidneys congested somewhat, weights 4 and 5 ozs. The peritoneum clear; small intestines contracted, their contents dark brown mucus above, becoming paler below, and pultaceous (like baby's motions) in the larger gut. Throughout the small intestine patches of deep mucous hyperæmia; just above the cæcal valve much congestion on Peyer's glands with ulcerations, margins of ulcers deeply blood-stained and slightly tumid; higher up, similar appearances were noted: some congestion of the large intestine, most at its upper part; in the cæcum thread worms. (Dr. M.'s note.)

I was present at this autopsy, and shortly afterwards made the following notes:—Morbid changes in ileum limited to about 3 feetat its end; coats here highly vascular without infiltration: passing downwards, there were seen—A Peyer's patch, large, distinct, not elevated but much thinned by atrophy about its centre, of pale grey hue: mucous membrane around

streaked a deep red. Another P. patch of moderate dimensions, pallid and a little tumid: mucosal area streaked red. A P. patch upon an intensely inflamed area around, itself less evidently hyperæmic; a fine bran-like aspect of the mucosa (croupous exudation on tips of the villi) hereabouts; by transmitted light the glandular patches are rather more translucent than the rest of the mucous membrane; three other P. patches following in a similar condition: another large, greyish, defined yet not diseased; mucosa now of pale pink hue. On the next P. patch, at its side and lower end, an ulcer ½ in. long, ovoid, edges tumid, highly inflamed towards the common mucous side, deep, funnel-shaped, obliquely directed, the narrow base covered by a yellowish slough reaching to the serosa which was unaffected: the remainder of the glandular area greyish and thinned, follicular pits rarefied; edges of the P. patch well defined by highly turgid blood-vessels of yellowish hue, with double lateral white streaks on a deep red fringe, and similar croupous streaks at edges of patch, and in less degree over its surface. (*Vide* PLATE 1c, Fig. A.) Next an unaffected P. patch, with hyperæmia of the general mucous area; then another patch with a small rounded ulcer at its lower end and side, upon a limited inflamed area, shelving, deep, sloughy at bottom: highly turgid vessels in connection with this: glandular area generally rather thinned. Then follows another clear pallid mucous space, presenting only a few transverse red streaks over about 8 inches of the gut. Then an intensely inflamed area, which, with a brief interruption, extends for an equal distance nearly as far as the ileo-cæcal valve: here being seen, first, a large P. patch of deep-red tint with a greyish coating; surrounded by a deep inflamed border, almost black in hue, yet still covered with a greyish, croupous coating; at its upper end 3 ulcers, one being minute: at the side is a small P. patch with an ulcer upon it: below, are two other small ulcers, and then a larger P. patch more deeply inflamed, and with several larger ulcers upon and around it. Close to the ileac valve the P. patches are not inflamed, and at edge of valve the mucous membrane is pallid. The total number of ulcers seen was about 12, and there were many indications of incipient atrophies and necrotic spots, besides. Dimensions varied from ¼ in. to 1 in. across, or more: the form was round, angular or branching: edges generally tumid and reddened, more especially towards the general mucous surface; the margin towards the patch being level and pale in comparison, and also less abrupt. Within the outer edge paler nodular projections were usually visible, indicating either persistent yet necrosed follicular portions, or infiltrated lines of sub mucous connective; narrow translucent lines separated such nodules and had often a radiating disposition; next followed a greyish adherent sloughy stratum (?) of connective tissue, and finally at the bottom of the ulcer little remained but a thin, semi-translucent and colourless layer, which upon section proved to be the muscular and serous coats—paler yet hardly thinner than normal. So far as appeared, these lesions were the result of combined sloughing and molecular disintegration of the mucosa and sub-

mucosa, occurring in the midst of an area of more or less intense blood-stasis. And they seemed to be of acute formation, and about the same age and maturity. Minor spots were apparently of incipient character, yet forming after a similar fashion. The funnel-shaped cavity and somewhat oblique direction of some ulcers, was sufficiently apparent; and though blocked vessels at sides and bottom were too small to be visible with a lens, it was evident that the loss of substance was dependant on, and propertionate to, the degree of vascular repletion of vessels in the sub-mucosa; such vessels could be easily traced in continuity with larger arteries and veins supplying the inner coats of the gut. A radiated puckering of the mucosa around some ulcers and thinned spots in the coat, was sometimes apparent. Almost every necrotic patch, and all the distincter ones, were connected with Peyerian areas. It occurred to me that the local inflammation had commenced some 3 feet above the ileo cæcal valve, and was proceding downwards. The mesenteric and meso-cæcal lymphatic glands were distinctly, yet not very prominently, implicated.

Clinical comment.—On admission this case, like No. 6, was in a state of collapse: and since such a state was imminent in No. 5, and had been reached in No. 8, then here appears a certain connecting link of this series. The subject and prior history of Nos. 5 and 6, were even remarkably alike. The history of No. 7 above was probably misleading—at least sweetmeats containing 'groundnuts' (*Arachis hypoynea*) are not known to be poisonous: and the subject of No. 8 below had evidently been exposed to toxæmic infection. At first sight, one might naturally hesitate to group closely together these four cases; yet if the ulcer-lesion under discussion have any diagnostic value, its utility could well be tested here. According to my apprehension the said lesion claims a special import, as clearly as does the "Typhoid" so-called. Hence the varying extent to which the cæcum or colon, or the liver and other organs were implicated in this and like groups of cases, becomes a really subordinate point indicating either difference of intensity or a concurrence of other influences. The striking evidence displayed in this series, of the overwhelming effect of some toxæmias seems to me very noteworthy; and there further seems to be an acmal or culminating time-event associated with such enteric lesions, which forcibly recalls to mind the phenomena often pertaining to the spirillar infection and some

others. I am not aware if this remark has been before made. The available clinical data are too brief and imperfect to warrant a discussion of individual symptoms: case No. 5 appears to afford the clue to genesis of the lesion in a characteristic form: and the earlier instances narrated are not contradictory thereto, since hyperæmias and blood-stases have always been noted in connection with the ulcers. As to their relationship with forms of dysentery, the absence of bacteriological data excludes any debate; and as yet, only clinical facts can be recorded.

Since the above comment was written, another remarkable instance has been witnessed of sudden and intense 'enteritis' with paralysis of the muscular parieties of the small intestine (the peritoneum being also somewhat inflamed), and such a degree of obstipation as to warrant the operation of enterotomy: the young man (a foreign immigrant) died 20 hours after admission, and I found disseminated patches of acute inflammation chiefly towards lower end of ileum, and usually implicating Peyer's patches, though not exclusively so, nor were the patches ulcerated: indeed, the only ulcer seen was a small one as high up as the duodenum, and this had the punched-out edges and irregular shape characterising some of the samples under notice. Acute blood-toxæmia, with enteritis and collapse, seemed the only likely diagnosis; of intensity and extent and possibly of kind, surpassing and diverse from the series just indicated. The large intestine was healthy-looking; there was no obstruction, and no suspicion of wilful poisoning.

Case 8—*Summary: Remittent (?) fever of* 10 *days' duration in a Native Christian; pyrexia suddenly declining, with supervention of deep jaundice and prostration without stupor, death on reputed* 17*th day of illness. At autopsy liver large and pale, cæcum and colon were much inflamed: a distinct ulcer on a Peyer's patch near the ileo-cæcal valve. No tubercle.*

A Goanese tailor, æt. 30, of intemperate habits, resident in Bombay for 25 years, and of late dwelling at a 'club' at Mody Bay—an unhealthy quarter in the Fort; reported to be ill for 10 days with 'fever' of paroxysmal

type. On admission (October 1884) he was prostrated, thirsty, complaining of severe pains in the joints and over the liver; no diarrhœa or pink spots: t. 102, p. 108. Next day a prompt defervescence with sweats and relief to the pains, but the hepatic enlargement and tenderness continued and deep jaundice supervened. With some brief evening exacerbations (t. 100°), the body heat declined from 98° to 97° in the course of the next six days; the pulse also falling from 96 to 80 or less, whilst the prostration became more intense—hiccup, rigor and a crop of petechiæ were noted on the fourth and fifth day, the hepatic uneasiness also persisting. A loud hæmic murmur became audible, and an asthenic state set in without stupor; pupils contracted; the stools scanty and putty like; no albuminaria. The patient was restless and moaning, yet conscious till his death, 7 days after admission, and on reputed 17th day of illness. (Chart appended.)

Autopsy.—The brain pallid, lungs inflated and pale, heart distended, the liver much enlarged and palish, wt. 4 lbs. 6 oz.; spleen rather small and firm (8 ozs.); kidneys pallid, with small blood-specks in their capsules. The small intestines inflated, thin walled; and towards end of ileum the Peyer's patches reddish with some congestion around, but no ulceration, except at one spot near the ileo-cæcal valve, at the edge of a patch otherwise hardly altered: this ulcer measured nearly 1 inch long, was rather deep, and had a grey sloughy base, with slightly puckered margin. The solitary lymph glands and the mesenteric, did not seem implicated. Cæcum deeply inflamed, its rugæ black with narrow grey sloughs along them; a nearly similar aspect in ascending colon, diminishing towards the rectum. Pale fæces (as first passed) in the ileum; grey and pink fæces (as last passed) in the colon. For other details see the Table below, and Plate 2, Fig. 5.

This datum is clinically useful as serving to illustrate the order of new events, after abrupt cessation of primary pyrexia; being such as in the corresponding instances of the spirillar infection, led me to infer the supervention of a secondary and quasi-septic toxæmia. Ulceration in the ileum was not seen in Relapsing Fever at Bombay, *vide* "Sp. Fev.," p. 282.

The above case has been before described in Trans. Med. and Phys. Soc. of Bombay, New Series, Part VII.

Clinical comment—See that affixed to Case No. 7 above.

Case 9.—*Summary: Sloughing ulcer of the foot and dysentery in an Arab immigrant, who died* 12 *days after admission. At autopsy, in the large intestine widespread sloughing and perforation of the cæcum; in the end of the ileum a few dysenteric ulcers unconnected with Peyer's patches, and also on one patch a small ulcerous excavation of a similar aspect to that in Case* 8.

Mussulman (Arab), mendicant, stranger, æt. 20, admitted with a sloughing ulcer on the left foot, of 2 months' duration: a cachectic subject also suffering from acute dysentery. During the 12 days he survived there were daily paroxysms of fever (100-2°); treatment was of no avail. The autopsy revealed recent peritonitis, with extensive necrosis of the mucosa of the large intestine and perforation at the cæcum of its walls: the sloughing process ceased at the ileo-cæcal valve, but dysenteric ulcers had encroached upon the lower 12 inches of the ileum, avoiding rather than implicating Peyerian areas. On a small patch 3 inches from the valve, I noted a spot $\frac{1}{3}$ by $\frac{1}{6}$ in., which looked like the ulcer in Case No. 8, and was seemingly quite distinct from the other dysenteric lesions. Around it the lymph-follicles of the patch were of normal aspect. Upon another Peyerian group above this, were a few narrow transverse lines of erosion resembling those of dysenteric ulcers, but the change was little marked. Solitary follicles not prominent in either small or large intestine. See PLATE II., Fig. 6.

Clinical comment.—An example here given as illustrating the concurrence and yet the differing character, of this ulcer-lesion and that belonging to dysentery when encroaching upon the ileum: there are now others described, illustrating the same important points.

CASE 10.—*Summary: Diarrhœa for 3 months in an opium-eater latterly exposed to malaria, terminating in exhaustion. Pyrexia not witnessed. At the autopsy a small chronic abscess under the diaphragm, extensive honeycombed ulceration of the large intestine, and numerous atrophic ulcers towards the lower end of Ileum connected with Peyer's patches, and characterised by their deep indigo-blue margins. No tubercle. Scorbutic diathesis not detected.*

Patient æt. 56, Hindoo (washerman), employed on the Matheran wooded hill sanitarium, where he stayed till after beginning of the late rains, and whence becoming ill he came down to Bombay and to hospital, being admitted 30th June. An asthenic and cachectic subject, addicted to opium-eating: complains of burning pain in the abdomen and looseness of bowels for the past six weeks: no abdominal tenderness present. Ipecac. and opium were ordered, and two days later the stools were seen to be yellow and feculent though frequently passed. Subsequently the frequency and aspect of the motions varied from day to day—a not uncommon entry being "stools feculent," sometimes there were no evacuations during the day. Pyrexia not noticed. Acetate of lead, pure opium or Dover's Powder were by turns administered with no permanent benefit; without the narcotic, abdominal

pain increased. After about 2 months stay in hospital and resumption of his opium boluses, a little castor-oil was given, which was followed by stools described as copious, watery, greenish, with feculence and traces of blood; then "motions large, feculent, without blood"; again watery diarrhœa unchecked by lead, continued loss of strength and final exhaustion 53 days after admission. The diet latterly had been wholly of milk.

Autopsy—Marked emaciation. The lungs congested hypostatically and œdematous. Weights 17 and 10 ozs. Heart, wt. 6 ozs; its aortic valves atheromatous and so the aorta to a wide extent. On under surface of diaphragm, on the right side and deeply indenting the liver, was a chronic abscess, the size of a small orange, thick-walled and containing curdy pus. Liver of healthy aspect: wt. 30 ozs. Spleen wt. 6½. ozs; its capsule opaque. Kidneys, wt. 3 ozs. each, and much congested: a cyst ½ in. in diameter on right side. Small Intestine—Little altered in aspect, except that its mucous surface presented within the lower 10 feet many hæmorrhagic spots of small size and chiefly limited to Peyer's patches. The large intestine showed large tracts of honey-combed ulceration, seated on a plum-coloured mucous area.—(*P.M.* Records of the J. J. Hospital.)

Description of the lesions in the Ileum—Coats of bowel much thinned, the serosa and musculosa generally otherwise unchanged: the mucosa within the last 8 feet or so showed about a dozen ulcer-like spots, each of which was surrounded by a deep blue edge, this tint encroaching upon the depressed area and also for $\frac{1}{20}$ in. upon the adjoining mucous surface. Smaller bluish stains, evidently submucous in site, were occasionally seen near and between these spots; and larger areas of deep red congestion also, along the valvulæ conniventes and at edges of several Peyer's patches. Such morbid appearances were not most marked at lowest end of the gut, or nearest the ileo-cæcal valve. The first trace of manifest lesion was found about 7 feet above the valve, at the upper end of a Peyer's patch, the follicles of which were nearly effaced by atrophy and slightly streaked red; 10 inches below was another depressed patch, showing 4 small ulcers bordered blue and with much hyperæmia around; 8 inches below, a blue-edged spot with no follicles seen near; then a small patch only thinned; then, a follicular blue-edged spot longitudinal in direction, a similar spot not evidently follicular, and 2 inches lower a blue spot at upper end of a P. patch similarly atrophied: 15 inches below another blue spot upon a patch, with one smaller? incipient at its side; 6 inches lower a patch having 4 small deep blue spots and paler spots outside: 6 inches down another Peyerian spot with spots near outside, then two patches simply atrophied, and 15 inches lower a deep blue Peyerian spot with others near; 6 inches below a patch merely atrophied, and again 4 inches lower; near to the end at the ileo-cœcal valve the P. patches were indistinct through wasting, some bluish stains were visible and a single small incipient? ulcer. The mucous hyperæmia was rather deepest here, but the Peyerian lesion decidedly less pronounced. The mesenteric

glands at the junction were somewhat enlarged and reddish, but not opaque. The cæcum was hyperæmic and showed many narrow, transverse, mucous ulcers having a deep blue edge; and so in the ascending colon. The cæcal appendage was 10 inches long and had a diverticulum; condition unchanged. The congested hue and also the deep indigo tint, quickly disappeared on soaking the specimen in carbolised water.

Minute examination.—The blue spots measure $\frac{1}{6}$ in. to 1 in., are rounded or angular, either transverse or longitudinal; they are connected solely with the sub-mucosa and its overlying mucous membrane, exposing however the musculosa at deepest middle part, without any opaque infiltration of it or of the serosa. At first sight they resemble veritable ulcers, but really are rather defined areas of atrophy and depression over which traces of the mucosa tend to persist, except at deepest point. The margin is turgid from vascular infiltration of the sub-mucosa; it shelves inwards layer by layer, as it were, but is abrupter and may overhang at the outer mucous-membrane side: a puckering around may be noticed. The floor also slopes inward a little, and is nodulated at the sides, the blue tint is deepest in the sub-mucosa, and does not pervade the deeper coats; although upon the serosa outside a slight darkening and depression may be noticed, indicating the site of lesion within. On section, there is no sign of enlarged lymph-follicles; the villi and Lieberkuhn tubes being, however, hypertrophied and expanded at the turgid margins of the spots; and upon the lower level part of the edges broad flat villous folds, often radiating, replace the normal villi and gradually subside towards the bottom of the spot. The apertures of the L. tubes also here become rarefied and stretched, before finally disappearing. The lymph-follicles of the patch seem simply to waste and shrink, there being commonly no elevation or opacity amid the tubular circles indicating their natural site. The nodular elevation beneath the edge and upon the depressed spot may possibly be follicular, but commonly they seem due to mere opacities in the sub-mucous connective tissue, and besides elsewhere the follicles do not show more opacity but rather less than normal. The deepest point of these quasi-ulcers is sometimes so translucent as to give the impression that perforation of the gut would have happened, had life continued longer; yet the outer muscular and serous coats of the bowel are not necessarily thinned, at the transculent part. For drawing of ulcers see PLATE 1 *c.*, Fig. B.

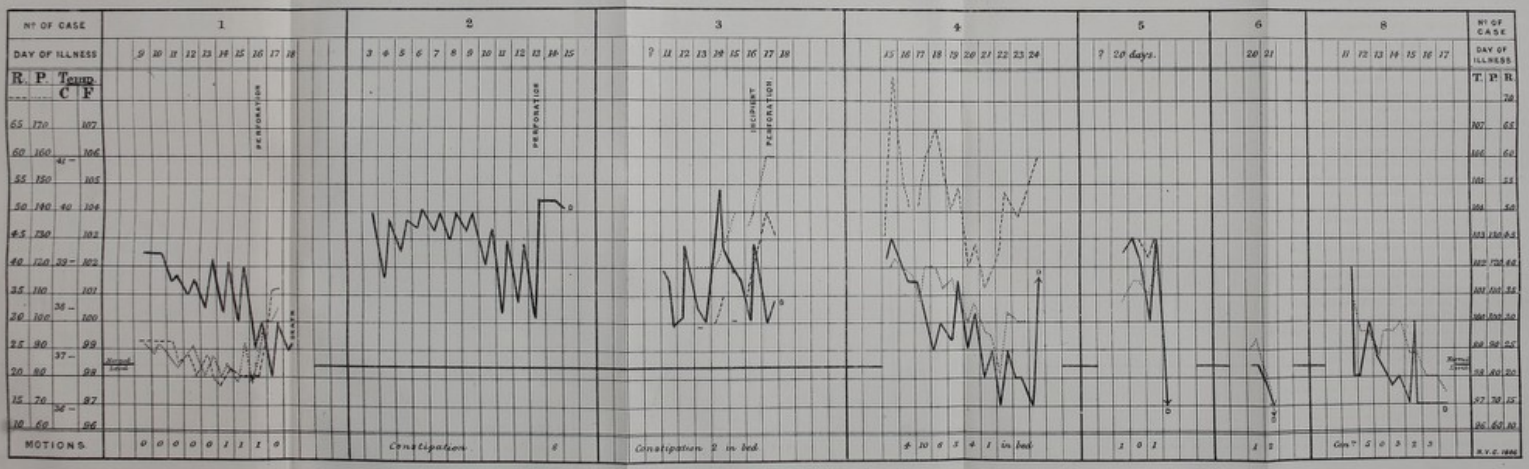
Clinical comment.—A case remarkable for displaying a more chronic form, and thereby perhaps a clearer demonstration of the mode of formation, of the ulcer-lesion under review. There is also the peculiar feature of a deep blue-tint (? due to Indican-pigment) of the submucous blood-extravasations, and of the atrophic ulcers resulting from such effusions. Also the con-

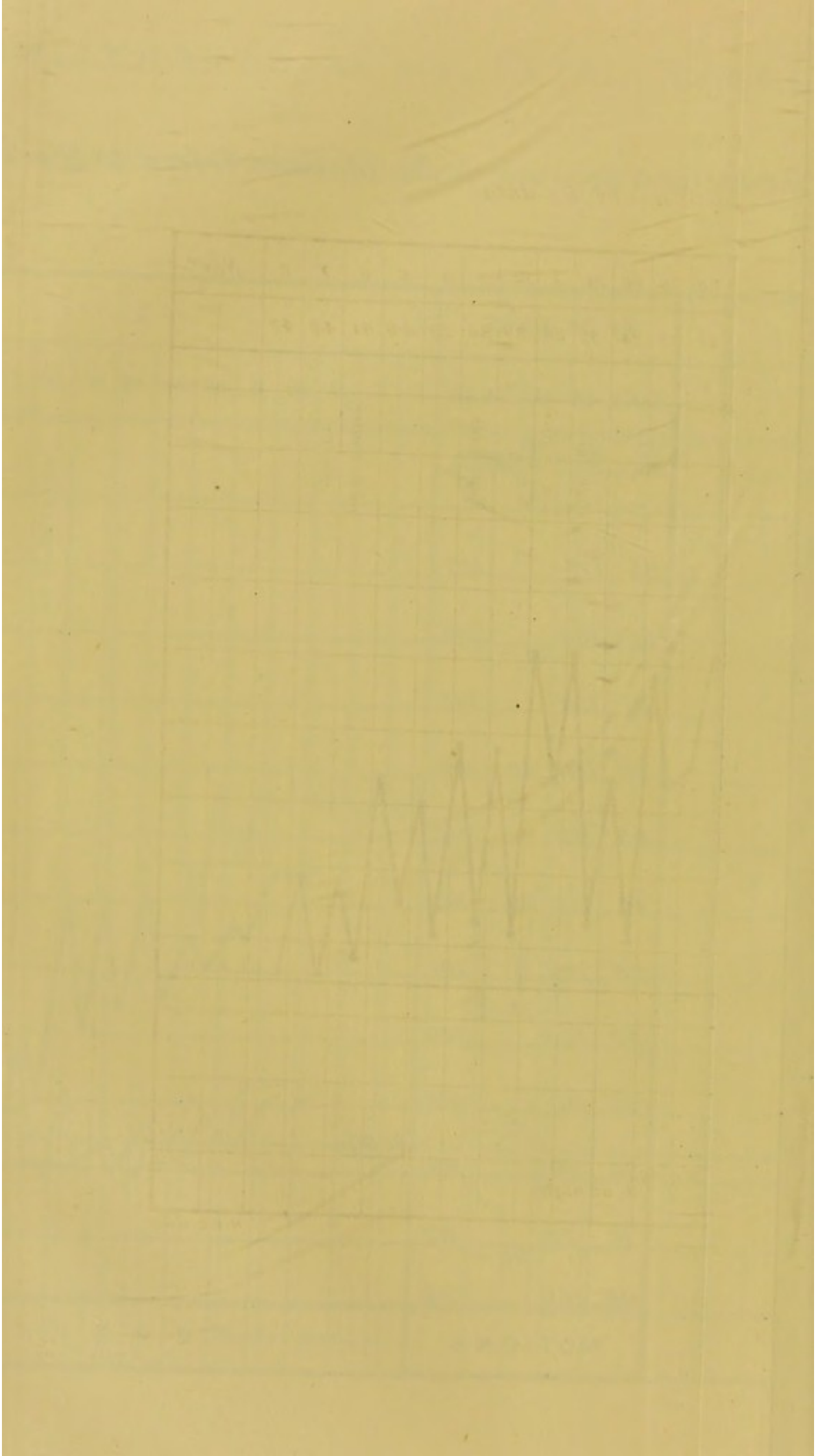
currence of a chronic abscess in the walls of the peritoneal cavity, raising the suspicion of pyæmic infection. And, lastly, the patient's habit of eating opium, which must in some way operate on the state of the blood. Evidence of a likely malarial infection was not very apparent. The case is therefore a complicated one, and the order and date of events can only be surmised. The main interest here concerns the ileac lesions, which I have termed chronic, whilst regarding them as essentially of the same necrotic—that is to say, molecularly atrophic—character as that pertaining to earlier and more acute cases narrated in this Essay. It is once more here distinctly shown that the Peyer's patches at the lower end of the ileum are especially liable to partial atrophy, in consequence of blood-deterioration; and also that this failure of nutrition attends a certain localised derangement of the blood-circulation.

Comment on the Charts.—The febrile cases have here been arranged, so far as practicable, in the order of their general completeness, as seen in hospital. **No. 2**, besides being rather the more acute, is however the least incomplete; and it is also particularly valuable for its indicating the early course of the fever, so seldom to be learnt under ordinary conditions. Although I had not the privilege of witnessing its progress, yet Dr. Damania has kindly furnished some serviceable details. Probably the pyrexia began with intermissions, soon (*i.e.*, on 4—5 day) becoming remittent, and then for 5 days assuming a continued type, after which its remitting character re-appears; this was not, however, quite sustained, nor was the febrile mitigation, Dr. Damania assures me, attended with a very decided amelioration in the general state of the patient. The chart shows an interruption in the decline of the fever about the 11th and 12 days, and immediately afterwards there doubtless occurred a perforation of the gut with sharp peritonitis ensuing, as indicated by the sudden rise of temperature on the 13th evening, which lasted about 36 hours longer, or until cessation of life. Even during this time, I understand, the outward signs of peritonitis were not very marked. As it stands, this record is altogether a significant one; and unwilling as I am to insist too much upon isolated cases, still I cannot but regard this datum as indicative of the simplest known conditions under which the septic ulcer-lesion may occur, with its possible consequences, so 'Typhoid' like: see also Comment attached to the Case itself. **No. 1** was the earliest coming under my own care: most probably it was of similar character to the above, though not seen until after a week's duration. The pyrexia was then about to decline, yet the patient, I thought, continued to grow weaker. Quinine did not prevent the sudden rise of temperature on 13th day; which, moreover, was accompanied by increase of the pulmonary congestion, by enlargement and tenderness of spleen, and by the appearance of a few pink spots on the trunk; and if such combination of signs imply renewed blood contamination, with possible obstructed capillary circulation, it may be

CLINICAL CHARTS OF THE FATAL CASES OF FEVER WITH PEYERIAN ULCERS: WITH A COMMENT FOLLOWING.

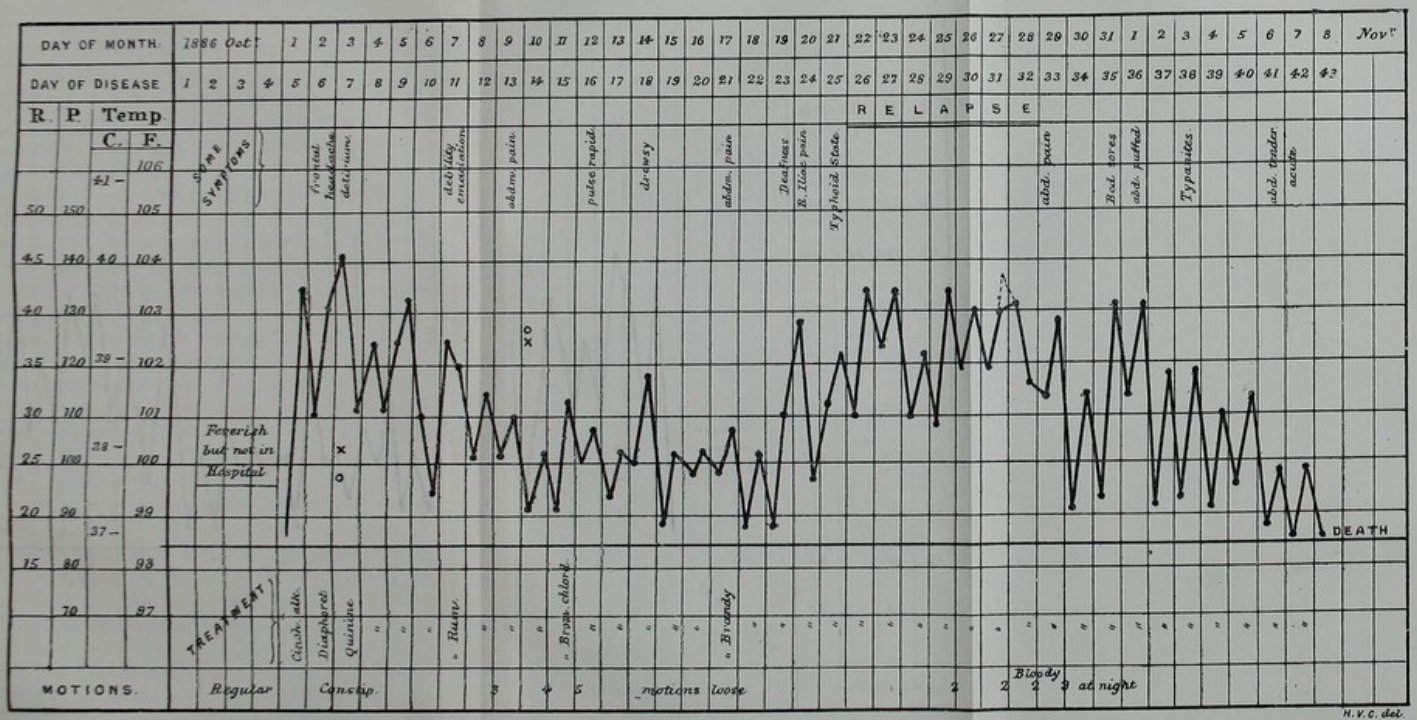
No. of Case refers to the Text. Axillary Temperature at morning and evening in continuous lines; the Pulse-rate per minute in dotted lines; Respirations per minute in interrupted lines.





CLINICAL CHART. REMITTENT FEVER (changed to ENTERIC). DEESA.

Temperatures Fahr. and Cent. in continuous lines: Pulse shown ×: Respiration °. Condensed from Dr F's data.



supposed that there then occurred scattered embolisms in some minute vessels at certain places in the Ileac mucous membrane, leading promptly to the formation of necrotic ulcer-lesion: and as the abdomen now became rather more retracted, and continued free from uneasiness and mucous flux, it may also be inferred that the local morbid process if irritative was yet still strictly localised. The three febrile paroxysms following were not, I was told, either preceded by chills or followed by sweats: it seemed to me that they acted as a sort of stimulus to the system, for the time: declining after the first one, no sign was given of the abdominal lesion (an enema administered on the 14th day producing only a single evacuation), until sudden perforation of the gut on the 16th day. Febrile reaction was slight, but the pulse and respiration quickened: this sufferer survived somewhat longer than Dr. D.'s patient. The Chart shows how little the pulse and the respiration were affected towards the close of illness, declining even when the febrile paroxysms had begun; it is worthy of study in this respect. Conjoined with the preceding, the present Case acquires additional emphasis as proof of a characteristic febrile complication, whose advent and course may be very obscure; and which alone may destroy life in a manner hitherto unsurmised—independently, that is, of the 'enteric' lesion proper. The instance was, indeed, entered in my private notes as probably one of the 'pure pyrexias' typical of Bombay 'remittents,' as usually seen; free from any striking complications during their two or three weeks' course, or even much longer, and unchecked by Quinine. As in No. 2, the existence of the abdominal lesion was not even suspected: yet both resemble 'Typhoid' in the gradual onset of illness, progressive course of pyrexia, resistance to ordinary treatment, and a certain mode of death in 2 to 3 weeks, and even as regards both regional and special site of morbid lesion: only during life the usual signs of such lesion were undetected, and eruptive spots were few or absent, and after death the lesion found was not quite the same as in ordinary 'enteric' fever.

Chart 3. Although the Ileac lesion was pronounced, yet the

chart is inevitably brief and too much influenced, no doubt, by concurring severe complications to permit of servicable comment. The seemingly paroxysmal course of the pyrexia was thought remarkable at the time: see also Remarks submitted with the Case itself.

Chart 4 displays a not unusual gradual subsidence of an attack of 'Remittent' fever. The enteric lesions were comparatively slight in degree, yet their occurrence at all might be significant of an alteration in the state of the blood shortly before death: the ulcers seemed, too, rather less recent or exuberant, and their formation may have coincided with the febrile exacerbations noted about the 19th day of illness. The much quickened respirations without a corresponding lung-lesion or cerebral disturbance, points, perhaps, also to blood-deterioration: the pulse was hardly quickened in proportion. Other comments are with the Case.

Chart 5. There is not material here requiring long notice; the tendency of pyrexia to remit and to final collapse, is however noteworthy in connection especially with the following Case **No. 6**. The patient here was admitted after collapse had supervened, and his chart is introduced mainly for completeness: the low and falling temperature indicates approach of death; and this instance may be regarded in connection not only with the preceding, but with the following Case **No. 7**, the three examples forming an instructive series of intestinal lesions differing in complexity, yet doubtless not without etiological affinities: see Remarks offered with Case **No. 7**. *Chart* 8 seems to belong to a similar crisis-fever series. Unfortunately, the character of the prior febrile illness was unknown: the phenomena witnessed seemed all post-critical, and must have occurred almost simultaneously, or within the period of at most 4 days before death—being in succession hepatic pain and deepening jaundice, with pale stools: 3rd day, rigors, hæmic bruit, skin-petechiæ; 2nd day, abdominal tenderness and several pink-coloured stools: some brief febrile paroxysms intervening. The Peyerian lesion itself was only cursorily noticed by me at the autopsy; though comparatively

insignificant, its associations render its presence well worth attention.

The highly-varied clinical conditions (within limits doubtless not undefinable) under which the ulcer-lesion in question has been noticed to occur, constitute in my opinion one of its chief features, and indicate its general character, as contrasted with a specified disease such as 'typhoid'; but this view concerns particulars, and a wider generalisation rather points to a connection of the whole series of 'Septic' with both 'Typhoid' and the 'Malarial' fevers. How far 'typhus' (*exanthematicus*) and 'relapsing fever' (*t. recurrens*) could be brought under the same head, will be differently estimated by physicians. Septicæmia is of a two-fold character; and only some forms of toxæmia, and only certain pathogenic organisms, reveal their operation in the body by a gross visible intestinal lesion: chemical and bacteriological research will probably soon distinguish such varieties, without however separating them from the rest of the common sepsis-series.

Chart *of Case* No 2.*—This supplementary instance, which has unavoidably been intercalated in the text, though differing in certain features from the rest, still, I doubt not, belongs to the same series. The Chart is unusually complete as regards bi-daily temperature observations; and it presents an example of 'Fever'—first of all termed 'remittent' and afterwards 'typhoid' or 'enteric'—which is marked by a distinct 'Relapse.' Such examples are comparatively rare, but have long been known to me as characterising some attacks of the Bombay 'remittents'; and, so far, approximating them to European 'typhoid' ("Spirillum Fever," p. 442). It was during this second event, or relapse, that the enteric lesion supervened, or, at least, so rapidly spread as to entail a fatal termination; and during its course, the temperature was rather more sustained than in the first exacerbation, having also about the same duration—see the Chart itself. As usual with the 'septic' fever, clinical indications of the local mischief—large as this proved to be—were by no means prominent, or even clear: this point offering a distinct contrast to ordinary pythogenic

'enteric.' I note that with the relapse a 'typhoid state' must have come on, wanting however, as is usual in my experience, the 'stupor' aspect commonly attributed to the veritable adynamic condition. Lastly, as recoveries are known to me after similar febrile relapses, it is evident once more that the severe enteric lesion is not a necessary feature of Indian septic fever; that is to say, not so invariable as the similar yet diverse lesion of European pythogenic fever.

I next proceed to offer some general Remarks on the Peyerian lesion itself, on the method of scrutiny adopted, and also on local conditions and changes accompanying the ulcers. The Tabular Statement below is intended to facilitate such general view of the lesions under discussion, and more especially a comparison with the better known 'Typhoid' lesion which seems to be its nearest analogue and congener. Minuter details and points of contrast, are reserved for PART II. of this Essay.

SUMMARY AND COMPARISON OF LESIONS IN THE ILEUM, BOTH EUROPEAN AND INDIAN.

Characters.	European Type.] Typhus, Enteric or Pythogenic fever.	Indian Series.] Case No. I. (Perforation of the Bowel.)	CASE No. 2.	CASE No. 4.	CASE No. 5.
1 Definition. Part, Site.	A specific inflammation of the follicular structures, both solitary and agminate, and seen immediately around them, of the lower part of the ileum and sometimes upper part of the cæcum; beginning near to the ileo-cæcal valve and extending upwards.	1 Fixed superficial red stains, then distinct ulcers, sometimes round as Peyer's patches, and some of these perforating walls of gut. These morbid appearances begin about 12 feet from end of ileum, the ulcers being found in the last 8-4 feet, increasing in number and size downwards to end ceasing at the ileo-cæcal valve.	1 A specific inflammation of the follicular structures and adjoining mucous, at the lower part of the ileum, and most pronounced at the ileo-cæcal valve or appendicle. There are small sub-mucous hæmorrhages in the jejunum, and one or two in the cæcum.	1 Dark mass of congestion with small sanguine pulmonic mucus on surface, and limited implication of some Peyer's patches, towards lower end of ileum; not increasing downwards, and at destroyed valve the mucous membrane unaffected. Cæcum also hyperæmic.	1 Along the lower 5 feet of Ileum numerous disincrustated patechial extravasations beneath the mucous, at different distances from the mucosum border, and varying from 1 in. to 24 in. in length. Commonly but not irregularly connected with an internal ulcer upon the mucous. Peyer's patches mostly unaffected in aspect; of 9 presented only 4 were ulcers upon them, and these not the lowest placed. Ileo-cæcal valve unaffected.
Ulcers — 1 Number 2 Arrangement.	Varies much, from one to some dozens; reaching upwards to the jejunum or downwards to the anus.	2 About 20 or more, distributed as intervals: scattered P. patches often intervening.	2 The larger and easily seen ones a dozen; the less conspicuous probably some scattered.	2 Insensibility and retraction of four P. patches and of some solitary glands. A portion preserved shows in its circular condition a patch 1½ in. long by ½ in. across, surface corrugated yet hardly elevated above the general level, and presenting three small ulcers of elliptical shape, transverse or oblique in direction, and located partly upon the follicular surface, and partly on the adjoining lead mucous membrane; they are each nine in aspect.	2 About 25 at intervals of two to six or more inches. Not increasing as another or one towards the lower end of the gut.
3 Size.	The ulcers are largest, most numerous and most advanced in course in the ileo-cæcal valve. They are in a continuous series, and without unaffected P. patches intervening.	3 In the jejunum some shallow irregular spots, also transverse deep and shallow ½ in. long; seated on or at foot of valvulæ conniventes, how likely cause (not one of extent), but as perceptible erosion of mucous: a few hæmorrhages. Towards end of ileum the ulcers appear. Solitary follicles not seen enlarged.	3 Variously undermined four P. patches and of some solitary glands. A portion preserved shows in its circular condition a patch 1½ in. long by ½ in. across, surface corrugated yet hardly elevated above the general level, and presenting three small ulcers of elliptical shape, transverse or oblique in direction, and located partly upon the follicular surface, and partly on the adjoining lead mucous membrane; they are each nine in aspect.	3
4 Large	Occupy the site of Peyer's patches at the free border of the gut, are comparatively elliptical in shape, or from bleeding swollen and their greatest diameter is commonly longitudinal.	4 Are ulcers at or near free border of gut, commonly yet not always evidently at site of Peyer's patches; are in form irregular or angular, and in greatest direction transverse or oblique.	4
5 Small	Patches in the solitary glands, are circular in shape, scanted over the surface, and found usually at the lower ordinary of the ileum.	5 Probably patches in the solitary follicles are ecarded and scattered, are most numerous below.	5
6 Dimensions	Measure ½ in. to 1½ inch or more over the ileo-cæcal valve, where the ulcers may spread or join.	6 Dimensions of ulcers range from ½ in. to 2 in. long diameter.	6 Are ulcers about 3-3/4 in. by 3-16th in.
7 Margin	A well-defined turgid fringe, free, a line or more wide, and overhanging the base.	7 Sometimes turgid, often pushed or scarcely, or as if ecarded out: free, bevelled, overhanging.	7 Margin well defined, even, not thickened, inflated or overhanging.
8 Base	Unusually smooth and clean, fragments of pultaceous mucus may remain adherent in middle or at sides, or hæmorrhagic spots may be present, and in severer cases a production of the granular or serous coats over a limited area. Generally ulcer set no deeper than the submucosa.	8 Level, of ruby slough or muscular fibre; even the weaker penetrating deeply: two cases to perforate by an open slit, which may however be partly militarily caused at the autopsy.	8 Level and exposing the connective or muscular tissue, or at a point the serous; occasionally fragments of this pulpy though grossly: as new deposit, sometimes softened, but blood conversation at times.
Varieties — 9 Large	May be little raised, soft, and follicles still perceptible, alternate beginning by small erosions, which extend. The lower portions, free and militarily recently, sometimes forming by a large slough of the entire surface.	9 There is less prominence and less militarily than in Typhoid. Only at the l.c. below are the ulcers mainly placed on follicle areas, and even here are independent and a considerable follicular surface remains of normal aspect.	9 The larger are due to bleeding and are easily Peyerian: when apparently not so from thickened visible follicles they still occupy a moderate site, and very in fact base but to entire removal of a small patch; their form, &c. being similar to that of distinct Peyerian ulcers. Site on P. patches either scarred or lateral, occupying formerly either their elevated margin or surface. Rarely more a whole large P. patch.	9 Besides these are seen of 1 in to 1 in apart, four smaller distinct ulcers, and the inflammation of these ulcers, attended at or not far from the mucosum attachment how: either reached or ecchymosis, ½ in. to 1½ in. long, penetrating deeply and sometimes in elongate direction through the mucosal membrane. The largest of these seems to be in connection with a small P. patch, a few follicles being perceptible at the ileocæcal end of this ulcer. Edges not elevated, rather scarred or pushed. Base formed of sloughy connective tissue.
10 Small	In very rare cases the solitary glands mostly or even solely are attacked.	10 Ulcers in connection not solitary glands not made out.	10 Many are massive and pushed rather thoroughly directed, upon the larger P. areas, or the smaller, others fewer are distinctly "button-like," either medium or larger, and apparently follicular also.	10 Mucous membrane and the mucus not apparently implicated in the larger ulcers, as ocean not found views. Surface of mucosa consciously around all the ulcers at the most a little turgid.
11 Surrounding tissues and Concretions.	Catarrhal inflammation of the mucous membrane not unduly extended. Except near the l.c. valve, ulcers rarely overpass more than very slightly the area of the indurated patches and follicles. Generalized secondary swellings, diphtheritic or gangrenous sometimes lymphatic inflammation in the sub-mucosa, are very uncommon.	11 Mucous membrane pedicels, a little turgid. Follicles adjoining not altered in aspect. Exudate on the l.c. valve, ulcers rarely overpass more than very slightly the area of the indurated patches and follicles. Generalized secondary swellings, diphtheritic or gangrenous sometimes lymphatic inflammation in the sub-mucosa, are very uncommon.	11 Besides hyperæmia and inflamed areas diffused, some 6 or 7 greenish grey level thin and wholly superficial excrusts of the mucosa, comparable to diphtheritic spots, yet not raised; lenticular in direction, never healed often as slough, in groups or easily joined to an ulcer, similar in site between P. patches: found in two of best disease. Abundance in jejunum, recent sub-mucous hæmorrhages (½—1 in. across, purple-head, aggregated mucous other, and as ulcers in mucosa contemporary, the two found below even at edge of ileo-cæcal valve, and by unmarshed light dark and excrescence with turgid result as the seats of the bowel.	11 Surrounding the above mucous membrane pedicels, pale. Its section the muscular coat is seen to be infiltrated and dark beneath the ulcers, and the serous also is darkened by pale-red extravasation.
12 Early stages	Intense congestion and uniform swelling, involving finally the whole surface of the patch; the colour at first brightened, mostly becomes pale. The solitary glands thus form rounded nodes. Microscopic stains that recruitment only in part of a pale lesions involved. Recasens Cycl. v. 1, p. 330.]	12 Probably acute stages not indicated; at least a gradual increase in thickness as shown here. Solid or even acute sources of the mucosa, without structure swelling, redness or visible infiltration or deposit: sub-mucoid lesions may however be present.	12
13 Progress	Partial disintegration and necrosis involving the whole of the central part of the patch, or one or more parts encircumscribed. The surface becomes jagged and the pultaceous bones readily part in gradually formed. the process begins in the patches around the centre, or is more advanced there.	13 Progressive stages, if any such really present, are indicated clearly by an extension of the necrotic process, either laterally or in depth.	13 By naked eye inspection, no signs of any the stages in formation, repair or retrogression of ulcers. No prior or subsidiary deposit; but a glassful deep cell infiltration (microscope), causing the vessel lesions and/or smaller spots, which might represent threatening or incipient necrosis of mucous envelopes. Very little thickening of muscularis, mucosa rather thickened by cell-infiltration; perhaps less of patches: repair, due to necrosis without much induration around. No evidence of combination. Age of ulcers to be estimated by their dimensions, and progress by amount of preceding opacity or thickening.
14 Repair	The inflamed and overhanging borders subside, and become adherent to the granulating base of the ulcer. The ulcer may be losing at one part and spreading at another. On one to smooth, shallow, pultaceous depression, free of glandular and follicles, they give in colour, and situated at a Peyer's site of similar tint.	14 No sign of combination; puckering of ulcer margins not attended with a healing down of the edge.	14
15 Retrogressive	The patches become less sloughy turgid, more even in contour and finally of a ship grey hue.	15 No sign of retrogressive changes.	15
16 Mesenteric glands.	Are correspondingly inflamed: at first red, swollen and soft, then of light-grey tint and firm. Abscesses may occur near the gland either between it and soft, or partial necrosis may take place within the substance of the gland.	16 Mesenteric glands are red and soft, or pale and dark, hardly being sometimes enlarged.	16 Comparatively little implicated: no evident deposit (fibrin or lobuloid) noted in them.	16 Mesenteric glands corresponding to the above towards end of ileum are large, pinkish and soft.
17 Del-e	Typhus may be fixed as early as or before the 7th day of disease, or not until after the 14th, beyond that. Perforation does sometimes occur frequent during the 3rd to the 5th week.	17 Total duration of these 17 days: terminated, perhaps all arrested, by supervention of acute peritonitis.	17 Clinical signs of enteric ulcers nil. Duration of ileum previous to admission not certainly known: stone bodied rectal: as surgery; possibly not older than the preceding 10 days; had passed normal a day or two, acute peritonitis from perforation in one or two places seemed inevitable and might have caused death.	17 Total duration of these ulcers dark, about 28 days (minimum). The ulcers were probably formed at a date some days of disease, or only a few days before death.
18 Significance	There is no necessary proportion between the intensity or extent of the intestinal lesion, and the severity of the general symptoms: moderate lesions being compatible with severe disease, and severe with moderate.	18 Intestinal lesion here of the greatest import. Fear to perforation of the gut as signs of its existence: tendency to constipation throughout: result not specially natural. Several moderate bends more subjacent than as applicable by known ulcers alone.	18 Intestinal lesion probably referable to mere exposure on the peritoneal, serous, pericardial, not of primary visceral import, but as manifest in excess of blood determination (?). Thereby differing from the "Enteric fever" lesion described, more than by anatomical characters alone (5). Perforation of the gut however is a common clinical feature.	18 Intestinal lesion an clearly unlimited during life, as prominent or characteristic diseases. General symptoms adynamic, and of all most prominent the embarrassment of breathing.
19 Diagnosis	Typhoid is chronic, specific, ulceration of the small intestines is extremely rare. Occasionally, after acute ulceration, a part of the intestine (e.g., caecum, sigmoid, transverse) may be found ulcerated, but the lesions are of a different character and the general symptoms are comparatively slight, there are no typhoid stools, the ulcers are few in number, and are commonly confined to such portions of the intestine as are most frequently affected with typhoid. [Extracted from Rosenstein's work.] Intestinal ulceration of the solitary glands: Cases of small primary sex, lesions the solitary glands with changes in the intestine: "not to be confused with typhoid." (Hughes in R. v. 20.)	19 Sore of large ulcers amenable distinctly the typhoid, but at the several value but for minor differences in symptoms. Perforation of mucosa absolute. Yet the action of the gut did not begin with follicular enlargement, was not in its progress necessarily associated with follicular enlargement, and their implication seemed to be partial rather than general; besides the intestinal ulcers usually differed in form and basis. The usually follicular ulcers as l.c. valve were rarely enlarged, even at very edge of main ulcer; here the mucous inflammation present must have been highly acclusive if a bolus, as in the fatalities, of which there is no additional evidence or thesis. The ulcer which appear to be non-Typerian may have been typical ulcer of solitary lymph follicles, or of small agminated groups of such follicles: their enlargement progress being consecutively destroyed of tissue of the lymph constituents, and a consecutive destruction between the base of the cancerous, if not of the muscularis, extension of tissue with fatal lesions.	19 There characters in the flesh alone did not reveal the true typhoid lesion. The part and site they occupy and how however nearly the same. And the general symptoms are the whole course: those of typhoid fever. The case was regarded as a key example of the Bombay "Remittent" fever, of a type sometimes termed the "Typho-remittent." But I thought the real cause of death was a threatened rupture of the bowel. Here is an example of the minor degree of Enteric disease, which may accompany remittent fever of such fevers: and from other experience it is known that consecutive may be, or seem to be, wholly free of the Peyerian lesion. Symptoms were of life, do not end in the diagnosis, unless their import rather knowledge, probable, or performance of the gut.	19 It is possible to embrace, or five phases, the above lesions with those of typhoid; yet not as to further result, the anatomical differences being fundamental. The remarkable thesis here is the universal connection of blood stasis and ulcer, at least when the ulcer is small; and the spots above described seem to show that if this period had been long enough, a wider necrosis of the mucous might have occurred. I note that much of the petechial aspect consists in mere blood-stasis, as upon a level analogy to embolised vessels; the same deep-tinted stasis, might become more fixed and constricted analogous. The part of interstitial canal here included is the same as to typhoid, but there is not the same limited tissue neglect-ance.

The Peyerian Lesion—Has been already above described in its main associations, but some details were purposely reserved for separate record in this sub-section; as was also an intercomparison of the examples amongst themselves, and collectively with the 'typhoid' form. The illustrations with their descriptions should be referred to: every example has been figured.

The plan of examination was to scrutinise repeatedly the opened gut, inch by inch, under a shallow layer of clear water or other medium, by both naked eye and with lenses magnifying 2—4 diameters; in a good light, and after careful pencilling with a soft brush to remove mucus, without injury to the villi or tearing of cavities: vertical sections being made when desirable, under water and sustained in position without stretching, to avoid distortion. The subject being a novel one to me, it was only after some experience that remains of the follicular areas came to be promptly recognised: there being sometimes mere traces at a spot on one side of the ulcer, and so small as to risk being overlooked; especially in fresh specimens, where the blood discolouration and turgescence of the inflamed tissues tended to obscure their mutual prominence and relations. After soaking in dilute Alcohol, Carbolic acid or Salicylic acid solutions (of moderate strength the better), there is less difficulty in recognising the surface structures of the mucous membrane, and the limits of the successive layers in the coats of the bowel; with, however, the inevitable disadvantages of blanching and some shrinking or corrugation of the tissues, which being differently affected by the medium used become thereby somewhat displaced. Areas seemingly unchanged were directly compared with those diseased, and both also with a normal control-specimen from a healthy subject. Other details are furnished below under the head of Histology.

For convenience sake, only samples have been tabulated here: from Cases *No.* 1 as an uncomplicated type, *No.* 3 complicated with severe lung-lesion and rather nearer approaching veritable 'typhoid,' *No.* 4 a simple minor and more limited form, and *No.* 5 closely associated with intestinal petechiæ and

inflammation of the cæcum: the above being preceded, for comparison, by a summary of the Typhoid features taken from standard medical works. The several headings discussed were selected to ensure as complete a view as practicable, of the anatomical characters of the Peyerian lesions. The non-tabulated specimens are—*No.* 2 from a country patient with ulcers higher up remarkably straight, narrow and transverse (see PLATE 1*a*) and below near the i-c. valve, as is usual, broader not deeper, their connection with Peyer's patches being unusually obvious; *No.* 6 an isolated ulcer at lower part of Jejunum (by estimate of its distance of 6 feet below the pylorus), yet quite like individuals amongst the rest (see PLATE 1, fig. 4); *No.* 7 a striking instance, not however anatomically diverse (see PLATE 1*c*, fig. A); *Nos.* 8 and 9 are isolated small lesions, introduced to render the record less incomplete; and *No.* 10, a late and newer form showing transition to a chronic variety, yet to appearance structurally allied to the acuter earlier seen (see PLATE 1*c*, Fig. B). It is not supposed that any essential difference obtains between the tabulated and non-tabulated series; and the materials for an ample comparison of the latter with the former, and also with 'typhoid,' may be found in the Cases themselves. I have, lastly, to add the remarkable specimen from Case *No.* 2*, which on account of its clinical characters chiefly, has been ranged next to the earlier examples in the List. *Vide* PLATE 1*d*.

The following is a summary of the coarser changes seen in other parts of the alimentary canal, besides those the site of these Peyerian ulcers. It is to be noted that the autopsies were commonly practised a very few hours after death, and in no case after decomposition had commenced: consequently, there never seemed grounds for attributing the morbid appearances to incipient putrefactive agencies. Also, I had in mind the local stimulating effects of alcoholic and similar remedies usually administered towards the close of life. And as regards the *Contents* of the canal above, thin discolouration by bile, drugs and milk or other liquid food, was usually noted without much importance being attached to it; seldom here was an

excess of mucus very marked, and only once some traces of blood: lower down the smaller bowel, feculence was always detectible in some amount, and sometimes little changed even in the neighbourhood of the ulcers themselves; free blood in quantity never being seen, or puriform liquid or even much serous. Only along with dysentery, were the contents of the large intestine manifestly altered considerably. Pea-soupy, fœtid, shreddy stools, such as ascribed to 'Typhoid fever,' were always absent. As regards the *Stomach* no uniform departure from the usual or contingent seen—except in Case 5: where with numerous sub-serous petechiæ below there was a larger one towards the cardiac end of the stomach, the mucosa within being pallid opposite the same spot, and the intervening musculosa untinged notably: also in Case 6, there were many minute sub-mucous petechiæ towards the pylorus, with none in the duodenum below, but larger streaks and an ulcer in the jejunum. *Duodenum*—was essentially unaltered in all the cases examined: softening absent. Brünner's glands when sought for, not prominent: no ulceration. *Jejunum*—commonly unchanged in aspect: sometimes hyperæmic in patches, and in No. 1, I detected with the lens pale atrophic spots and areas not conspicuous to the naked eye: a few ecchymoses also in *No.* 3; *No.* 6 was exceptional in presenting sub-mucous extravasations, and an ulcer (*vide* Case) such as in the other instances existed only much lower down in the Ileum.

The *Ileum* at its upper part (*circa* 10 feet above the ileo-cæcal valve, where it is estimated to begin), might be quite free of change. Hyperæmic patches and spots are sometimes recorded, yet not uniformly: in Case 1 such looked much like erosions, but upon close scrutiny were found to be simple stains from lodgment of a little blood between some valvulæ conniventes; the blood-clots contained ova of lumbrici (the parents here too), and ova were found elsewhere without blood: this is mentioned as a warning to other inexperienced observers. Between hyperæmic patches there were pallid areas, and so lower down the bowel: the ulcers also were distributed in a similar disseminated manner. The congested or inflamed areas

were usually around Peyer's agminated 'glands,' yet not invariably. The distance above the ileo-cæcal valve at which ulcers appeared first, varied from 3 to 6 feet, seldom higher; there was no absolute uniformity here, and reference should therefore be made to the individual cases—also to the Table here for samples. It was evident that the spots of deep hyperæmia and blood-stasis, and those presenting ulcerations, were of of similar character; being apparently selected, though without obvious rule; it was also apparent that the mucous folds, and the sides and ends of the Peyerian areas, were commonest amongst such sites; and finally, that hyperæmia and extravasation deepened downwards towards the end of the ileum, as a rule.

These remarks apply to aspects in the fresh state, parts preserved in spirit losing their red colour after an interval beginning after a few hours. The fresh aspect was that of active progressing changes (except in *No.* 10), giving the impression of an acute process but recently commenced; and the only visible differences above and below were so slight as to impart the idea of a nearly simultaneous date of all the lesions, the hyperæmic together and the necrotic together. An ulcer, however, might have paler surroundings than a spot of stasis and inflammation; yet it would not be indurated around, or coated with granulations; and I never saw clear signs of incipient cicatrisation. A thick, adherent, yellow-tinged slough upon an ulcer, was not seen; usually the base was level and bare, exposing the greyish sub-mucosa, or brownish circular muscular coat; occasionally a thin grey or yellowish slough at bottom remained, on the larger ulcers. The necrotic process seemed to consist in active molecular disintegration, resulting on hyperæmia and localised blood-stasis; and more or less acute in progress and extension: the direct association of the whole with turgescence of one or more larger converging or diverging blood-vessels, being sometimes very evident. The stages in such process appeared only a matter of intensity or degree; an incipient necrosis being from its beginning an atrophy or wasting, although attended with vascular turgescence in varying

amount. Probably the sub-mucous blotches at side or end, or in centre, of a Peyer's patch, were the earliest signs; because over such spots the mucosa was usually softened, depressed, dark-grey, and deranged in structure as seen with a lens. A small ulcer may be deep and defined. The signs of vascular determination around may there not be considerable, a certain opacity by transmitted light alone persisting; and on section a quasi-œdematous state of the sub-mucosa, with a minute punctum or streak at edge of ulcer: the outer muscular and serous coats being virtually unchanged in aspect. An atrophied state of the rest of the Peyerian area, as estimated by a thinning visible by transmitted light, was common. The general mucous surface seemed also similarly thinned in places; the larger blood-vessels near appearing very dark. Further details are given below in PART II. I have only to add here that, judging from these coarser appearances, all the forms of Ileac ulcer under review seem to me of closely similar character; their differences being comparatively slight, and not more than was probable from their varied associations and varied degree of development. The Table is arranged for ready comparison of this Lesion with the Typhoid ulcer proper; the discussion of such comparison being reserved for the section which hereto follows.

Part II.

DISCUSSION OF DATA.—A. *Identification and General Relationship. B. Histology and Pathogenesis of Lesion.*

A. ITS IDENTIFICATION AND RELATIONSHIPS.

1. *Apparent Identity as a special lesion.* Upon various grounds, I must regard the instances now brought together as forming a connected group. The Etiology of the cases may seem obscure and possibly diverse, yet there is nothing to contradict and something to support the view that 'Septic' or insanitary influences had been always in operation. The Clinical symptoms directly due to the lesion were slight or

wanting, except by accident, and thus an important means of identification becomes deficient: those attending the illness throughout in the two first cases, seem to me both well-defined and characteristic enough to warrant a nosological place of their own—the nearest analogues being amongst 'Septic' fevers or forms of the 'Typhus' genus, as I should understand the term. When associated with other lesions, such were eminently those pertaining to insanitary (or pythogenous) blood-deteriorations. The identity of this series of examples *inter se* is, I consider, further established upon anatomical grounds: thus, I find a common *locale* at the end of the Ileum, naturally selected because there abound most the 'Peyer's patches' which constitute the particular site common to all the ulcer-lesions: other proper features are a certain limitation of size, and such an inclusive resemblance in form and aspect as alone would suggest a similar mode of origin and extension; the strictly partial implication of the Peyer's patches—oftenest at contour or ends—and the interrupted dissemination of the ulcers when multiple, are also special conformable characters. In more detail, these ulcers seldom exceed ½ in. to 1 inch in longest diameter; are sharply defined around and below; in shape elongated, starred or irregular; in direction oblique or transverse to the long axis of the gut; they occupy the common mucous plane, having edges somewhat tumid, inverted or undermined, with floor funnel-shaped or level, and covered with greyish connective tissue, which may be reddish and somewhat nodulated at the sides; the muscular coat is only sometimes involved, but interstitial necrosis may lead to thinning and perforation of both it and the serosa. In a given case, the ulcers are mostly so nearly alike in maturity as to bar the idea of their gradual formation by breaking down of a prior induration or neoplasm, developed at succeeding spots in the mucosa; the impression imparted being rather of a nearly simultaneous production, in highly localised points; and that but recently before death, since signs of healing were never detected. Though originating commonly in immediate contact with lymph follicles, these ulcers seem to spread by preference crosswise in the course of

the larger blood-vessels: the follicles themselves are not primarily enlarged, but if changed at all are rather wasted, near and around the lesion; and unaltered or simply thinned Peyer's patches, usually intervene between those presenting ulcer lesions; near the ileo-cæcal valve, however, the patches are often tumid, the general mucosa being also more hyperæmic there than above, but ulcers are not invariably larger or more numerous here; the valve itself may be free. and at its limits the vascular derangement may promptly cease.

2. *Comparison with Non-specific Ulcers—e. g.*, the *Atrophic* (*a*), *Embolic* (*b*), *Peptic* (*c*), and *Catarrhal* (*d*). (*a*) I understand that simple primary atrophy of the intestines is variable in site and extent, that all the coats of the bowel are involved, softening co-existing, and the necrotic lesions not nearly so defined as here: the subjects, too, have been the aged or highly anæmic, or those suffering from general exhaustion, or from privation, combined usually with diarrhœa or dysentery; when croupous exudations, hæmorrhages or suppurations in both small and large intestines co-exist (*vide* Catalogue of the Pathological Museum at the Medical College, Madras): it may therefore, suffice to state that in my typical cases such local and general conditions did not prevail, and any similarity would be casual only when arising from a superadded specific poisoning. Atrophy of Peyer's patches in conjunction with general emaciation is not infrequent, but since my enquiries began I do not recollect seeing distinct ulcers upon such atrophied patches. (*b*) Simple embolic necrosis I regard as a quasi-mechanical result of the plugging of a small blood-vessel of the bowel, either by an embolus conveyed from the heart or a larger artery, or by a thrombus formed on the spot in connection with an altered state of the circulation or of vessel-walls; and judging from the few specimens and records I have had access to, the necrotic lesions so resulting are neither like nor so localised as in my cases; where, besides, neither retarded circulation nor endocarditis, valve-disease or endo-arteritis, was noticed during life or after death. (*c*) Intestinal ulcers of peptic origin are rare and limited to the duodenum (an excellent example is in the

Grant College Museum), though similar ulcers in rare instances have been met with in the jejunum and colon (Prof. Leube in Ziemssen, Vol. VII.): their prototype is the simple round ulcer of the stomach, and when acute the mucous membrane is softened and the most widely eroded (not so in my specimens), when chronic the edges though defined are not infiltrated with cells (but such I do find); and, besides, authors do not mention implication of the Peyer's patches (as obtains here). The subject of 'perforating' ulcers of the small intestine as belonging to the group of 'peptic' ulcers has not, that I am aware of, been perfectly elucidated: doubtless it is conceivable that acrid intestinal contents might, like gastric juice, corrode damaged tissues, and the means of diagnosis during life might be wanting. Obscure instances ending fatally are on record—see Niemeyer's Text-Book, Vol. I., and possibly some of those cases alluded to in the Appendix below, the Indian series—of my specimens No. 6 might, I once thought, be analogous, but the evidence appeared on further consideration to be not in favour of such view. (*d*) Catarrhal ulcers are preceded by acute or oftener by chronic inflammation of the mucous membrane, the symptoms and signs of which during life and after death were wanting in my cases: for the hyperæmic areas sometimes found in jejunum and ileum were sparse, non-continuous and limited to a length of 3-6 inches, where the gut-walls were thinned, deeply-stained or petechial, with no pus secreted or lymph-follicles protuberant. Catarrhal ulcers in the form of surface erosions or confluent pustulations, as commonly portrayed belong almost exclusively to the cæcum, vermiform appendix and rectum, very rarely occurring in the small intestine: the 'follicular' ulcers are described as pertaining to the colon. Moreover, so far as I can learn, the term 'follicular enteritis,' as applied to the small intestine, arose at a time when the lymph follicles were regarded as open cavities subject to ordinary inflammation, at such date genuine 'typhoid' being yet undiscriminated: it is not used by Rokitansky or his followers. A disseminated quasi-catarrhal inflammation of the jejunum and ileum, known as 'psorenteria,' is even now mentioned (*e. g.*, by

Cornil and Ranvier, 1884,) as a form of 'ileitis'; but it is then said to exist only as a complication of cholera, typhoid, and most of the infectious and exanthematous diseases, also of puerperal fever. See below, heading 4, for further discussion of this point with reference to my series of cases—one of which, No. 7, was first regarded as being 'choleraic.'

3. *Comparison with Specific lesions*—using this term, for convenience, in a wide sense; and as inclusive of both inflammatory (*a*), and neoplastic necroses (*b*). (*a*) Specific inflammations of the small intestine known as the 'croupous' and the 'diphtheritic' have within my experience at Bombay had a similar apparent origin to the Ulcer-lesion, in blood-poisoning from insanitary agencies; and it is noteworthy that they were, so far as known, terminal phenomena to a prior and more or less prolonged attack of "Fever" (the 'remittent' fever so-called). The like were also witnessed by me about the acme periods of the 'spirillar' infection (*vide* "Spirillum Fever," 1882, p. 215). They have therefore, in my opinion, a certain etiological and clinical connection with the Ulcer-lesion under notice. The fever attending these intestinal inflammations may end suddenly with collapse, much as was seen in the present series, Nos. 4 to 7: and moreover incipient sloughy areas, which had a kind of analogy to the diphtheritic, were seen along with the ulcers in Case No. 3, and a distinct croupous exudation in Case No. 7. Further, the concurrence of 'granular' exudations with some cases of Dysentery, of which I have seen several instances, leads by a natural transition to mention of the not infrequent conjunction in my series of dysentery with the Peyerian ulcers—see heading No. 4 below. Reserving abstract discussion, it will be sufficient here to note that there was very seldom any likelihood of confounding the ulcers with these wide exudations and superficial necroses; and besides in the typical cases Nos. 1 and 2 such exudation was entirely absent, and thereby proved to be no essential part of the ulcer-formation. (*b*) The specific neoplastic necroses include the syphilitic (1), tubercular (2), and typhoid (3). (1). *Syphilitic* gummata of the mucous membrane or other tunic were absent here, and so elsewhere

in the body, in every case. I am not aware that they affect particularly the Peyerian areas of the ileum. Lardaceous infiltration of the bowel was never, I may observe, demonstrated in my cases. (2) *Tubercle* was invariably absent in, near or around these ulcers, and also absent from the lungs and other organs, in every instance; although it might obviously have co-existed with the lesions. Tubercle of the intestine alone, is said to be excessively rare: otherwise, as to site at end of ileum, in a somewhat puckered aspect, and in a partial implication of the Peyer's patches, with a tendency to spread beyond the follicular area in a transverse direction, there was sometimes a nearer approach to the Tubercular than to the Typhoid lesion, of the Ulcers under review. But the simpler genesis and structure of the latter are absolutely different, and their discrimination is therefore easy under ordinary circumstances; should tubercle exist elsewhere in the tissues it can with due care be recognised, and the intestinal lesion would be diagnosed according to the facts ascertained regarding the presence or absence of the tubercular neoplasm in and around the ulcer.

[Since these lines were penned, there has occurred at the J. J. Hospital, a striking example of acute tuberculous disease of the intestines; ending in the formation of numerous ulcers, perforation of the ileum, and fatal peritonitis. With respect to the subject of the present Memoir, this case is remarkable enough to warrant its being detailed as follows:—

M., Mussulman, 30, in previous good health and not scorbutic; a sailor living on board a ship recently arrived at Bombay; was suddenly and unaccountably seized with abdominal pain and obstinate constipation, and not finding relief by treatment aboard was 8 days later brought to hospital. There his symptoms, for the 3½ days longer that he lived, were those of insuperable intestinal obstruction combined with peritonitis; the abdomen being distended and tender, vermicular movements apparent at first and the vomit being finally stercoraceous; urine was plentiful, pale, clear, slightly albuminous; the temperature ranged from 98·4° to 99·2°, the pulse 90-96, respirations 30-36; there was no cough; depression great, and active treatment by enemata and opiates with belladonna unavailing. The evidence of peritonitis was held to contra-indicate surgical interference. Death by asthenia.

Autopsy 3 hours later, at which I was present and carefully scrutinised the parts when fresh, as well as repeatedly later when preserved. Diffuse peritonitis with soft adhesions of the distended small bowel, and some turbid liquid effusion. Termination of ileum lodged in the pelvis and collapsed; the whole length of large intestine contracted and hidden. About 3 feet above the ileo-cœcal valve and somewhere near margin of pelvis, where lymph and tubercles on the serosa were most abundant, the calibre of the gut had suddenly undergone a change without there being any cicatrisal or other mark of tight obstruction—though possibly a twisting had also been present. The coats of the upper distended bowel were much infiltrated with gelatinous matter, and all the mesenteric glands were enlarged, reddish, soft, and imbedded in a similar material. Vascularity was not excessive, short beaded lines of whitish tint could be detected along the serosa in several places, chiefly in the sub-serous tissue and soft adhesions. On laying open the intestines, the mucous membrane above (duodenum and jejunum) was found highly œdematous, darkly pigmented, hardly softened; and reddish in places where some shallow, transverse erosions could be seen: Peyer's patches not apparent. Four feet onward in the jejunum, a narrow, vivid-red, and turgid ulcer ($1\frac{1}{4}$ in. by $\frac{1}{3}$ in.) along one of the valvulæ conniventes, at the free border of gut but not distinctly Peyerian in site; a few inches lower other ulcers, also narrow and transverse; then hyperæmic areas, and a continued series of larger ulcers at short intervals, of more irregular, spreading shape and tending to blend when near together; many smaller blood-stained, narrow, transverse and parallel erosions intervening: still the Peyerian areas not distinct: the pigmented slaty hue here less marked. The smaller ulcers frequently at or near attached border of gut; solitary lymph-glands not seen. In the hugely distended ileum, the ulcers became more frequent and were often blended into areas of 3 in. or more by 2 in.: about 6 feet above the ileo-cœcal valve they were rather fewer, yet hardly less in size, and some had nearly or quite perforated the coats of the bowel: the Peyerian areas were still unseen, either free or connected with the necrotic lesions; sometimes the mucosa had a purple or a greenish hue, being yet entire, and nowhere was any distinct croupous or diphtheritic exudation detectible. Lower down, the ulcers again bec me large and numerous, and close-set; until within about 3 feet of the i-c. valve, when the sudden contraction in the calibre of the bowel was noted, its circumference being reduced from 4 inches to $1\frac{3}{4}$ inches; and at this part there were some superficial honey-combed ulcers, possibly belonging to Peyerian areas which, however, were certainly not elevated or prominent but rather effaced by erosion of the follicular pits (as the excavations seem to be). The mucous membrane of the dilated part of the bowel is comparatively smoothed out by stretching, has often a reddish hue, and a dotted aspect as of petechiæ. The lower 3 feet of the ileum is shrunken, ulcers exist here, too, some of which have perforated, they are rather smaller but more nodulated

in aspect; the mucosa is folded, turgid and hyperæmic; Peyer's patches not more apparent than above. The Ileo-cœcal valve is almost destroyed by sloughing and ulceration, which extend into the cæcum and ascending colon. The transverse and descending colon are inflamed and hyperæmic, but not ulcerated; the mucous solitary glands are not prominent anywhere in the large intestine; the meso-colic lymphatic glands are much enlarged.

The contents of the smaller gut consisted of a very copious, thin, brown grumous liquid, having a distinct fecal odour. Below the constriction, and in the large intestine, were some greyish-yellow and consistent feculent masses.

The intestinal ulcers mentioned above were of a vivid, blood-stained hue which was visible outside but did not permeate below the sub-mucous connective tissue: their edges were tumid or œdematous, jagged, hanging, and much undermined; their base studded with gelatinoid nodules seldom white or opaque, but sometimes bile-stained and mixed with shreds of sloughy tissue. Caseous tubercles were not visible at base or edge of the ulcers, in the fresh state; nor were firm miliary nodules very distinct here.

The mesenteric glands seemed uniformly tumid on section, no caseating material being visible in those examined.

After soaking for 24 hours in a weak solution of carbolic acid, the parts were re-examined; and in the jejunum, I could detect at the edge of some ulcers, the scanty remains of unaltered Peyerian lymph-follicles. And so in the ileum, occasionally a few follicular pits around some necrosed areas seemed to show their original Peyerian site; but there was no sign of follicular enlargement or infarction preceding the necrosis, and only in the lower contracted part of the bowel were a few (3 or 4) Peyer's patches detected after long search; these being small (under 1 in. long) greyish, depressed, and of decidedly atrophic aspect; their smooth surface, almost devoid of villi, presenting only sparsely scattered shallow pits, corresponding to site of subjacent lymph-follicles themselves not enlarged. A small transverse ulcer might be present upon such a patch. Plain atrophic areas were sometimes near. The mucous folds bordering the patch might be rather turgid and reddened. Marks of cicatrisation were not detected in any part.

As compared with the earlier ulcer-lesions in this Essay termed 'Septic,' the ulcers in this case were alike as to sites, dimensions, form, and a certain general aspect. They differed in their thinner, redder and more undermined edges; and in their highly nodular base, with its frequently stringy and sloughing surface; and upon section, I found the morbid changes to be at first wholly limited to the mucous membrane itself. It is probable that the nodular masses forming the thickened floor of these last-named ulcers were in part at least of tubercular character, though not caseated; and the presence of numerous opaque nodules in the serosal lymphatics being un-

mistakable, the universal and larger implication of the corresponding mesenteric glands would serve to confirm the evidence of a dominating tubercular character in these lesions. The presence of miliary and caseating tubercles in both lungs of this patient (see below) completes the demonstration here of an acute general tuberculosis; such as was entirely absent in all my previous Cases, without any exception whatever.

Such a discrimination being clearly made, I am now free to remark, first, that I was not previously aware how close might be a general similarity of the 'septic' and 'tubercular' intestinal ulcer-lesion; and next, that it is obviously conceivable (as before suggested) that a septic process might be associated with the tubercular, with the result of a common modification of their aspects. In precise language, moreover, neither the essential character nor the coarser manifestation of both species of lesion, are so far apart as was formerly, and even yet is, by some authors laid down. Thus, for example, as regards the nature of the infections underlying both series of lesions, Professor Ziegler (*l. c.*, p. 295) concisely embodies the modern view in his statement regarding Intestinal mycosis (*enteromycosis bacteritica*) as a general term for several affections usually regarded as distinct, "that strictly speaking it is applicable to tuberculosis, to typhoid, and perhaps to some forms of dysentery"; and to this same list belong also intestinal anthrax and various forms of toxæmia, including certain septicæmic affections, as this author goes on to state. And as regards the lesion *per se*, Professor Leube (in Ziemssen, *l.c.*) commences his account of Tuberculous ulcers with the remark that "the only way we can be absolutely certain of the tubercular nature of intestinal ulcers, is to include under this head only those ulcers in whose immediate vicinity miliary tubercles can be detected. When the tubercles have undergone *complete* caseation certainty in diagnosis is impossible; and the tuberculous character of the ulceration can be inferred with some degree of probability, only when the other lesions in the body point in this direction."

The following extract from the J. J. Hospital records, summarises the other lesions in the present case:—Brain not examined. Lungs—Old adhesions at apex of Left lung, where too are numerous patches of consolidation seemingly of bronchio-pneumonic character, and partly or wholly converted into tubercle, which has sometimes become caseated and in one place broken down into a cavity the size of a walnut, with smooth walls; weight 11½ ozs. Right Lung—Many nodules of consolidation scattered throughout both lobes, some of which are becoming caseous; weight 10 ozs. Heart—Seemingly healthy; weight 5½ ozs. Liver—weight 50½ ozs., of normal aspect. Spleen—Normal in aspect; weight 7½ ozs. Kidneys—healthy looking; weight 4 ozs. each. (The Trachea and Bronchi were of normal aspect.) According to my apprehension there had occurred here an acute tubercular infection of the system, starting from a focus in the lungs, and

particularly remarkable for implication, elsewhere, almost solely of the intestinal mucosa with the lymphatic glands appertaining thereto.

While, thus far, there is clear and conformable evidence of the tubercular character of the intestinal ulceration in this instance—bacteriological testimony not yet sought for—I would state that I did not anywhere see distinct proof of the 'tubercle' being deposited within lymph-follicles themselves; but on the contrary, when annexed to an ulcer, the follicular tissue was always of wasted aspect: and, further, such Peyer's patches as could be detected lying between the ulcers, were all similarly atrophied. (*Vide* PLATE 2*, Fig. 8, and the description.) Such histological data are noteworthy, as tending to approximate the acute tuberculous ulcer to the 'septic' as already defined. However, from a review of the whole record, I conceive it possible here was a combination of two infections, usually found apart: an alternative view being that the acuter form of intestinal tuberculosis itself differs from the common chronic variety—*e.g.*, of Phthisis—as regards some histological features; and also, I would add, regarding the liability to induce perforation of the bowel and diffused peritonitis—which very rarely indeed occur in Phthisis.

The example just narrated shows that the Septic ulcer proper may be simulated in part by the Tubercular, as well as by another species next to be contrasted.

(3.) Comparison with *Typhoid*. From the preceding account, it may be surmised that the nearest analogue of the affection under review, is the 'Typhoid' infection with its results. A comparison between these would best be made by means of Indian specimens of both diseases, but genuine enteric is very rare amongst Native Hospital patients; nor can I learn that typhoid in India displays unusual characters; and therefore I have here freely consulted the European authorities. The so-called hybrid form of 'Typho-malarial fever' will be alluded to presently. Though unselected and valid as they stand, my cases are too few to warrant more than a presumptive inference: the earlier ones are best suited for comparison with typhoid; being all of fatal character, they should of course be contrasted only with fatal cases of typhoid as regards their clinical features; but this is nearly impracticable, and I have not attempted more than an outline here. The following is a brief summary of points of resemblance and of difference between the Indian Septic cases and ordinary Enteric:—

Etiology.

Typhoid.	Septic.
An origin in connection direct or indirect with filth products; source of infection usually traceable, and outbreaks often endemic or epidemic.	Origin not traced especially to such insanitary influences; seems rather connected with individual state; but indications of a diffusion of cases may concur.
Younger residents and new-comers most liable.	All patients adults, but some recent immigrants.

Clinical Features.

Pyrexia tolerably regular in mild cases, no rule for the severe or fatal.	Pyrexia in first 2 cases for 14 days not unlike Typhoid, and so Case No. 4 later on; in others a distinct tendency to final collapse.
The eruption peculiar in aspect, dates and course.	Eruption only once noted, and later, and briefer.
Diarrhœa of peculiar character the rule.	Diarrhœa only once, and not peculiar.
Peritonitis from perforation of the bowel quite peculiar, except in rare cases of Tuberculosis and Dysentery (Murchison).	If so, then Cases 1 and 2, also 2* and 3, should be regarded as Typhoid; yet their lesions do not correspond—therefore *dictum* opposite to be modified.

Anatomy of Lesion.

Locale at end of Ileum	Not so uniformly and regularly so here.
Peyer's patches the special site, and those lowest down, (*i. e.*, the largest) most implicated.	Not so markedly Peyerian, or so exclusively, or the lowest patches most.
Solitary glands occasionally affected there.	Seldom even visible.
The ulcers are multiple	May be single; otherwise more numerous than the rule in Typhoid (17: 10).
Their size varies	Dimensions smaller here.
Their form varies somewhat	But is never narrow and transverse as here.
Their edges are red, raised, undermined.	But not as here, deep blood-stained, infolded, puckered, or punched out.

Typhoid.	Septic.
The base is covered by a yellow slough.	Here slough far scantier; adherent, greyish; and usually absent.
The ulcers are often deep and penetrating.	But not the smaller ones, and not funnel-shape or obliquely directed as here.
Certain stages of formation appear, such as congestion, swelling, induration, disintegration and sloughing, prior to the ulcer-condition.	Corresponding early stages not seen here; ulcers commence by loss of substance, by direct softening and disintegration: the scanty attendant swelling and induration are inflammatory or vascular, and limited to margins of ulcer. Atrophy around may co-exist.
The earliest and largest ulcers are nearest the i.-c. valve, and limited to Peyerian area, involving the whole area.	Not so here—the region near the valve may be free; entire P. area rarely involved; and a marked tendency to spread laterally beyond P. limits.
A strong tendency to heal, since recovery the rule.	Not so here; perhaps septic ulcers always of fatal import. Cicatrisation never indicated.
The same specimen shows all stages.	Not yet seen nearly so distinctly here.
The lesions appear at a certain early date of illness.	The lesion supervenes as a late or superadded phenomenon, possibly incidental to the severest common infection, or to a combination of infections, or to a rare special form.
Aspect of lesions subject to several modifications:—an arrested or imperfect development; a diffused form, or slow, scanty advance or retrogression; or an excessive development, tumultuous and numerous, or extending above and below the ileum. (Rokitansky).	So far as I comprehend, the coarser characteristic of Typhoid (its neoplasmic follicular swelling) must always be present; while a copious cell proliferation is not the prime feature of the Septic lesion. And if the histological difference be one of degree, or any-way transitional, still the naked-eye aspects have always seemed practically distinctive. No modification of typhoid I know of, could wholly resemble these Septic lesions.

Typhoid.	Septic.
The Mesenteric lymphatic glands are invariably, early and largely implicated.	Not so here; though doubtless commonly inflamed, yet not nearly so strikingly involved, as a rule; this *datum* indicating the blood-origin and local character of the septic follicular lesions.
Genuine Typhoid when severe or fatal, is commenly attended with distant local inflammations (Pneumonitis being one of the most frequent): the large intestine is involved in about ¾ of fatal cases; and Dysentery, it is said, may co-exist with typhoid.	The 'fever' attending the production of Septic intestinal lesions, presents a similar variety of complications, death in my cases having ensued upon peritonitis, asthenia, pneumonia or dysentery: and such analogy, whilst not implying an identical character, yet favours the view of a parallel character of these two general diseases.—See heading 4 below.

The comparison thus made is unavoidably imperfect as regards etiology and the clinical histories, and admittedly my cases are too few to warrant a wide generalisation. Besides, difficulties are not lessened because of the allowed vague character of Typhoid itself; thus, its sporadic cases and the beginnings of an endemic, may be quite obscure in their origin; and, clinically, it is said that "no acute disease presents itself under a greater variety of forms than Enteric fever"; and again, "there is no relation between the extent of the disease of the intestinal glands, and the severity of the cerebral or abdominal symptoms," (Murchison, *l. c.*, p. 629). Indeed, I can hardly avoid the suspicion that more than one kind of toxæmia and lesion have sometimes been designated by the term 'Typhoid' or 'Enteric'; and though there seems little likelihood of a careful observer confounding the malady under notice with ordinary enteric, still there is a risk of hasty judgment in the way both of over-refinement and of non-discrimination. As regards anatomical points, I have above limited comparison to those I could verify in the few specimens of Typhoid actually in hand; to make up deficiency here no sufficiently elaborate description of the enteric lesion is available with me, but from general knowledge I consider it probable that the ordinary

follicular changes of typhoid are in many fatal cases complicated with morbid alterations of non-follicular character. The Septic cases show (and fuller details could be added) the following features superadded often to the ulcer-lesion: (*a*) Spots of atrophy of the mucous membrane at the outskirts and above the Peyerian necroses, non-hyperæmic P. patches may be thinned or wasted, as if blood-supply were there defective in quantity and quality: (*b*) Concurrence of excessive local vascular disturbances, in the form of blood-stains, stases or extravasations, and of croupous, diphtheritic or gangrenous inflammations (also atrophic in aspect), intermingled with the follicular lesions; and in consequence (*c*) an extension of morbid lesion beyond Peyerian limits. The present record is purposely limited to instances showing ulcers comparable with the typhoid; but other cases are in hand showing different or minor changes of the mucosa, which may belong to the same series; for probably all such are examples of 'blood-poisoning.' How frequently (*b*) and (*c*) concur in fatal enteric fever, I am unable to learn; but, as intimated, think it likely that they could generally with due attention be found present after death, even if not so apparent as in my series. Undoubtedly, too, "Septicæmia" may prove fatal without inducing a manifest intestinal lesion; and it has been remarked of "Typhoid," that while the local affection of the mucous membrane is constant, still being occasionally subject to an arrest of development, we find solitary exceptions in which there is no intestinal affection ...or indeed the typhous process without being localised (anywhere) may run its entire course in the blood. (Rokitansky, *l. c.*, p. 82.) Viewed generally, I regard typhoid as but one of the pythogenic infections, whose particular virus has in temperate climates commonly assumed the characters of a 'pure culture'; whilst in the tropics other forms of sepsis tend to prevail, to the exclusion of typhoid. This may be said without implying that the lesions I have above described, take the place of the ordinary enteric (for there is no valid evidence to such effect); only we see here occasionally, and possibly oftener than in Europe, a Peyerian lesion comparable to it.

3*. Under the present sub-heading, as being most conveniently arranged between Typhoid and the Intestinal Mycoses to be presently considered, I would offer a short comment on Malarial and on the so-called Typho-malarial lesions. First, as regards the *Malarial* infection, I am not aware from either personal experience or those writings hitherto accessible, that un-mixed malaria, however intense, ever induces a special ulcer-lesion of the Ileum ; but localised and disseminated hyperæmias of the ileac mucous membrane are not uncommonly recorded in fatal cases, and such changes I know to be the usual attendant of minimised blood-stases and necroses, which have for their special site the Peyerian follicular-areas. And in fatal fevers ('so-called remittents') complicated, *e.g.*, with pneumonia or dysentery, the indications of a Peyerian lesion resembling that under review, are far from uncommon or obscure, judging from cases now before me. According to a series of observations made recently, pigmentation and atrophy are the commoner malarial sequelæ ; and I find that whilst pronounced Melanæmia is very rare in Bombay patients, yet a decided pigmentation of the intestinal mucosa is frequent, and may particularly affect the Peyer's patches in a striking degree : some vascular congestion usually co-exists ; concurrent wasting is not invariable. Without a general body-emaciation, atrophy in various degree of the P. patches seems rather frequent in the bodies of Hospital patients, who would be called 'malarious' subjects ; it requires care to be detected, and it co-exists with either pallor or hyperæmia ; it seems referable to impaired nutrition, either languid or promptly ensuing ; and since marks of blood-stases near or around the affected patches were sometimes noticed, at points which correspond to the sites of the Ulcer-lesions under review, I am led to connect anatomically at least such instances with some of that series of the less acute form, *e. g.*, No. 10, in which the really vague transition between atrophy and complete absorption leading to an ulcer, was fairly manifested. That experience here is not peculiar, is shown by an observation of Surgeon-Major F. H. Welch (A. Prize Essay, 1883, p. 144,) on autopsies practised at Netley : " Malaria is

"often associated with atrophy and in two instances while the "upper glands (Peyerian) are noted as atrophied the lower "were ulcerated"; the form of ulceration is not mentioned. I cannot but regard the malarial infection itself as a form of 'sepsis,' resulting from plant-decay or such form of putridity necessarily connected with a definite bacterial agent; and undoubtedly it may after become associated, like other specific infections, with commoner pathogenic agents capable of inducing localised inflammations (complications) under various circumstances: nor can the Peyerian areas be excluded as possible participients of lesion, at times when much insanitation concurs with malarial influence. Nothing more perhaps can be said, until the *vera causa* of primary and induced or secondary infections be detected, isolated and tested apart.

Now that the so-termed "*Typho-malarial fever*" (with its synonyms in French, German, and Italian) has been formally admitted into the "British Nomenclature of Diseases," (R. C. P., London, 1885, p. 7), it becomes of interest to inquire if such Indian specimens as mine, do or do not correspond with those originally described by Dr. J. J. Woodward, ("Camp Diseases," Philadelphia, 1863, p. 99), as characteristic of his proposed new hybrid combination of the malarial and enteric fevers. I find it stated that this mixed fever-lesion consists in a gradual enlargement with ensuing ulceration of the closed follicles of the small intestine, which, while essentially quite like the corresponding changes in enteric fever, yet "differ from them in certain points which must not be overlooked." These points of difference seem to be the following:—first, as regards the ulcers originating in the solitary follicles, the enlargement is but moderate and its consistence soft, its hue being frequently blackened from pigment; and the ulcer ensuing may either remain small (1—3 lines across) or enlarge and invade the surrounding tissues, producing an ulcer (6 lines to 1 inch or more in diameter) "resembling the ulcerations of the patches of Peyer in character, though not in shape or situation;" but how their shape differs is not, that I see, mentioned. Secondly, as regards the larger Peyerian ulcers, it is stated that

as a general rule every patch is more or less involved, least high up in the bowel and most below; the "characteristic ulcer is oval in shape," and occupies more or less completely the tumid group of follicles, its edges being jagged and irregular, often undermined; its base of dirty-ash colour, often with a yellowish tinge, occasionally mottled with dark pigment: sometimes it is limited to the follicular apparatus, usually however at a later stage involving considerably the sub-mucous connective tissue and possibly the muscular coat, or even penetrating deeper and causing a fatal perforation of the bowel. Dr. Woodward next remarks that whilst the tendency to pigmentation is an early feature, in the later stage certain peculiarities appear which "cannot fail to strike the anatomist, and are often sufficiently distinctive to enable him to recognise typho-malarial fever by the *post-mortem* appearances alone;" *e.g.*, "the tumefaction in typho-malarial fever rises very gradually from the surrounding mucous membrane and attains a moderate degree of thickness (3—6 lines) on the edges of the ulcer"—in this respect, of course, differing materially from the ordinary typhoid lesion with its high, abrupt or even outward-bulging borders; hence, "the umbilical depression of the ordinary typhoid patch prior to ulceration" had naturally never been seen by the author in typho-malarial fever; and lastly, the extensive erosion in the sub-mucous connective-tissue more widely than in the glandular layer of the mucous membrane, is also designated as "characteristic" of the typho-malarial ulcer. The mesenteric glands here are enlarged, softened, and of livid purple colour on section, and frequently pigmented; the splenic enlargement is more constant, and generally more intense than that of enteric fever. In his account of the Chronic Camp Diarrhœa, Dr. Woodward states (*l. c.*, p. 242), that along with wide ulceration of the colon there was generally pigmentation and thickening, and in most such cases ulcerations of the Peyer's patches, not unfrequently resembling closely the ulcers of typhoid or typho-remittent fever, and that even in cases in which no febrile reaction had existed throughout the illness. After perusing this earlier work now quoted, the impression

left upon my mind was that the author had included under his new term both genuine typhoid and some other pythogenic lesions, like those met with in Bombay, for example, not discriminating between them; for although in the above descriptions (I purposely omit discussion of the clinical phenomena as being open to wide variance of opinion), the comparatively slight marginal and general tumefaction of Peyer's patches, and also the marked tendency of the ulcers to spread beyond follicular limits, are characters I have above especially insisted on as non-typhoid; yet as there is here no mention of the irregular form and transverse fissure-like shape, large number, small and more uniform dimensions, peculiar location on a part only of the P. patches, the remaining portion of which is not elevated, and the variable dissemination of the ulcers, which have unaltered Peyer's patches between them, and are not necessarily larger the nearer the ileo-cæcal valve, I cannot but infer that my Indian lesion had seldom if ever been seen in the then combating States of America. Whilst I am fully aware that one ought not to insist too much upon a few individual cases, when contrasted with a probably much larger number; yet I also know that unless valid discrimination be made, there can be no real advance in medicine. The example of Woodward in this instance seems to have been readily followed by Continental clinicians, especially the French and Italian; and I wish it had been possible, for further comparison, to quote some of their descriptions also; but when in Rome, for example (1881-82), I could learn nothing definite of the "typho-malarial" lesion, the distinction thus implied being apparently in the main a semeiological or an etiological one. And such, indeed, it shortly became with the originator of the term, for, in 1876, (Paper read at the Philadelphia Meeting of an International Exhibition, which has been very courteously forwarded to me on request from Dr. J. Billings' office at Washington), I find Dr. Woodward clearly renounced his opinion that the lesions he saw before 1863, could, by certain peculiarities be distinguished from those of ordinary typhoid; a larger experience, especially the examination of a large num-

ber of specimens received in the Army Medical Museum, convincing him that such opinion was premature. So that, at present, there seems to be no valid anatomical basis upon which to found the term "typho-malarial fever;" the lesion once connected with that term being only the ordinary typhoid lesion. Hence it may be said that the reticence of British Surgeons serving abroad, has been to a certain extent justifiable; and also that the warning of Rokitansky quoted in the Appendix, was a not unneeded one. Still, as regards the subject in hand, while much remains for elucidation by methods of research either renewed or amended, I feel sure in the absence of evidence as minute as my own, that the main features of a veritable non-typhoid lesion have been fairly established; and if this be disallowed, I should refer the cause of discrepancy to a too vague employment of the term "typhoid." The perhaps over rigid exclusiveness of some clinicians, the certainly excessive latitude of others, and the eclectic or compromising tendency of a third school, as displayed in definitions put forth, have indeed led to a confusion which only a fresh precise enquiry can dispel; meantime the plain, full, and careful descriptions of every variety of Peyerian ulcer met with in connection with signs of blood-contamination, cannot but be helpful, let the hypothesis attached thereto be acceptable or not. And it is not irrelevant to add that for acquiring an adequate knowledge of morbid changes of the small intestine, solely from spirit-preparations in which an artificial blanching, thinning, and contraction of the tissues necessarily ensues, a very careful and minute scrutiny is absolutely needful; for I find the aspect of fresh and of preserved parts to be strikingly different, as regards not only the vascular and exudation-hues, but also relative turgidity and prominence of the mucous membrane and the Peyerian areas; the latter after the prolonged action of dilute alcohol sometimes appearing to project more, from either their distension or greater shrinking of the mucosa around them.

Lastly, in the remarks above no allusion has been made to a second meaning sometimes attached to the clinical term of 'typho-malarial' or 'typho-remittent' fever; that, namely, in

which the adjunct 'typho' is affixed in order to express a 'stupor' (*typh*) condition, supervening on the effects proper of malarial infection ; and in such sense, therefore, meaning an approach to the adynamic and so-called 'typhous' or 'typhoid' state, rather than the superadding of a peculiar enteric lesion. This difference of signification now pointed out should be borne in mind, or confusion may become worse confounded.

4. *Final proposed Identification.*—Proceeding as above by the method of exclusion, and conducted by facts interpreted according to modern views, I am constrained to see here an infection of the system with a lesion which seems best regarded as a new-defined member of a generic *Septic* series. Thus, there is an etiological association with insanitary influences, and a clinical course like, yet differing from, either enteric or malarial fever; with a lesion somewhat peculiar in its vascular origin, and localised atrophy and necroses. The need of recognising such a larger septic group has been plainly indicated by Prof. E. Ziegler (in his recent Pathological Text-book, Engl. Trans., 1884, Part II., para. 477), who, after discussing dysentery, cholera, typhoid, tubercle and syphilis, accords a final place in this series of specific inflammations to the new heading of *Intestinal mycosis* (enteromycosis bacteritica) as a general term, including several distinct affections. "Strictly speaking it is applicable to tuberculosis, to typhoid and perhaps to some forms of dysentery. Usually, however, it is confined to intestinal anthrax, and to various forms of meat-poisoning, by which changes in the intestine not dissimilar to those of typhoid are sometimes produced." The only other details added by this author are a short summary of the lesion of intestinal anthrax (hæmorrhagic patches with sloughs over them, and near swollen lymphatic glands with bacilli in the blood-vessels and affected tissues), and the remark (with case) that "an affection of the bowel having exactly the same microscopic appearances is met with in septicæmic affections." In what particulars the first named changes in the intestine are "not dissimilar" to those of typhoid, is not stated by Dr. Ziegler; nor in the two last examples named of intestinal lesion (to which my cases Nos. 3

and 5 might correspond), is there any allusion to a special implication of Peyer's patches; the comparison expressed being, nevertheless, a sufficiently significant one.

Under varied designations, septic lesions of the small intestine have long been recognised; doubtless their forms and degrees are many, and such records as I have the means of comparing with my own data, are the following:—Rokitansky (*l. c.* p. 90), mentioning sloughings of the mucous membrane which occur with the symptoms of general adynamia and putrescence.....under the form of degenerated typhus, cholera typhus, &c., states that after the slough has become detached there is loss of substance in the mucous membrane, which demands some attention as it may be confounded with an intestinal ulcer...diagnosis being established by the existence of a concomitant cause....." the slough of gangrenous inflammation is distinguished by its oblong, striated form, and very varying site, by its defined contour, and by the absence of morbid growth at the edge, at the base, as well as in the circumference of the eroded part." While this concise description would not apply to my typical Cases 1 and 2, and to most of the others, it is to a certain extent illustrated by Case 3, in which along with the characteristic (as I regard them) Peyerian ulcers there were also found superficial necroses of the mucosa, median and inter-Peyerian in site, and as a drawing I made shows sometimes connected with an ulcer narrow and transverse, and partly covered with a yellow slough, the gangrenous area itself being covered by a greenish-grey slough; distinct remnants of lymph-follicles around the ulcer could not be seen with a lens, but my impression was that this lesion was Peyerian; in the notes of the case I have already mentioned other superficial median arrow-head-shaped (and striated) sloughy areas, summarily there termed 'diphtheria-like,' a drawing of which was also made. In PLATE 2, Fig. 6, are delineated dysenteric ulcers (with yellow sloughs on them) near to a Peyer's patch differently affected, for the purpose of showing such difference; and the conjunction is noteworthy, because dysentery may be of a septic nature. Again, under the heading

of Non-typhous intumescence of the intestinal follicles, Rokitansky (*l. c.* p. 88) more particularly alludes to the relation between "certain morbid states and this follicular apparatus," mentioning, first, diarrhœa (especially in children) as being attended with an enlargement of the lymph-follicles and creamy distension of the Lieberkühn tubules; and, next, as a reflex of constitutional disease (? supervening septicæmia, H. V. C.), the swelling of the solitary and Peyer's glands principally in the colon which occurs in typhous gastro-enteric fevers, in almost all the exanthemata, including erysipelas, in acute rheumatism and gout, in croup, in scrofulous adenitis, in acute hydrocephalus, markedly in common Asiatic cholera, and lastly in acute convulsions, trismus, and tetanus. "The villi are generally also much swollen, but we invariably find the mesenteric glands in a state of tumefaction" (*sic.* Engl. Trans.) There is a deposit here both in and around the follicles, but this follicular affection differs from that occurring in typhus in everything that characterises the latter, and especially in reference to the metamorphosis of the typhous follicle.....thus, according to general conditions, this affection is more or less acute and transitory, the deposit and follicular tissue and the mucous membrane in very rare cases fuse into a small, shallow ulcer, and a further polypoid development occasionally takes place. In his standard "Treatise on Continued Fevers" (3rd Ed., p. 630), Dr. Murchison enlarges somewhat on this subject (adding pyæmia to the above list), and states that the follicular enlargement which here occurs is always slight, does not pass through the successive stages observed in the lesions of enteric fever, very rarely produces ulceration, and is not attended by enlargement of the mesentric glands (*sic.*); adding that these are not the lesions of enteric fever in an early stage, for they are not found any more advanced when death does not occur until the twentieth or thirtieth day of the illness; moreover, they are only present in exceptional cases of the diseases in question, whereas the lesions described as belonging to enteric are never absent. Dr. Murchison then adds, "at the same time, the possibility must be borne in mind of enteric fever co-existing

with the diseases just mentioned;" disallowing, however, any inference "that the lesions of enteric fever may become a part of any other acute disease." These few quotations will serve to show that in dealing with the Septic infections as above defined, the older authors preferred to separate Typhoid and keep it apart; whilst one of the latest would associate it with the rest of the group. My own investigation furnishes the only cases in point which I have yet met with, and it leads me to concur with the modern view that Typhoid has several near analogues; one of which is herein independently, if not for the first time, illustrated from Indian experience.

Summary of Section A.—There are many distinct kinds of ileac ulcer-lesion; those I have considered may conveniently be grouped as follows :—

(*a*)	*The anæmic or atrophic*.....	Either simple or specific (malarial).
(*b*)	*The embolic*.....	Either mechanical (including peptic ulcers) or specific* (septic).
(*c*)	*The inflammatory*	Either simple irritative (from chill, unsuitable food, mineral poisons), or specific* (the choleraic, croupous, diphtheritic, dysenteric, *septic* proper, typhoid, tubercular; with syphilis, and leprosis).

It is seldom that a single pathological cause is in operation throughout an illness, originally due to any one of the above morbid agencies. A common feature of the groups marked,* is their implicating particularly the lymph-follicles of the intestinal mucosa. Groups (*b*)* and (*c*)* are those most concerned here, especially the latter, which displays the co-relationships of the lesion under review—*vide* italics in (*c*)* with the affections named alongside. It is likely that the septic lesion of the intestines can be diagnosed during life, and it is certain that its

essential cause might be learnt; and so a means of prevention, if not of cure, become available. The above demonstration may not, meantime, be without a certain real value, from its pathological and sanitary indications.

In conclusion, whilst I am aware that the term 'Septic' is here employed rather hypothetically; still I consider there is at present an advantage attending, almost a necessity for, the use of this or an equivalent designation. Septic affections are either toxæmias, or infections with lesions; the local 'remittent fever' seems to me due to a filth or septic poisoning, while 'typhoid' is a pythogenic infection; their occasional pathological meeting-ground, as it were, being an ileac Peyerian lesion, which is about as rarely present in remittents as it is rarely absent in typhoid. That such lesion is not always of precisely identical aspect, appears to me of somewhat subsidiary import from the point of view now taken.

B. Histology and Pathogenesis.

Introduction.—Evidence has been adduced in the Cases described under Part I., that the Peyerian lesion I am discussing is generally of more or less acute character, but may be comparatively chronic (No. 10). Again, it may exist alone (Nos. 1, 2 and 4): though oftenest seen in combination (incidentally as the other data show) with diverse Septic states, such as croupous and diphtheritic or gangrenous inflammations, or with pyæmia (see Nos. 3, 5 to 10). Whilst, therefore, having special anatomical characters, it may be said to display wide relations, capable of modifying to some extent its grosser features.

1. *General Anatomy and Histology of the Lesion.*—In all my specimens, and particularly those of most acute and pronounced aspect, there was present a manifest tendency to local hyperæmia, congestion and blood-stasis at or near to sites of ulcer; and it was often evident that the necroses and ulcerations were preceded by, and ensued upon, such localised stasis. Moreover, judging from the amount of denser opacity and the redder aspect on section, it was apparent that commonly, if not invari-

ably, the lesions were in direct connection with the more intense degrees of stasis. Whilst within affected areas generally, the larger blood vessels (not as elsewhere at simply congested areas of the Ileum) retained after soaking in preservative solutions their repleted condition; it was at special points either isolated or scattered along the edges and variously spotted on the ground of follicular patches, that I found the maximum of opacity and sanguineous tint in the sub-mucosa; and at the same time, either formed ulcers, or incipient acute atrophy or gangrene of the mucosa superjacent. As regards the larger ulcers and those placed opposite to the mesenteric border of the bowel, it is usually demonstrable that they pertain to "agminated" groups of lymph-follicles; because with due attention some unaffected follicles can be detected at a part of the ulcer-edge; and when the search fails, it is not unreasonable to infer that all the follicles have become destroyed, for some 'patches' are normally of but small dimensions and so easily effaceable. In such last case, the ulcer may be of irregular shape and not exactly median in site; and wanting therefore the guiding features of known Peyerian lesions, if viewed in disregard of the homogeneity around, a doubt of its follicular origin might possibly be indulged in. With reference to the small and irregularly placed ulcers which accompany the larger ones, it necessarily remains undetermined if they arise solely in connection with the "solitary" lymph-follicles; because, in adults, the widest variability attends the normal number and distribution of these solitary glands (see also Klein in Publ. Heath Rep., 1875, p 91); and, besides, during the process of ulceration all traces of their original existence must be destroyed. Nodular enlargement of the solitary glands, prior to their ulceration, was seldom manifest in my series—an exception being case No. 3—and even then not nearly so marked as in the specimen of "true typhoid" in a Native subject, with which comparison was made.

In considering if there be any anatomical reasons for the preferential selection of lesion-site now indicated, my attention was naturally directed on the one hand to the structure

of the lymph-follicles, and on the other hand to the arrangement of the blood-vessels around and beneath the glandular patches—the outer muscular coat and the serous investment of the bowel not being specially implicated. As regards the closed lymph-follicles, it was evident that they were not commonly, if ever, primarily affected; and never at any time did they seem more changed than was explicable as the result of irritation and inflammation, inevitable on the necrotic process taking place in and beneath the mucosa near. It, therefore, appeared more likely that the blood-vessels were the seat of earliest morbid alterations; the frequent attendant of ecchymosis being other evidence to the same effect; and the remarkably strict limitation of blood-stasis, hæmorrhage and necrosis, pointing to thrombosis or embolism as an essential feature of the lesion. According to current pathological doctrine it is chiefly vessels of a certain narrow calibre (the capillaries escaping), or of a certain mechanical arrangement—*e.g.*, arterial tortuosity and multiple division, and scanty, open-angled venous anastomoses—that are liable to blocking of this kind, under various general morbid conditions such as prevailed in my cases (see below). From this point of view, it seems worth noting the following normal disposition of the vessels concerned here, as one which might so predispose to embolism or thrombosis :—Thus, around and beneath the lymph-follicles small blood vessels are especially abundant, the venous radicles having comparatively few anastomoses and presenting right or open-angled junctions in the sub-mucosa: here also many small nutrient arteries after entry, bend round and turn back in order to reach the circular layer of the musculosa externa; and when passing through this coat, the efferent veins are less than usual protected from pressure. I also note that arteries and veins entering at the mesenteric border, part from each other at about one-third the circumference of the gut (at least in the rabbit); and that along the borders of Peyer's patches occurs a copious final sub-division of the larger vessels—and, briefly, I think it not irrational to apply such data as these (the authorities are in Stricker and Rind-

fleisch) in elucidation of the morbid phenomena under discussion.

Next, I observe that as compared with enteritic inflammations attributable to external influences, the general vascularity of the mucous membrane was, in most of my specimens, strikingly moderate, partial and defined, even in vicinity of the ulcers; these lesions being seldom seated upon an inflamed area, and not seldom on spots where no surrounding hyperæmia but rather pallor prevailed. Suppuration was absent, fibrinous or serous exudations rarely noticed, and there might be no excess of mucus accumulated upon the free surface near of the gut. Some of the diffuse scattered congested areas at times noted, might be due to compression of the ileum in the pelvic cavity; whilst others doubtless represented minor and less intense—probably incipient or fading—degrees of specific blood-stasis. As already mentioned, in rare cases a croupous or gangrenous enteritis co-existed with the Peyerian ulcers, and even a dysenteric encroachment above the i.-c. valve; without being structurally connected with them.

It is right to mention that the densely agminated lymph-follicles lining the *Appendix cæci vermiformis* (which was always inspected), were invariably found to be unaffected in aspect, whatever the condition of ileum or cœcum near; Brünner's glands in the duodenum were, when scrutinised, found practically unchanged. Mere pigmentation of the mucosa was not peculiar to these Cases.

Minuter histological changes.—Examination with single lens and low-combined powers—*vide* PLATE 3. In the typical Case No. 1 and others, the villi and L. tubules around the ulcers were distinct and essentially unchanged; excepting some hypertrophy and flattening of the former, and a dilated and stretched aspect of the openings of the latter. The pits or depressions seen on the P. 'patches' are sites of lymph-follicles, over-hung by the enlarged villi, and still presenting at bottom the 'coronet' of tubule-openings now somewhat expanded, but without any central bulging (rather a level or even depression) indicative of considerable enlarge-

ment or 'infarction' so-called of the closed follicles themselves. The contrast is remarkable with a sample of genuine Typhoid, in which the general turgescence, at a distance even, is far greater, the villi huger and rounder, the L. tubules hidden, and all the tissues immediately about the ulcer confused and opaque as if passing into a state of sphacelus. Yet still the marks of an original enlargement of the lymph-follicles were not here more apparent than in my own specimens, there being visible no bulging in the narrow pits representing their sites ; so that whatever changes they undergo, must be sub-superficial. And sections of the two series inter-compared, prove that the main difference between them consists in the vastly greater, more abrupt and widespread (extending over the whole of the P. patch and highest sometimes at its borders) infiltration or 'deposit' so-called in the mucous and sub-mucous tissues, which is present in the Typhoid specimen alone ; and which by its bulk, firmness, opacity and fixed attachment entirely accounts for the general features of the typhoid lesion. On the other hand, the lax, level or barely raised aspect of the P. patch in the Indian specimen, with its blood-stained sectional hue and a moderate elevation and opacity limited to the neighbourhood of the ulcer-margin, are fully explained by the scantiness or indeed comparative absence of such solid 'deposit' with its attendant pallor. Vertical sections of the larger ulcers show that loss of substance occurs chiefly in the sub-mucosa, reaching beyond Peyerian limit, their edges becoming undermined so as to bend inwards with the mucosa but little changed as far as the incurved tip ; there being however some induration beneath, and frequently a nodular thickening around the basal margin due to thickened remaining connective tissue : enlargement of follicles in the mucosa towards the Peyerian side, was not detectible with the aid of a lens. The outer muscular and serous coats of the bowel may be either thickened somewhat or thinned, according to the depth reached by the necrotic process.

Miscroscopic examination of stained sections with the higher powers, showed that the columnar epithelial investment of the

villi and level mucosa was, accidentally or not, usually absent; whilst that lining the Lieberkühn crypts might be present and unaltered, or merely detached in part. Around the ulcers was a plentiful small-cell infiltration of the mucosa, thickening and separating its elements, and generally densest just above its proper muscle-limits; an accumulation here, at a distance of $\frac{2}{10}$ in. from site of necrosis, might be large enough to represent an isolated lymph-follicle, and yet nearer occurred a succession or blending of such accumulations which then projected deeper into the sub-mucosa, and at intervals showed signs of central disintegration radiating or tending upward towards the free surface of the mucous membrane, without however causing a tumefaction upon the latter. The sub-mucous connective $\frac{2}{10}$ or $\frac{3}{10}$ in. outside the ulcer was unusually injected, and cell-groups appeared around the vessels: the outer muscular coats and the serosa having also many cells interspersed, with enlarged blood-vessels. A denser layer of leucocytes was usually visible just within the circular muscular layer. Vascular trunks were seen passing inwards between the muscular bundles, and comparatively large vessels (venous), might be traced as high as the mucosa proper. At the edge of the ulcers, the leucocytal infiltration became so dense as to distend and render opaque both mucous and connective tissues; the outer muscular bundles being thickened and separated, and the subserous connective double or trebled in depth without rupture of the serous membrane itself. The attendant enlarged veins were usually filled with red-discs, whilst the arteries seemed contracted and empty: capillaries were large and multiplied in aspect. So far as ascertained the free cells were identical with leucocytes, some of them being however enlarged and multinucleated. Adenoid tissue was evidently hyperplastic in the lymph-follicles here, whose limits finally became traceable only through the course of their investing blood and lymph-channels, and by an opacity somewhat denser than that of the adjacent infiltrated connective. In the stained sections, no bacteria were found; but in fresh sections, around the vessels at margin of an ulcer in Cases 1 and 4, I saw many delicate mi-

crococci in groups (staphylococci) both free and enclosed in lymph and epithelioid (?) cells: also within a plugged vessel at the base of a hæmorrhagic ulcer in Case No. 5, masses of cocci of seemingly rather larger size: further enquiry has yet to be made. Imbedded in the connective of ulcer-vessels in Case No. 4, I noticed numerous clear yellow or orange-tinted masses of somewhat resinoid aspect, and unaffected by acid or alkali; and similar globular masses were detected beneath some Peyer's patches in Cases 6 and 8. Drawings are preserved, with measurements, of all the above; as well as fresh mounted specimens, which however are apt to deteriorate here. (See PLATE 4 and description of the Figures in it.)

Direct comparison of sections and tissues being made with specimens from a case of genuine 'Typhoid,' the coarser differences found seemed to be those of degree rather than of kind: thus, in Typhoid there is a more copious and dense cell-infiltration and vascularity, which moreover implicate the entire area of the Peyer's patch, and are abruptly defined at its border, not passing beyond the true follicular area; whilst in the Septic lesion the morbid changes are far more limited, not at one time implicating a space larger than that occupied by a few follicles on a patch, and subsiding around this in a gradual manner. My impression was that at the Septic ulcer-focus the morbid process was at least as intense, and probably the more acute in advance; also that the follicular enlargement around the seat of ulceration, did not exceed the possible results of an irritation necessarily excited by the presence of such necrotic process.

Note.—At the J. J. Hospital, from May to October 1886, and in addition to 4 of the instances described in the Text, Part I, I have inspected 19 examples of Ileac lesion; of which 4 were tubercular, 3 pigmentary, 5 hæmorrhagic, and 7 with ulcers not altogether unlike those under review, and so far confirmative of the opinion expressed, that there is a tendency in Septic blood-disturbances to be localised in connection with the agminated and possibly with the solitary lymph-follicles. As, however, they may occur quite apart from Peyer's patches, it is likely that the blood-poisons were not in all alike. Details are kept, but are too lengthy to introduce here. There was an instance of fatal 'remittent' fever with lobular abscess of lung, and many marks of

hyperæmia in the ileum, the P. patches being sometimes atrophied. Also a case of intense intestinal irritation and depression, with symptoms of obstruction so pronounced as to have warranted the operation of laparotomy, without avail, there being no stricture to relieve; here I found wide scattered areas of acute enteritis, only sometimes Peyerian, and involving all the walls of the bowel, peritonitis having begun; this was most marked in the ileum towards its lower part, implicating less the jejunum; and in the duodenum there were seen only a few hæmorrhagic spots in the sub-mucosa chiefly, but over one of these I detected 2 small defined ulcers, ½ in. long and much like figure A in PLATE 1*; at another spot near the mucosa was evidently breaking down; no signs of lymph-follicles to be made out: the mucous membrane generally unchanged in aspect; history obscure, but the case apparently one of acute blood-poisoning. Since the above was written, I have met with the remarkable instance of Tubercular ileac-ulcer detailed above under sub-heading A; in which it appears that the acute tubercular infection itself may lead to the production of ulcers by no means unlike the Septic, or at least that it may concur with a pythogenic infection the same result following. The ordinary chronic tuberculosis of the ileum commonly presents other aspects; and these do not resemble that of the lesion in my Case No. 10, which was referred to a chronic Septic infection.

2. *Pathogenesis of the Lesions.*—In the absence of experimental proof, this may be estimated partly on anatomical and partly upon analogical data.

First, as to the *anatomical* evidence regarding the mode of origin of the ulcers, it was noted in my specimens that sub-mucous hyperæmia and extravasations at isolated spots were common, and might not be visible from outside (except by a darkish depression of the serosa) and but indistinct from within: occasionally the two outer coats of the bowel were the seat of ecchymoses (as in Case No. 5), but I did not see hæmorrhages in the mucosa itself or within the lymph-follicles, where the vascular calibres are narrowest. In Cases 5 and 7 the connection of the ulcers with such local vascular stasis and extravasations was unusually apparent; and as regards No. 7, besides the Fig. A in PLATE 1c., I have another drawing showing even more distinctly, the direct connection of a necrotic area with a gorged vessel running in the sub-mucosa across a Peyer's patch as far as the apex or seeming advance-point of the lesion. The attendant vascularity may, however, be less

striking : thus in Case No. 1 the earliest sign of lesion consisted of darkish, opaque, rather soft and depressed spots, with still unbroken mucosa and serosa, which occurred upon Peyerian areas otherwise little altered : and so in Case No. 2, see Figs. *b* 1 and *b* 2 in PLATE 1*a*. Case No. 3 displayed a lesion perhaps nearest of all in common aspect to Typhoid, and here at autopsy the ileac gland-patches in succession were reddish, tumid, softened, very moderately raised, and though often a little highest at their edge yet as a rule not very sharply defined : by transmitted light only moderately opaque, and still showing narrow red lines of repleted vessels around their constituent follicles and along margins of patch. Then bright red spots of incipient erosion $\frac{1}{8}$ in. long with narrow pinkish lines at the edge, were detected : lower down, some solitary glands were raised, red, softish and decidedly opaque ; and still lower Peyer's patches hardly more altered than above, all presented at scattered points on their surface necrotic lesions or ulcers which were small, transverse or oblique, seldom covered by a slough (not yellow-tinted) with sharpish punched-out contour ; and not appearing to constitute the final stage of a prior intermescence or distension of the follicles, so much as seeming to be a supervening or superadded event upon a local disturbance of nutrition. In Case 4 was the same feature of direct necrosis, not preceded by any signs of lymph gland-infarction—see PLATE 1, Fig. 2. In Case No. 5 were minute, elongated clefts or fissures with flaccid pink edges, depressed or funnel-shaped, and bearing the aspect of incipient scattered ulcers : the sub-mucous connective beneath soft, lax and more or less blood-stained, without trace of 'deposit' or around any thickening ; and microscopically such spots revealed a limited blood-stasis with reddish fluid and some leucocytes effused. At one turgid point, after the addition of potassa solution, there was seen a divided vessel so closely plugged with 'cocci' as to suggest the idea of these organisms being intimately connected with the derangement of circulation and nutrition near. I have made numerous sections of small and incipient mucous lesions, and in no instance have I found as an early feature any

neoplasm or 'deposit' in the mucosa alone, such as might be referred to a primary infarction of lymph-follicles ; on the contrary, the turgescence present was always accounted for by some expansion (translucent, soft and reddish) of the sub-mucous connective, the two outer coats of the bowel being blood-tinged or unaltered. No doubt leucocytes soon make their appearance outside the distended vessels, and may wander into the mucosa as well as elsewhere ; but it is only later that cell-infiltration becomes attended with an induration, imparting the features of so-called inflammation, and then necrosis will have already begun in the mucous membrane deprived of its blood-supply. The preceding details were derived from my acuter cases ; but, except in there being conjoined more signs of atrophy of the mucosa, they apply as well to such quasi-chronic examples as No. 10. As the larger ulcers seemed to be formed by extension of such small beginnings as are above described, it will not be necessary to add more than that here is obviously no evidence of any real 'stages' in progressive formation of the lesions ; and although the general aspect of individual specimens was by no means quite identical, still the differences noted appeared to me to be incidental rather than essential, and not greater than might be anticipated considering the varied general states with which the intestinal lesion was associated.

The inference to be drawn from these data, points to the lesion in question not being a gradual result of infarction of lymph-follicles, or a direct result of acute enteric inflammation, or a single consequence of pressure from over-distension of the sub-mucosa; but rather a form of quick molecular atrophy following upon effective interference with the blood-supply of the part, intensified possibly by local irritation from the presence of sepsis-products of the pathogenic organisms inducing the plugging vascular obstruction. And such inference is strengthened on viewing the progress and later aspects of the ulcers, which though not always strictly alike, yet seemed to me perfectly explicable as the consequence of embolism or thrombosis varying somewhat in extent, degree and irritative character. I have also suggested an anatomical reason for the pre-

ferential site of lesion usually manifested; and need hardly add that absolute uniformity or simplicity of events could not be looked for in a morbid phenomenon, which while defined enough is probably generic or at least inclusive of varieties.

My investigations do not yet enable me to discuss the manner in which local death takes place in the intestinal walls; but so far as they lead, the term employed above of 'acute molecular atrophy' seems to express such mode of disintegration, preferably to the term 'coagulative necrosis' which is employed in analogous lesions (Ziegler, *l. c.*, vol. I., p. 65). For in connection with the Septic ulcer, there is but scanty free-exudation; nor have the moderate inflammatory cell-aggregations around the ulcer, solidified into hyaline or granular masses incapable of taking up the staining-colours, as is said to occur in the Typhoid infiltration of Peyer's patches. Some peculiar hæmatogenous masses are, however, shown in PLATE 4, Fig. E.

Next as to *analogical evidence* regarding the nature of this Lesion; having already in Part I. submitted the argument for its identification as a Septic lesion somewhat similar to the Typhoid, it remains to consider more closely the ultimate relationship of these two forms of ileac disease, as follows. According to European authorities the typhoid ulcer (independently of the patient's symptoms) is liable to a wide variation of intensity, also to various anomalies of aspect (Rokitansky, *l. c.*, p. 75), and lastly to important histological differences: whence the not unlikely suggestion that these tropical Septic ulcers represent merely a minor intensity (*a*), or an anomalous (*b*), or some modified (*c*) form of ordinary Enteric. On this head, I note (*a*) that whilst the genuine typhoid lesion of typical aspect may undoubtedly occur in a Native subject (*vide* PLATE 2, Fig. 7), I have not yet met with an ulcer-form of aspect strictly intermediate between the two kinds under comparison; this circumstance indicating some fundamental difference between the two series: and again (*b*) of the anomalies of the typhoid process enumerated by Rokitansky, none have seemed to me fully applicable to the case in hand. With regard, however, to the remaining suggestion (*c*), it is worth while here alluding to

a certain want of conformity in such current descriptions of Typhoid as I have access to, because the tendency of some accounts is to approximate the beginnings, at least, of both Septic and Typhoid lesions : thus, as regards the Enteric I find one recent writer upholding what is probably the generally accepted view, viz., that this affection consists of an inflammatory swelling of the closed follicles and of the mucous membrane in their neighbourhood, the inflammation often going on to necrosis and sloughing—he having just previously remarked that it is very probable the specific poison of the disease finds entrance by the intestine and produces irritation of the follicles and mesenteric glands on its passage to the blood (Coats, *l. c.*, p. 623) : Professor Ziegler also writes of the disease as being attributed to the invasion of a specific bacillus, the intestinal changes consisting essentially of a necrotic inflammatory infiltration of the follicular structures and of the parts around them, accompanied by catarrhal inflammation of the rest of the mucous membrane (*l. c.*, p. 291, and see also Dr. Gaffky's views—Mitt. a. d. Könl. Gesund., 2nd Vol., 1884, p. 372) : whilst on the other hand Dr. J. Harley, mentioning the usual presence of very acute inflammation, asserts that the inflammatory products are formed around the closed follicles and not in their interior (*l. c.*, p. 363)—a statement certainly warranted in my opinion by ordinary inspection of the parts ; and there are, I may add, passages in Dr. Klein's description (*l.c.*, p.p. 100-102) showing that even if the earliest morbid alterations take place within the lymph-follicles (which is not expressly stated so far as I perceive), still the necrotic changes are attributable to a deposition, probably by exudation from the sub-follicular blood-vessels, of dark material in the inter-fascicular connective lymph-spaces, with a consequent breaking down of the corresponding parts which gradually extends to the neighbouring lymph-follicles. Adverting now to the Indian specimens, from my earliest scrutinies it was apparent that the first event consists of minute scattered blood-stases in the sub-mucosa, which were attended with cell-infiltration around and soon followed by a moderate diffused turgescence of the super-jacent

mucosa, whilst the parts deprived of their blood-supply speedily undergo a retrograde nutritive process without their being previously the seat of a special degree of hyperplasia: and hence it was I termed the ulcers resulting "non-typhoid," nor have I subsequently seen proof that the incipient hyperplasia of irritation appears either first or most within the lymph-follicles themselves. So the matter stands. I am aware that not too much stress should be put upon a short series of 'cases'; and also that now-a-days pathologists will differently estimate the force of minuter histological differences: yet still even a few data may be sufficiently valid, and moreover in the present instance the actual order of histological events must greatly influence our views of pathogenesis—thus, if it be true that the lymph-follicles are the place of entry of the poison, they would first of all show irritation-results (as is stated of Typhoid); whilst if they be not primarily implicated but only secondarily to a deeper-seated disturbing cause, their enlargement and destruction would be comparatively slight and limited (as in this Septic lesion); and, further, if the lesion apparently begin in the lymph-follicles it becomes referable to an extrinsic or extra-vascular origin, whilst if it commence within the vascular area it is probably due to intrinsic blood-contamination. According to my apprehension the clinical data above submitted best accord with the view of a blood-contamination, which has accrued late in the course of an illness, and so far is unlikely to have been a primary event or referable to poisoning through the *ingesta*; and I think that the anatomical data agree with this interpretation, of a quasi-septic infection supervening on a prior blood-disease. The Peyerian lesion is here shown not to be limited to one such blood-disease, nor as a local 'complication' did it always exist alone.

In Bombay, various forms of infective embolism are frequent as the probable cause of local complications, at advanced stages of severe 'Fevers'; they often occur in the lungs, not seldom in the abdominal organs, and occasionally in the brain, at sites doubtless in some way preferential. It is known that the blood-contaminations giving rise to such events are represent-

ed by organisms resembling some of the common 'bacteria of fermentation and putrefaction' ; and by experiment it is proved that sometimes—and upon occasion only or by incident as it were—such 'common' bacteria happen to contain in their midst one or more species possessing 'pathogenic' properties. In Europe that of the Typhoid infection now predominates, which induces a Peyerian lesion with attendant clinical symptoms ; but in tropical Bombay, where filth abounds, the pythogenic infection and lesion are both usually diverse, for autopsic evidence shows that a typhoid-like enteric lesion is extremely rare amongst Native Hospital patients, a large proportion of whom neverthless die of persistent Fever (complicated), and the same holds good of the sick of well-to-do people ; nor during life are marked abdominal symptoms by any means invariable—though this may be a contingent feature only of wide Peyerian lesion, as my first three cases demonstrate. Having upon clinical, therapeutical and analogical grounds being long led to regard the 'remittent' and 'continued' fevers (still so-termed) of this place, as not truly paludal (malarious), but rather as pythogenic (septic), the occurrence of melæna, peritonitis or perforation of the bowel as a complication (when not dysenteric) has hitherto been difficult to account for, except on the hypothesis of a 'Typhoid' attack (see for instance an outbreak of fever described in Vol. 2 of these Transactions 1883) ; but the later experience herein recorded, seems to offer a sufficient explanation of such febrile events, which if somewhat rare are yet very serious ; and it seems to me not unreasonable to infer that the 'septic' Peyerian lesion above described, may then be present as a clinically latent complication oftener than is supposed. The renewed attention of resident clinicians to later abdominal symptoms of prolonged fever-cases, and of our pathologists to all morbid changes detectible in the ileum, may therefore fairly be invited ; in order that the knowledge of Indian 'remittents' may become more definite, and so a problem in Medicine committed (as it were) to us here, be at last satisfactorily solved.

APPENDIX.

Historical and Co-temporary Retrospect.

Whilst it cannot be supposed that the particular form of ulcer under notice has remained hitherto unknown, yet after some research I am unable to find a full description of it; and therefore imagine that earlier instances were attributed to Typhoid or Tubercle, or if inconspicuous were overlooked, or thought worthy of only a brief allusion. May be, too, this lesion is somewhat rare.

As regards European experience, the standard pathological manuals of Rokitansky (Syd. Soc. Trans. v. 2, 1849), Jones and Sieveking (1854), Wilks and Moxon (1875), Coats (1883), Cornil and Ranvier (1884), and Ziegler (1884) do not discriminate such a Peyerian lesion: nor is any allusion to the same made in the excellent articles on Intestinal ulcers by Drs. Bristowe (in Reynolds', v. III.) and Leube (in Ziemssen, v. VII.). Nevertheless, I am of opinion that in monographs or special articles inaccessible to me here, there will be found proof of this lesion being ere now more or less clearly recognised.

It is noteworthy that in current treatises on Malarial Remittent Fever, no reference is made to intestinal ulcerations of the kind in question, even as an exceptional phenomenon. (See Drs. Hertz in Ziemssen, v. II. and Maclean in Reynolds' and Quain's epitomes).

Nor as regards the older Indian experience proper, has my search for priority elsewhere been more fruitful. There are, indeed, to be found in authors several general allusions to the occurrence of intestinal ulcers, in what was termed 'remittent' fever; and besides, there are some records of individual cases presenting an example of such particular conjunction: but a reference to the original articles, has hitherto not afforded to me the material adequate for a sufficient discrimination of such instances, from other kinds of fever and lesion they might obviously have been confounded with. And as matter of fact, before the date (*circa* 1853), when the true Typhoid fever with one lesion became clearly differentiated, observers in India could

hardly be expected to distinguish minutely enough for specific elaboration, the varied forms that exist of ulceration in the small intestine; and hence an almost inevitable vagueness of statement in the original reports (*e. g.*) of Annesley, Twining and even Morehead (1856). Dr. Goodeve, also, in his clinical lecture on Typhoid Fever (Ind. Ann., January, 1859,) whilst stating (*inter alia*) that he had 'seen cases of *post-mortem* examinations in which ulcerations of Peyer's patches were observed after death from simple remittent fever,' does not furnish any autopsic evidence; and it seems, therefore, open to question what other character such cases might have had, of remitting pyrexia and concurrent intestinal lesion. Dr. Morehead's later view (Work, 2nd ed., produced in 1860, after retirement of the author from India), was 'that disease of Peyer's glands either in the stage of turgescence or ulceration is not peculiar to typhoid only; for it occurs in cholera, in protracted diarrhœa and in acute muco-enteritis; or as an occasional complication of remittent fever, and it is a frequent one of phthisis pulmonalis.' To such a statement as this, none will demur; though, evidently, hereby no aid is afforded towards the discrimination now needed, of the several Peyerian lesions named in it, as well as of others (*e. g.* the Septic) which have been more recently brought to notice. In the course of my brief enquiries into the past, nothing would have pleased me more than to meet with a full, consistent and clear description of any intestinal lesion that might have been subject of debate; yet such descriptions must be rare, as they were not found substituting the usual brief and incomplete summary which once appeared to suffice.

Another interesting record of autopsic experience at the large Native General Hospital of Bombay, a quarter of a century since, was contributed by Principal Dr. J. Peet (Trans. Med. Phys. Soc. of Bombay, 1862, p. 220), who states that at 200 autopsies made during 1850-60, the ileum was entered as free from disease in 120; in 50 cases its condition was not mentioned but presumably was healthy, and in the remaining 30 it was diseased as follows:—Peyer's glands ulcerated in 14, prominent in 5, gra-

nular exudation on mucous membrane in 7, and redness of mucous membrane in 4 cases. The ulceration of Peyer's glands was tubercular in 13 cases; and once 'the intestines were distended, their mucous membrane reddened, and two or three patches of Peyer's glands at the lower part of the ileum were ulcerated'; the upper lobe of the left lung being in a state of grey hepatisation, and the kidneys enlarged especially at their cortex,—no particular diagnosis of this example being offered by the author. The granular exudation was found in dysentery; the prominence of the glands without ulceration, and the redness of the mucous membrane were present in bronchitis, phthisis and remittent fever. Dr. Peet also gives the result of 111 autopsies made in 1861; Peyer's glands being found diseased 16 times, as follows:—unusually injected 1, unusually prominent 1, ditto and red 1, ulcerated 5 times (phthisis) and 2 (dysentery); 6 times ulcerated in doubtful cases, of which 1 had tubercles in the lungs, 1 was cholera with a large single ulcer in the lower part of the ileum, 1 was chronic diarrhœa with ulcers of Peyer's glands and some disease of the large intestines, probably scrofulous; and 2 cases with ulcers in the ileum varying in size and number, and no lesion elsewhere detected; these last 'may have been examples of typhoid, and this, perhaps, is as much as can be said.' There is no need for comment here; yet it is fact that several years before the earliest of the above dates, Rokitansky had accurately and even elaborately pictured the true 'typhous' ulcer, in its many varieties; at the same time furnishing the means of its discrimination under such forms, and adding (*l. c.*, p. 75), 'that an acquaintance with the many anomalies of the typhous process is of such importance that we would not trust the person ignorant of them to judge of the *post-mortem* examination in a case of acute fever.' And now, as previously, it may be said that for the sake of accuracy, both knowledge and experience must be acquired by the observer; for otherwise progress in this branch of medicine can hardly be anticipated, and the risk of perpetuating error will remain. It seems to me highly probable that ulcer-lesions of the kind under review were long since seen in Bombay, but I

am unable to affirm such opinion from the want of adequate data of judgment. Notwithstanding the above and other statements regarding the occurrence of ileac ulcers in 'remittent' fever, it appears remarkable that no allusion was ever made to hæmorrhage from the bowel, peritonitis, or perforation, as a complication of such lesion (see also Dr. N. Chever's remarks in *Med. T. and Gaz.*, 1882, vol. 2, p. 747, London); possibly there are some exceptional instances amongst the Museum series named below.

A collateral question of interest here, concerns the peculiar lesions which have been described in connection with the so-called 'typho-malarial fever,' for at one time opinions differed where uniformity might have been looked for; thus in late American experience, some observers (Drs. Röderer and Wagler ?) as quoted by Sir J. Fayrer in his Croonian Lectures, 1882) did not find more than a pigmentation of Peyer's glands near to the ileo-cæcal valve; whilst others later (Mr. C. Mayo as quoted by Dr. J. Harley in Reynolds, vol. 1, 1870), maintained that when the typhoid symptoms predominated, at the autopsy lesions of Peyer's glands were present. In the text above, Part II., I have discussed this subject at some length*; it now seems to be settled in a manner which strongly suggests that, on a large scale, veritable typhoid lesions are apt to display so much variability of aspect as occasionally to give rise to doubts of their true character; and, so far as I am able to judge, a similar uncertainty prevails sometimes as regards the corresponding 'Fievre paludienne typhoide' of French physicians and the 'Tifo malarico' of the Italians; see Fayrer, *l. c.* p. 186, &c., but without ampler details than are accessible, I cannot feel sure that ileac lesions similar to those described in this Essay,

* As these sheets were passing through the Press, I received by the kindness of Dr. John E. Billings, Director of the Army Medical Museum, Washington, some excellent photographs and chromo-lithographs of the intestinal lesions in 'Typho-malarial' Fever, which confirm the view of their identity with the lesions found in genuine 'Typhoid' fever. These illustrations will, I am informed, appear in the next volume of the Medical History of the American War; they were exhibited at the December Meeting of the Bombay Medical and Physical Society, and were much admired by the members present.

have or have not been seen elsewhere and at times been regarded as of ordinary typhoid nature. The clinical and etiological aspects of this subject, remain at least equally undecided.

Regarding the mixed-fever of stations in the Mediterranean, Egypt, the West Indies and at the Cape, so frequently alluded to in reports of the Army Medical Department, all I need here state is that nowhere have I found the description of a lesion identical with that under review. (There are some details of interest in Surgeon-Major F. H. Welch's Alexandra Prize Essay, 1883, on Enteric Fever in the British Army.)

As regards more recent Indian records, I would note first the significant remark of Dr. Wall, late of Calcutta (quoted in Fayrer, *l. c.*, p. 175), that in some cases of fever nearest resembling the remittent, there may be found an intestinal ulceration 'distinctly not typhoid, being irregular and by no means selecting the site of Peyer's patches and very often encircling the bowel.' More particularly, Dr. G. F. A. Harris has described (Ind. Med. Gaz., August, 1884), the case of a young European recently arrived in Calcutta, who died after 20 days' persistent fever without any symptoms of enteritis; at the autopsy there being found 'no disease anywhere except in the jejunum about its middle, where were numerous superficial ulcers or erosions sometimes transverse and blood-stained, with clean margins overhanging and not thickened; these ulcers were not in the least like typhoid ulcers, nor were they tubercular;' the corresponding mesenteric glands were not enlarged, and the ileum was healthy. The precise dimensions of these lesions is not given, nor is allusion made to their connection (if any) with the lymph-follicles of the intestine; and hence it remains with me uncertain, if they be identical with the 'Septic' ulcer under discussion. As this last remark applies also to the 'perforating' ulcers shortly to be mentioned, I will only add that according to my experience the remains of a Peyer's patch may be both scanty and indistinct, and not to be detected without the aid of a lens, the portion of the bowel also being submerged in a clear medium, gently brushed over, and somewhat stretched out: of course the site of the ulcer, as regards periphery of gut,

would be some guide, and that independently of its shape: see the Text, Part II., sub-section B. Cases like those just referred to, or similar to my own, are probably rare at Calcutta; to judge from an interesting statement of Dr. Waddell (Ind. Med. Gazette, June, 1884) that in 20 late autopsies of remittent and continued fever made at the General Hospital (for both Native and European patients), in only very few instances were there any lesions of the solitary and agminate glands of the small intestine; these lesions with one exception (*viz.*, of typical Typhoid) being slight swelling and infiltration of the solitary glands and of Peyer's patches. As regards Bombay, experience is probably not dissimilar here: thus, apart from the proved occurrence of Typhoid at the military hospitals (European), and at the European General Hospital, where also it is occasionally seen, the records of the large Native Hospitals continue to display a noteworthy rarity of enteric lesion as a feature of the continued and remittent fevers, so-called, which prevail amongst the poorer indigenous classes. I have already quoted some records of years gone by, and passing over a short interval, unavoidably blank, may fitly allude to the data for 1876-78 contained in my work on Spirillum Fever, 1882, pp. 438-40, where it is stated that of 74 autopsies of native patients dying 'from remittent fever' during 1877-78, intestinal lesions like those of Typhoid were found four times, or in the ratio of 5·4 per cent: the details are also given, and now upon review of my past experience, I think it likely that 3 or 4 of the 5 examples there described may have been illustrations of the 'Septic' lesion discriminated in the Text above: confessedly, however, my notes are too brief and imperfect to be adduced in evidence, and the museum-preparations cannot be surely identified. It would be one benefit arising from the present Essay, if in future more pains were taken in describing the ileac Peyerian lesions of 'fever' cases and of other acute infectious diseases; and this remark applies also to the cases of Europeans as well as Natives, because it now appears that 'Septic' Peyerian ulcers occur in both races. Coming down to later dates, there is the interesting observation of Surgeon-

Major G. Waters, that at the J. J. Hospital, Bombay, during 1882, in 15 *post-mortem* examinations of cases of remittent fever, no Peyerian lesions like that of typhoid fever were seen. In only one case was there 'any enteric lesion as a morbid attendant of remittent fever, and this consisted of an abrasion of the mucous membrane of the ascending colon; the erosion being but slight and covered by a shreddy form of slough.' In a total of 165 autopsies, there were noted in the stomach ulcers 2, the duodenum showed no specific lesion, the jejunum was frequently the seat of tubercular deposit and still oftener the ileum, and it was worthy of notice that in some instances of tubercular deposit here the Peyerian glands escaped implication. (Trans. of Med. and Phys. Soc., Bombay, 1883.) Surgeon R. Manser has very kindly furnished me with a statement of his last records at the same hospital, as follows :—Total autopsies in 1883-4-5, respectively amounted to 128, 103, 122; of which 'remittent fever' cases 10, 8, 8, or a total of 26, and in none any marked Peyerian ulceration found. Both of these data therefore coincide, in general terms, with those of the same Hospital noted 25 to 35 years ago ; and this observation is not without its great significance. At the Gokuldas Tejpal Hospital, during a recent period of 18 months, I saw and made 81 autopsies, of which 28 were on account of 'remittent fever'; and these have furnished 6 of the instances of 'septic' ulcer detailed in the text: 3 of the remainder being seen by me at the Jamsetjee Jejeebhoy Hospital within the past 5 months, and 1 coming from a country district of the interior: not one example of genuine typhoid seen. It thus appears that at the two large Native Hospitals of Bombay, during late years, in 143 autopsies of 'remittent' fever cases, there has not been seen a single instance of gross enteric lesion strictly comparable to that of genuine 'typhoid' ; and that in remittents very little palpable change may be detected, even when especial attention is paid to the state of the ileac lymph-glands, I know from personal observation of a few instances to be afterwards recorded. Still it happens that in some cases seen by me, the 'septic' lesion under review has come to light; the proportion of

these to total instances being probably larger than might be anticipated, because at an ordinary autopsy obscure or non-prominent lesion of the intestinal mucosa may be disregarded, misinterpreted, or overlooked. It may be observed that I have carefully abstained from suggesting that the 'septic' lesion at Bombay takes the place of 'typhoid' in Europe. The question, however, how far amongst British troops in India or other European immigrants, veritable 'enteric' preserves all the characters it offers commonly at home, is one which in my opinion yet remains to be answered with adequate precision. When 'true' typhoid or enteric occurs in a Native subject, it may present all the ordinary features of the English species; this I know from direct observation of an instance: but I have also learnt that a lesion regarded as one of 'characteristic' enteric in a Native, may really more resemble the septic variety; and this fact makes it worth enquiring, if enteric amongst Europeans in the East be always of the ordinary home aspect.

The next source of information employed has been Museum-specimens at the chief Medical Colleges of India; and here I am greatly indebted for Catalogues and other information, to the kindness of Drs. Keess, Burton Brown, McConnell, and Manser.

In Dr. J. F. P. McConnell's excellent Catalogue of the Pathological Museum at Calcutta, 1881, are the following entries extracted entire as being all more or less relevant :—

No. 74. Jejunum. From a case of continued fever: the valvulæ conniventes were turgid and swollen, and the mucous membrane is ulcerated in several places (Ewart).

No. 75. Chronic follicular ulceration of the small intestine. Portions of the jejunum and ileum were only affected: the ulcers in both are similar; they are broad, stretched right across the bowel, have ragged and thinned edges, and slightly roughened or irregularly thickened bases. There is no induration or caseation as in in tubercular ulcers. In the upper part of the ileum an ulcer has penetrated as deeply as the peritoneal coat, leading to perforation and death. During life the intestinal lesion was not suspected, the patient, a European male, æt. 25, was admitted suffering from hæmorrhoids: he was operated on, and had apparently recovered: he was constipated and dyspeptic while under observation, and occasionally referred to a pain at the epigastrium: no acute symptoms until the fatal peritonitis set in.

No. 77. Jejunum, with large transversely placed indolent-looking ulcers, apparently chronic in character and partly cicatrised. From an East Indian female. The ulcers stretched right across the gut, and are 1—2 inches in length : their margins are somewhat abrupt, their bases irregularly thickened, but not from any tubular deposit. (Chronic follicular enteritis.)

No. 144. Perforating ulcer of the Duodenum. (Doubtless of peptic character.—H. V. C.)

No. 145. Lower end of the Jejunum. At the upper end of the preparation is seen a transversely placed cicatrix, the result apparently of the healing of an old ulcer ; lower down there is a complete perforation through all the coats with much lymph outside, the hole is as large as a crow-quill. Patient a native, male, æt. 30 ; death from acute peritonitis.

No. 146. Lower end of Jejunum—shows two transversely placed broad ulcers with much contraction of the bowel at their sites, with perforations of the same through the open ulcers, one being sufficiently large to admit a pencil through which fœcal extravasation took place followed by death....The ulcers seemed secondary to the cicatrisal contraction, and were probably tubercular. Patient native, male, æt. 40, admitted moribund, with signs of peritonitis.

No. 147. Portion of ileum showing a large perforation involving nearly the whole of the transverse portion of the gut, and apparently occupying the site of an old ulcer : much lymph outside....Patient a native female, æt. 27, who had been suffering for a long time from diarrhœa, and who died suddenly with symptoms of peritonitis. There was also a similar perforation of the large intestine.....

No. 150. Lower end of ileum showing two perforations in connection with lumbrici ; death from peritonitis.

As in the above entries, there is no mention of Peyer's patches or the solitary lymph-follicles being the site of the ulcers, it might be presumed that these interesting specimens are not precisely identical with my own ; though to make this point certain, more information is needed. The spread transversely of an intestinal ulcer is a feature of all long-standing ulcerations of the bowel. (Wilks and Moxon, *l. c.*, p. 413.)

In the Madras Catalogue (1880) there is mention of a preparation (*No.* 28) of the small intestine with hypertrophy of Peyer's glands, some of which are ulcerated : death from diarrhœa of a few months' standing. One of the Ileum shows a perforating ulcer ; the patient was liable to constipation (*No.* 34). No. 40—Ileum showing a perforating ulcer which had caused fatal peritonitis. There is besides a series of pre-

parations showing a thinning of the coats of the small intestines with patches of ulceration, ecchymosis or suppuration, taken from subjects of senility or privation. No allusion is made to actual site of these ulcers, as regards the lymph-follicles of the parts concerned.

In the Pathological Museum at Lahore, No. 9, is a specimen of perforating ulcer high up in the small intestine, the ulcers being (as I learn by the kindness of Principal B. Brown) about the size of peas, excavated and circular; without any enlargement of solitary glands or Peyer's patches.

At the Grant College, Bombay, I have specially examined the collection of morbid specimens, making my own notes and comparing them often together.

E. 33 is an excellent example of the perforating ulcer of the Duodenum, commonly attributed, like that of the stomach, to corroding action of the gastric juice.

E. 22. Portion of the ileum from a boy who died of Typhoid fever : there was diarrhœa previous to death. (Catalogue entry.) I find the Peyerian patches slightly thickened and honeycombed on their surface by erosions or minute ulcers : walls of the gut very thin and morbid appearances not easily recognised now as being of genuine typhoid character. They rather correspond to an atrophic form of ulceration. (H. V. C.)

E. 78, also shows a limited punctate erosion of a Peyer's patch, not attended with thickening : no history.

E. 23 shows Peyerian patches and the Solitary glands markedly hyperæmic, yet scarcely raised. There is the aspect of a croupous-like exudation upon them, which also extends on the rims of some adjoining valvula conniventes : in some places the surface of the patches present small round cavities ; and in the centre of one patch is a distinct pale sloughy area, with whitish dots around as if of altered lymph-follicles. By transmitted light an evident opacity in the affected parts : walls of bowel generally seem thinned. No history here, but it is my impression the patient was one of those whose cases are reported as 'Typhoid' (perhaps modified) in "Spirillum Fever," p. 439.

E. 105 shows surface-necrosis at one of four places in the last four feet of the ileum. Apparently this change was connected with Peyerian areas though spreading beyond them. There are no signs of thickening. At one spot all the coats of the bowel are thinned as if perforation were imminent, the exposed sub-mucosa being of pallid hue. The patient was an aged female whose aorta was atheromatous and 'thromboid,' the lower part of the ileum and the caput cæci were deeply conjested on their free mucous surface,

especially on the rugæ and around the Peyer's patches (catalogue entry): she was admitted in a dying state, having it was said long suffered from fever and diarrhœa.

The above specimens presenting some peculiar features being disposed of, I next mention those more nearly resembling the series under review, and therefore indicating that the like have been already noticed, at least in a cursory manner. The following are well worthy of attention :—

E. 26. 'A clean cut perforation of the Ileum' with no thickening around; death from peritonitis. The ulcer is elliptical, transverse, $\frac{3}{4}$ in. by $\frac{1}{4}$ in.; and situated at one side of a Peyer's patch, the remaining follicles of which are but little changed so far as visible. (H. V. C.)

E. 45. A similar specimen also with a history of perforation, fœcal extravasation and death from acute peritonitis. About a foot, it is said, from the ileo-cæcal valve there were congested spots on the valvula conniventes. One larger ulcer, $1\frac{1}{2}$ in. by $\frac{1}{3}$ in. is transversely placed; edges inverted, not thickened; the base level, presenting an oblique perforation with blunt margin: this ulcer seems to have been situated at one end of a Peyerian patch, the remaining follicles of which are now very indistinct: there is another similar ulcer with perforation, at the mesenteric margin: the corresponding lymphatic glands much enlarged.—H. V. C. No history obtainable, the patient being admitted only two hours before death; diagnosis of the Assistant Surgeon in charge was 'Typho-malarial Fever.'

E. 54. An example of ileac ulcers, irregular in contour, transverse in direction, with jagged edges and level bases, sometimes with thickening around: median in position, and sometimes, at least, apparently connected with Peyerian areas, the remains of which are not specially altered—H.V.C.

History—Patient a Hindoo, male, æt. 30, contracted persistent fever in Central India, and after about a month became affected with diarrhœa, hence the diagnosis here as 'sub-acute enteric catarrh,' a complication or sequel of 'malarious fever': the man was seen only at latter period of illness (June 1881), and died 9 days after admission into hospital seemingly exhausted: stools frequent, liquid, tinged with blood and mucus: only slight febrile perturbations shown in the chart: astrigents failed to check the diarrhœa; there was some umbilical pain, and the sole of one foot became inflamed. At the autopsy, about 20 small ulcers were found at the end of the duodedum and upper part of ileum, $\frac{1}{4}$—$\frac{1}{2}$ in. long, transverse in direction, some being superficial, others deep with thickened margin and hyperæmic bases; deeply congestive patches were found below, and some so dark as to suggest the idea of hæmorrhagic infarct; there were also ulcers in the large intestine towards its end; (summary of clinical records, in which though no allusion is made to Peyer's patches, the mesenteric glands, spleen, lungs, &c.

the data still are such as to warrant the inference that this interesting case was essentially alike to the series in hand.) In the spirit preparation the lesions have a somewhat 'tubercular' aspect, yet I feel sure the presence of tubercle, had it existed, would have been noted; and besides, the concurrent sub-mucous hæmorrhagic extravasation is not a feature of tuberculosis; moreover, the lymph-follicles, so far as I can now see, were not specially implicated, nor was the lesion greatest lower down in the ileum.

E. 75. Ulcers in the Ileum from a case of 'Typho-remittent' fever: no history. I find walls of gut thinned, streaked with vessels: Peyer's patches distinct, their surfaces and edges being a little raised, yet no very clear signs of 'deposit': superficies of patches partly eroded; seldom deeply. At one spot, seemingly not Peyerian, there is an angular ulcer $\frac{1}{3}$ in. across, with defined edges and level base in the sub-mucosa: at the ileo-cæcal valve is a larger eroded area, over the site of a Peyer's patch; also many small isolated ulcers, rather jagged, not raised. Some solitary glands are indicated, and a small Peyerian area depressed rather than elevated. It appears likely that some infiltration exists in parts ulcerated, and the corresponding mesenteric glands are enlarged; as compared with other spirit preparations of genuine 'typhoid' and 'tubercle,' the intestinal lesion here is not prominent, and this feature is not unusual in the 'septic' lesion as now defined by me.—H. V. C.

Samples from the Cases described in the Memoir are also preserved.

DESCRIPTION OF THE ILLUSTRATIONS.

The figures in the first eight PLATES were drawn in pencil of the natural size from the specimens direct, and then copied on the stone as faithfully as possible. The specimens are kept in a preservative solution, which somewhat blanches and corrugates them; but the relation of parts is not much disturbed thereby, and some structures are rendered rather clearer than in the fresh state. Owing to varying dates of acquisition, the numbering of the Plates had unavoidably to be intercalated.

Note.—In all drawings the area of Peyer's patches is represented by a pitted appearance, contrasting with the smoother mucous membrane around.

PLATE I.

Figure 1.—From lower end of Ileum, showing a Peyer's patch with a transversely elongated ulcer upon its surface and encroaching on the adjoining mucous membrane. Dimensions of the ulcer $\frac{1}{2}$ in. by $\frac{4}{10}$ in., its edges defined, free and but little turgid; its base nearly level, but somewhat raised and darker at the side towards the follicular area: remainder of the patch and the mucous membrane near hardly changed in aspect, and no considerable enlargement of the solitary glands to be seen. From Case No. 1; see also PLATES 1*, and 3 and 4. (Tissues rather more shrunken than usual.)

Figure 2.—From lower part of Ileum, showing a Peyer's patch with 3 small ulcers at its sides and end, encroaching also upon the mucous membrane adjacent. They measure $\frac{3}{20}$ to $\frac{4}{10}$ in. long, are elongated, angular and obliquely or transversely directed, having well-defined margins and level bases; remainder of the patch but little altered. There is also a smaller funnel-shaped ulcer below, in connection with a minor follicle-group; and around, 4 other minuter necrotic spots measuring $\frac{1}{8}$ to $\frac{3}{10}$ in., which may have pertained to solitary lymph-follicles; primarily enlarged solitary glands not visible here. From Case No 4; for section of ulcer, see also PLATE 3.

Figure 3.—From the Ileum towards its end, showing a Peyer's patch with a narrow vertically-elongated ulcer on its surface; of dimensions $\frac{6}{10}$ in. by $\frac{2}{10}$ in., with edges tumid and puckered, and the base level with a jagged fissure in it; remainder of the patch not diseased, and solitary lymph-follicles not seen. From Case No. 5; and for section of another ulcer, see PLATE 3.

Figure 4.—From near junction of Jejunum and Ileum, showing a Peyer's patch with a narrow angular and longitudinal ulcer on its surface; measuring $\frac{7}{10}$ in. by $\frac{1}{4}$ in., with edges tumid and puckered, and the base level and somewhat nodulated: remainder of patch not diseased, and solitary glands not apparent. From Case No 6. The similarity of this intestinal lesion in Cases 5 and 6, whose history and general symptoms were alike, is remarkable; although some concomitant lesions were not quite the same, in either intensity or extent.

NON-TYPHOID PEYERIAN ULCERS—DR. CARTER'S SPECIMENS.

FIG. 1.

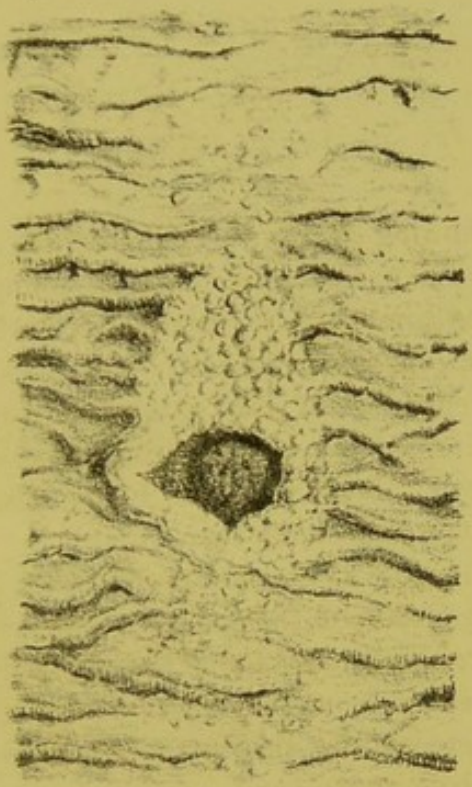


FIG. 2.

FIG. 3.

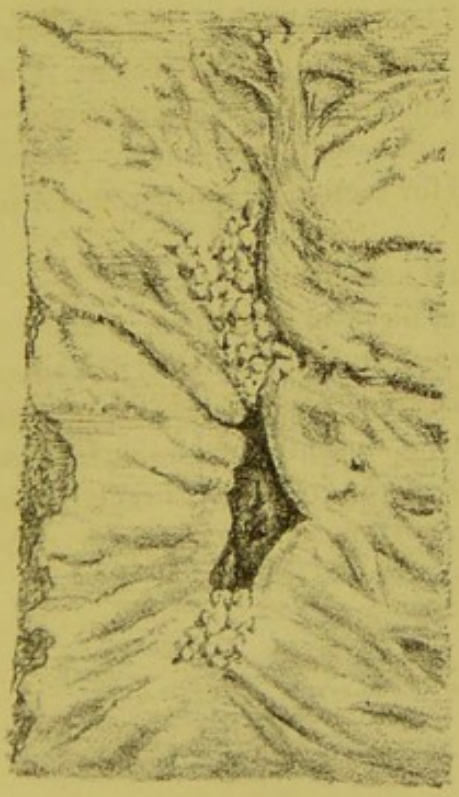
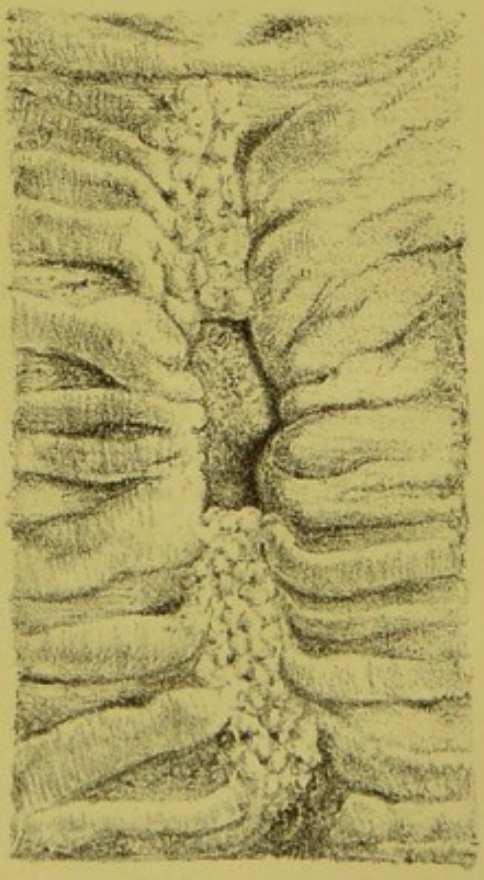


FIG. 4.



G. T. HO., BOMBAY, FEB. 1886, H.V.C. DEL. AD NAT.

PLATE 1*.

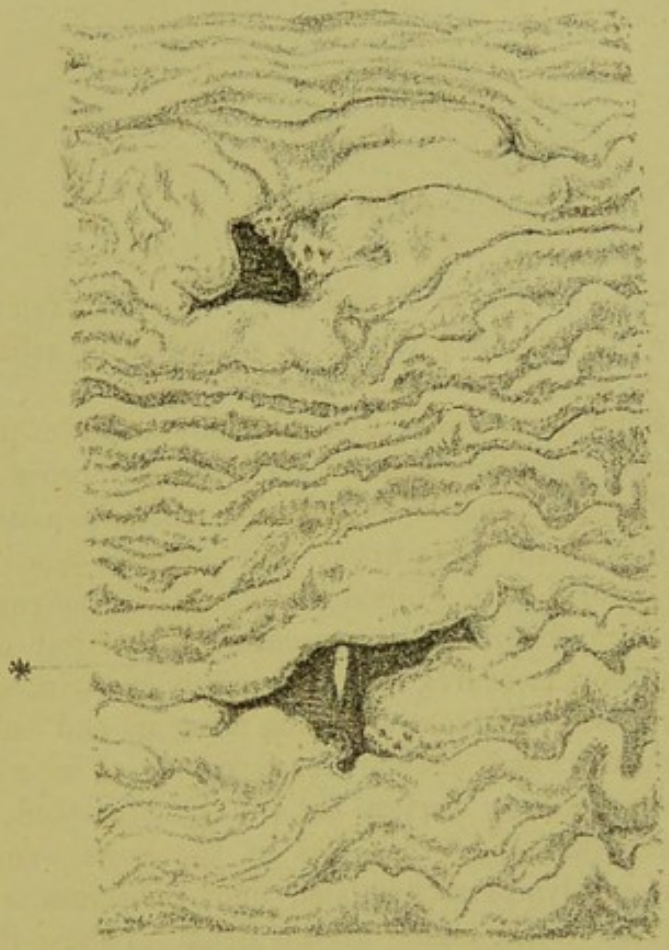
Other Peyerian ulcers from Case No. 1, less shrunken than that figured in PLATE 1, which had been placed in a solution of salicylic acid, whilst these were preserved in carbolic acid water-solution.

Figure A.—From lower end of Ileum, to show a spot of perforation of the coats of the bowel. Both the small ulcers displayed prove really Peyerian when closely inspected, there being distinct follicle-remnants to be seen at one side of each of them. The upper spot measures $\frac{4}{10}$ in. by $\frac{5}{10}$ in. and is of irregular rayed form, having tumid edges, overhanging considerably; and the base level, with inner circular muscular coat of gut clearly exposed. The spot $1\frac{1}{4}$ in. below measures 1 in. transversely by $\frac{4}{10}$ in. across, is equally irregular in form, with tumid overlapping margins, and base exposing the sub-mucous connective and circular muscular layer, in which under the upper edge is seen a narrow vertical slit $\frac{1}{8}$ in. long (marked at margin by*) passing completely through all the coats of the bowel, and in the fresh state blocked by soft lymph accumulated upon the serosa around it.

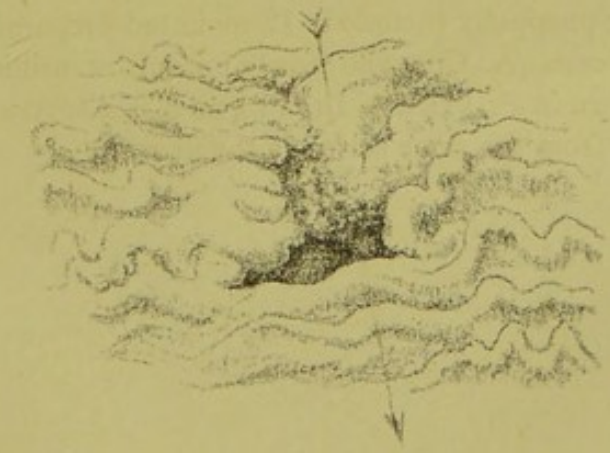
Figure B.—From rather higher up the Ileum, to show the aspect of a small typical transverse ulcer ($\frac{4}{10}$ in. by $\frac{3}{20}$ in.) distinctly Peyerian in site, which was selected for hardening, section, and staining for microscopic examination. The arrow indicates line of section, a nodule on the base of the ulcer being purposely included: 12 mounted preparations were made in London (by Messrs. A. Cole and Son) and duly scrutinised in Bombay with the results shown in PLATE 4. In PLATE 3 is a vertical section of a non-Peyerian ulcer from the same series as the above.

PEYERIAN ULCERS—*Case No.* 1.

A



B

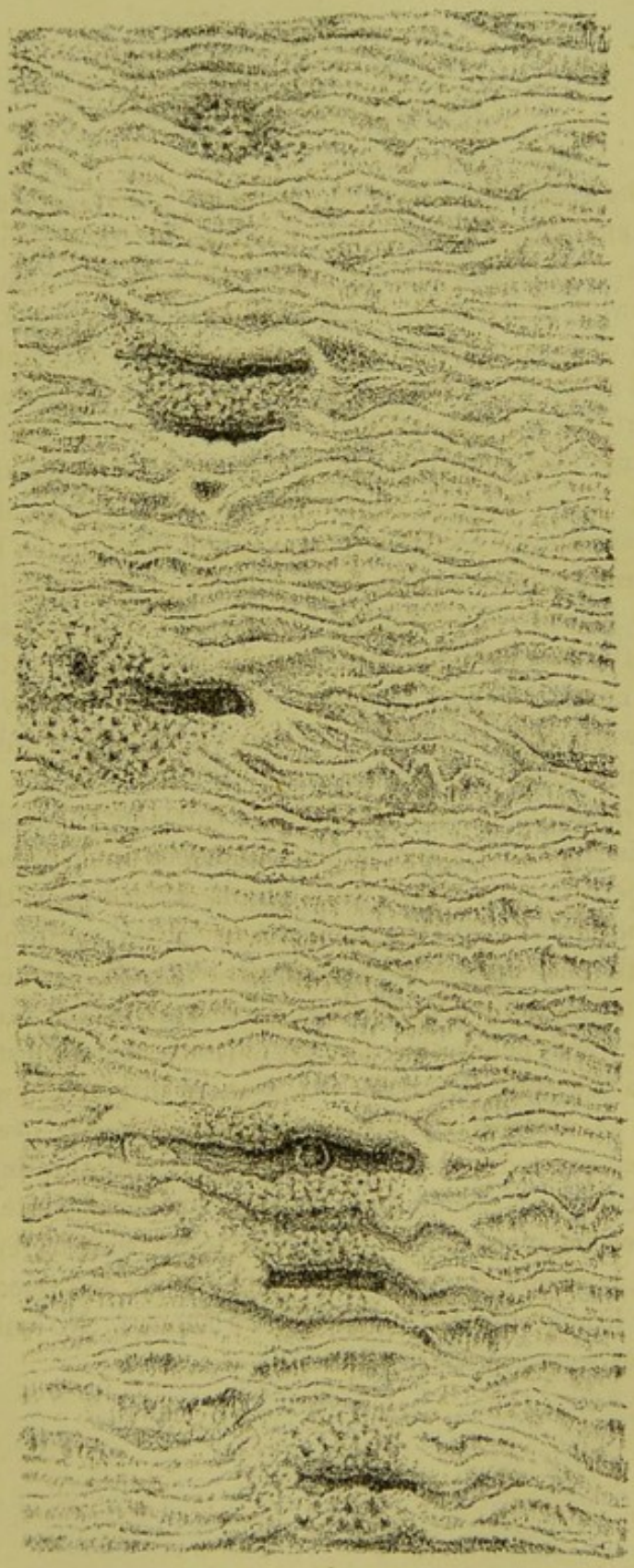


H.V.C. DEL. ET LITH.

PLATE 1*a*. *from Case No.* 2.

A portion of the Ileum from near its lower end, about $1\frac{1}{2}$ feet above the ileo-cœcal valve, and showing a series of Peyerian ulcers in their succeeding order downwards. Opposite the marginal letter *a*. is seen a small unaffected P. patch, somewhat depressed below the general level (and not raised as in Typhoid), marked with small pits which represent the site of lymph-follicles, of slightly elongated shape and measuring $\frac{1}{20}$ in. by $\frac{3}{20}$ in. Next below (*vide* Text of Case 2, in Part I.) is a parallel pair of narrow ulcers with a follicular arc between them; and just beneath the lowest (opposite the marginal b^1.) a small dark depressed spot, apparently the commencement of another ulcer-lesion and seemingly non-follicular, though this cannot be now demonstrated, because a solitary or out-lying lymph-follicle may obviously have pre-existed at the place. Opposite the marginal b^2 is a similar depressed spot seated upon the succeeding P. patch, which also appeared to represent the initiation of a necrotic band: close by there being a narrow transverse groove ending inwards as a distinct and rather deep ulcer, which projects beyond the follicular area involved—all dimensions are in the Text. *l. c.* Opposite the marginal *c*, about $1\frac{3}{4}$ inch below this and 11 inches above the ileo-cœcal valve, is shown an elongated Peyerian ulcer which presents near its middle a round aperture, now filled with lymph derived from the inflamed serosa behind; perforation of the bowel and acute peritonitis having here ensued, shortly before death of the patient. Then comes next a narrow transverse groove of partially disintegrated gland-area, which may represent an incipient ulcer; and below this a distinct and characteristic necrotic band, seated upon the same P. patch. At a short distance onward, is another patch with an ulcer of similar aspect upon it. By oversight this lithograph has been printed on ordinary thin paper, and the impression is, therefore, not so clear as it would have been if smoother white paper had been used; I somewhat regret such mishap, for in my wish to represent this striking specimen as accurately as possible I had made and rejected as less faithful two other lithographs of the parts here shown. No enlarged solitary lymph-follicles were anywhere visible.

PEYERIAN ULCERS—*SATARA.*



H.V.C. DEL. ET LITH., AUG. 1883.

PLATE 1*b*. *from Case No.* 3.

Figure 8.—A small transverse ulcer situated about 15 inches above the Ileo-cœcal valve, which had penetrated the coats of the bowel and led to incipient peritonitis, complete perforation evidently being imminent and prevented only by the prior death of the patient. *A*.—shows the aspect from within, and that the site of lesion was Peyerian, several turgid follicular pits being visible at the lower edge of the ulcer; and there is also seen amid these follicles a dark depressed spot, where necrosis had already begun and proceeded deep enough to reach the serosa beneath, producing upon it the isolated black spot (slough) noticeable in the other figure. Dimensions of the narrow elongated ulcer $\frac{7}{10}$ in. by $\frac{1}{10}$, the line and asterisk indicate spot of its deepest penetration. The mucous membrane around was more tumid and hyperæmic than usual, but the follicles of the small patch implicated are not infarcted as in Typhoid. *B*.—shows the aspect of the serosa outside, at site of ulcer-lesion within; here was an angular scarlet spot $\frac{3}{10}$ in. across, with a grey slough-like surface near its middle, upon which is the perforating point, corresponding to * in Fig. *A*. Below and to the inner side, was a second dark point of minuter size and corresponding to deepest end of the smaller necrotic spot, shown in *A*. There was some plastic lymph-exudation between these two places, and considerable injection of the serosa around.

Figure 9.—End of the Ileum, seen from within, showing to right side the lowest and largest Peyer's patch, somewhat tumefied, especially at its margin, though nowhere elevated more than $\frac{1}{8}$ in. Upon its mucosal surface are seen about a dozen ulcers of dimensions varying from $\frac{1}{10}$ in. to $1\frac{3}{10}$ in. long, narrow or elongated, slanting and sometimes deep enough to expose the circular fibres of the outer muscular coat of the bowel: some spots of sub-mucous hæmorrhage are also indicated, mostly below, where too are some darkish spots of incipient sloughing of the mucosa—the larger part of the follicular area remaining, however, entire and simply turgescent. To the left is seen, above, a few solitary glands not uniformly enlarged; next, a small follicular ulcer, slit-like or funnel-shaped, oblique and deep, and beneath some spots of sub-mucous blood-stasis. The ileo-cœcal valve is mostly free, and the Cœcum with its appendix was found quite unaffected. This specimen approached, nearest of all, to an example of Typhoid; but I noted there was no real infarction of the follicular area, which, further, by transmitted light displayed a general translucency interrupted only by an opacity at and around the sites of the ulcers—in this respect strongly contrasting with some examples of Typhoid similarly inspected.

Peyerian Ulcers—J. J. Hospital.

A Fig. 8. B

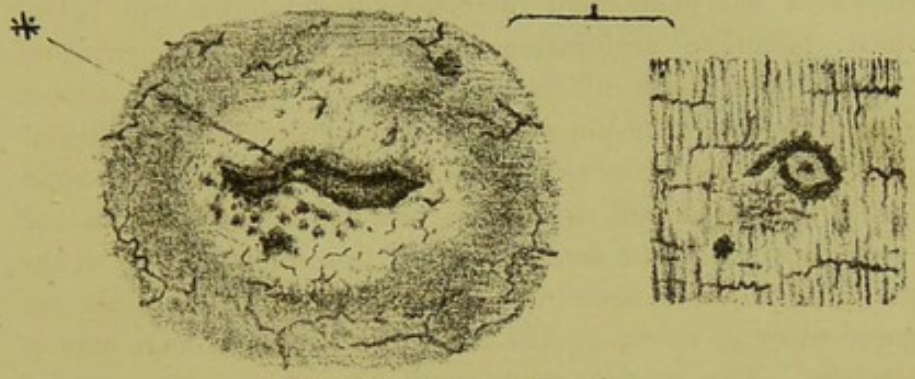
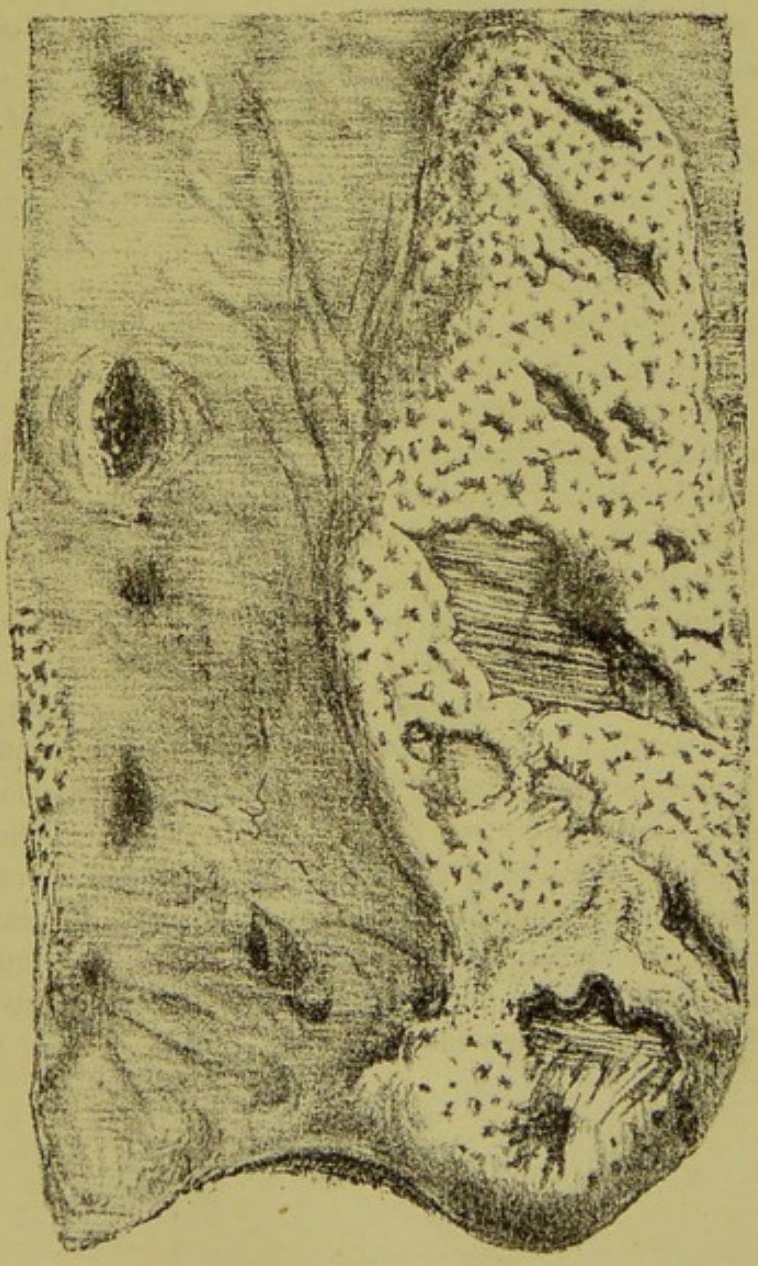


Fig. 9.



Bombay. H.V.C. del. et lith., June 1886.

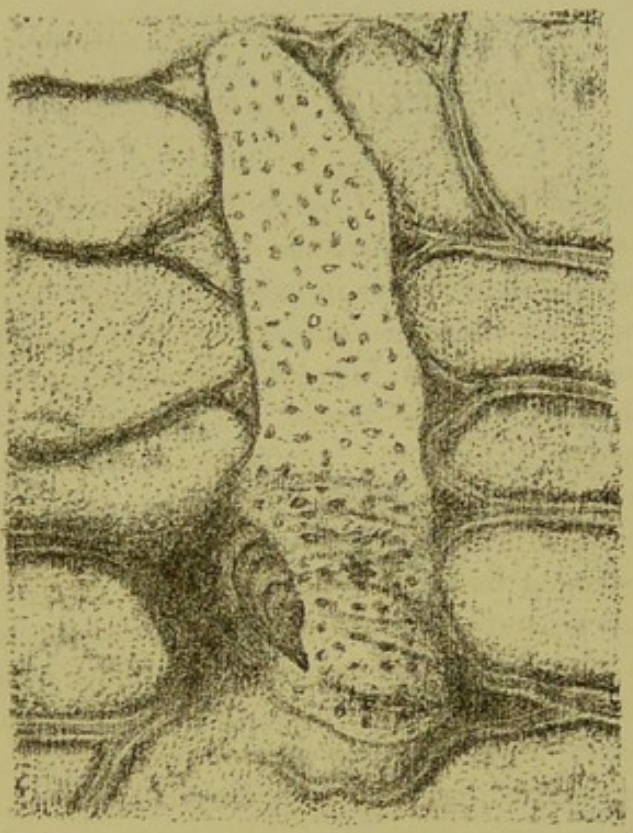
PLATE 1*c*. *Cases* 7 *and* 10.

Figure A.—From Case No. 7—*vide* Text in Part 1. Shows the inner aspect of Ileum at 24 inches above the ileo-cœcal valve; there is a Peyer's patch measuring about 2½ inches in length, of which the upper part seemed thinned, and the lower end rather turgid and reddened, presenting at one side a funnel-shaped ulcer, ½ in. long, well-defined at its follicular margin, and at the other shelving so as to expose the succeeding coats of the bowel as far as the serosa (which was unchanged); a scanty yellowish slough covered the tip of the ulcer. At this part was turgidity and a deep-red hue of the mucosa, with two large vessels converging; and from the opposite side another distended vessel passing beneath the patch, towards the apex of the ulcer. A separate dark soft spot (incipient necrosis), was noticed upon the patch near here. The mucous membrane generally seemed inflamed, and its free surface was covered with a yellowish exudation, thinnest over the patch-area, and accumulated over the sides of the turgid blood-vessels. By transmitted light the parts were translucent, except along the tracks of vessels and around the ulcer, the bottom of which however was evidently so thin that perforation of the gut appeared imminent.

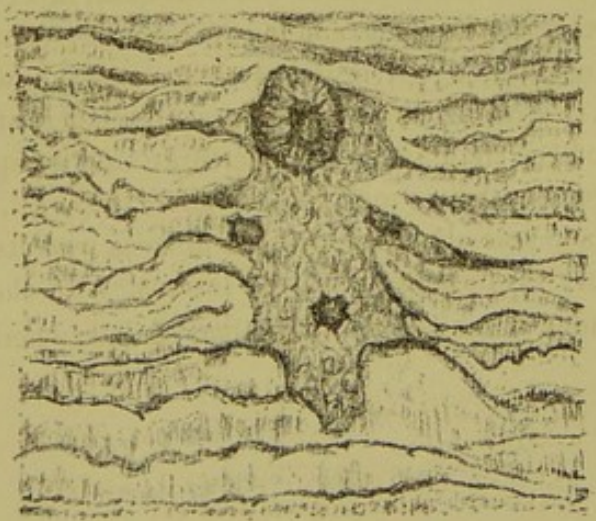
Figure B.—From Case No. 10—*vide* Text in Part 1. Shows a Peyer's patch at about 6 feet above the ileo-cœcal valve, thinned, measuring 1 $\frac{3}{10}$ in. long and presenting 4 rounded spots of ulceration or atrophic degeneration; of these the uppermost is the large ($\frac{4}{10}$ across), and exhibits within its depressed margin a radiated aspect of the next basal layer which still preserves traces of follicular structure, there being in the ulcer-centre a greater loss of substance and an absence of mucosal elements—the whole area is much thinned, but the two outer coats of the bowel still persist, though in a more translucent state here than around. The three smaller spots are much alike, two like the larger one being marginal in site; they all, moreover, show a localised subsidence and absorption of the mucosa with its follicles: a starred or puckered aspect is notable of all the lesions. In the fresh state, a deep blue tint surrounded these spots, which had faded when this drawing was made.

PEYERIAN LESIONS—*Cases 7 and 10.*

A.



B.



H.V.C. AD NAT. DEL.

PLATE 1d.

Ileac Ulcers found in Case No. 2*, of Remittent (or Enteric) Fever, from Deesa.

Figure A.—View of one of the earliest affected Peyer's patches, situated at about 4 feet above the Ileo-cœcal valve. The follicular area covers about 1 square inch, is clearly defined by its dotted or pitted aspect, and is both generally and at margins somewhat depressed below the level of the mucous membrane around. Near its upper end, is a small ulcer of rounded shape, and with a floor sloping, wavy and deep; below is a dark softened spot, as of incipient erosion; and at its lower end there are two narrow, parallel, transverse and deep ulcer-fissures, measuring $\frac{1}{2}$ in. and $\frac{1}{3}$ in. long, with edges punched-out, ends pointed or angular, and floor presenting flattened nodules. The resemblance of these two slit-like ulcers to the lesions shown in PLATE 1*, is striking.

Figure. B.—View of a Peyer's patch similar to the above, but situated about 1 foot lower down, and more considerably destroyed by the necrotic process. There was no sign here of a preliminary elevation of the follicular area, but such follicular fragments as remained were rather flattened and thinned—see the spots indicated by the asterisks * *. The greater part of the surface of the patch has become converted into a shallow ulcer, around which the unaffected mucous membrane seems a little tumid, and whose edges are sinuous, and base rather shelving, with successive planes of atrophied mucosa (in cross bands) and slightly thickened sub-mucous connective, until nearly reaching the muscular tunic. Two transverse fissures below, indicate the original ulcer-form (similar to *A*), by extension of which the larger necrosed surface seems to be produced.

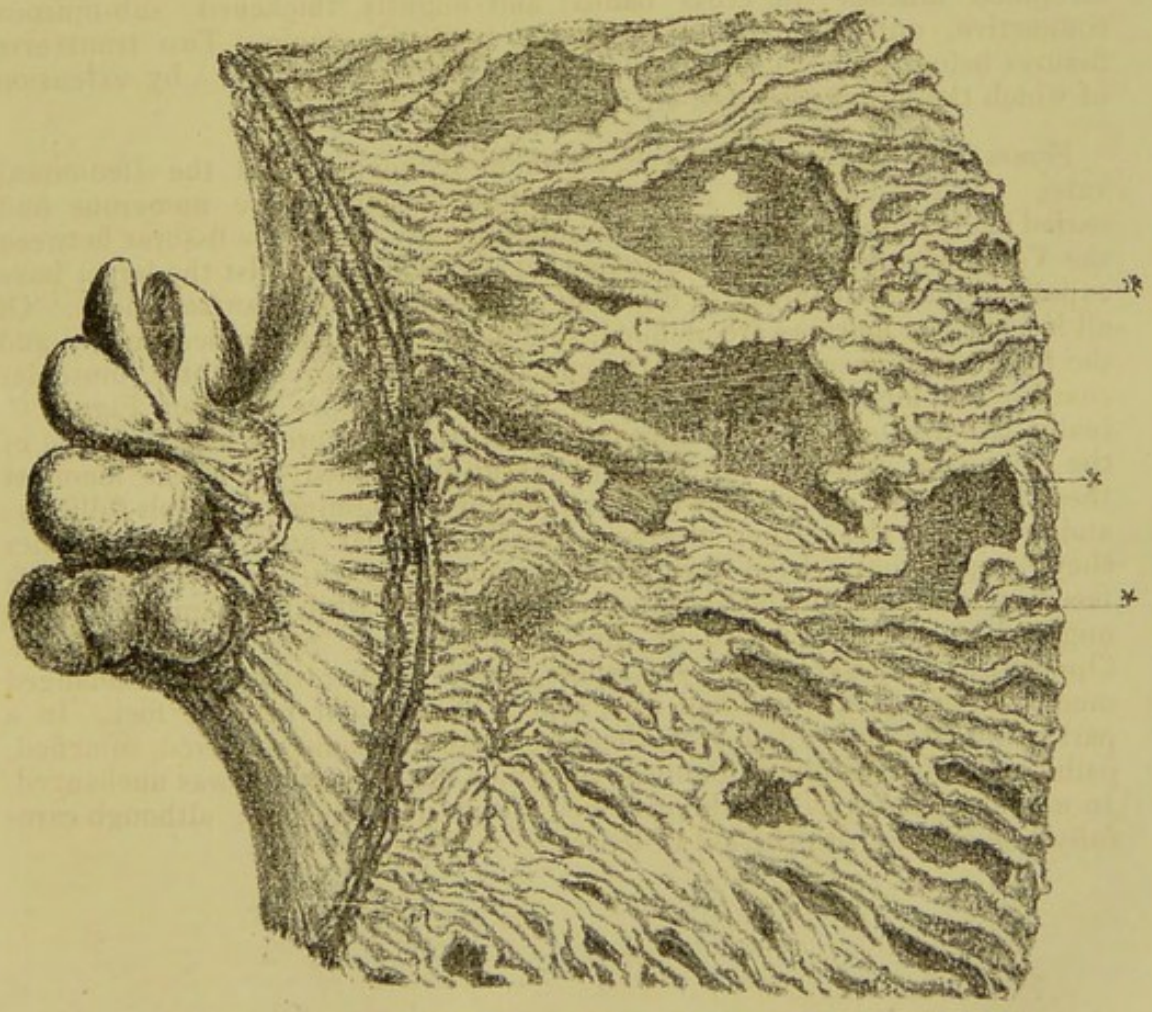
Figure. C.—Taken still lower, at about 18 inches from the Ileo-cœcal valve. At this place, the ileac ulcers have become more numerous and varied in dimensions; the smaller resembling mere transverse fissures between the Valvulæ conniventes (here somewhat corrugated), whilst the larger have expanded into wide areas of diamond or pear-shape, crosswise placed. Of all lesions, the margins are defined, sinuous and a little undermined; and the floor nearly level, exposing the connective tissue, or the outer muscular coat, or in places (of which one is visible at upper part of Figure *C.* really its valve-end) penetrating the serosa itself, whereby a perforation of the gut-walls results. Upon close scrutiny, I failed to detect amongst these lesions any clear traces of either solitary or agminated lymph-follicles: and as regards the larger ulcers, I concluded that any Peyer's patches they might have been originally connected with, were wholly effaced by spreading of the necrosis as in Fig. *B.*; whilst the smaller ulcers might have begun at site of the solitary glands, now also destroyed. Opposite * * * were noted soft spots, rather darker than the unchanged mucous membrane, which had the aspect of incipient necrotic foci. In a part of the Mesentery left here, there were present some clustered, tumefied, pallid and soft Lymphatic glands, over which the peritoneum was unchanged. In no part, whatever, was the presence of tubercle detected; although carefully looked for, with the aid of lenses.

ILEAC ULCERS—*Case No. 2* from* DEESA.

A

B

C



H.V.C.

PLATE 2.

Figure 5.—From end of Ileum, showing a Peyer's patch with a small ulcer near one end, angular, vertical, defined; on remainder of patch are two or three atrophied spots: some solitary glands are indicated near. *Vide* Case No. 8.

Figure 6.—From near end of Ileum, showing a Peyer's patch with a small angular transverse ulcer on its surface, the edges of which are defined and the base level: remainder of patch not implicated, and solitary glands not seen. Below are two ovoid transverse sloughy areas (*Dysenteric*), and above another incipient dark streak; all disconnected with the Peyerian ulcer in their sites. *Vide* Case No. 9.

Figure 7.—Portion of intestine from the Ileum, showing an ulcer occupying probably, as usual, the whole of the area of a Peyer's patch—no unaffected follicles being visible. Edges sinuous, raised, undermined; the base partly occupied with sloughy fragments. Some solitary glands are seen near. From a sporadic case of *Enteric Fever* occurring in a Native soldier—Mahratta flesh-eater stationed at Malegaon, who died about the 16th day of illness: *vide* Preparation E. 86 in the Grant College Museum, Bombay. This drawing is added for the purpose of comparison with the preceding Figures; and thereby seeing the differential anatomical characters of the Typhoid and the Septic Peyerian ulcers.

NON-TYPHOID PEYERIAN ULCERS—DR. CARTER'S SPECIMENS.

FIG. 5.

FIG. 6.

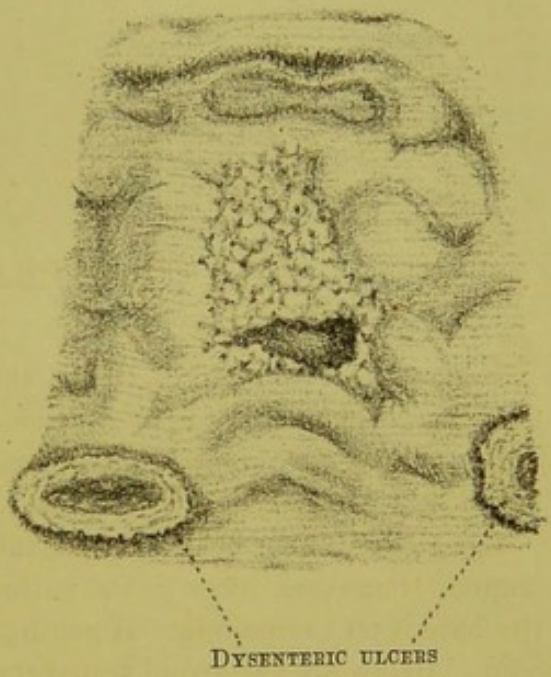
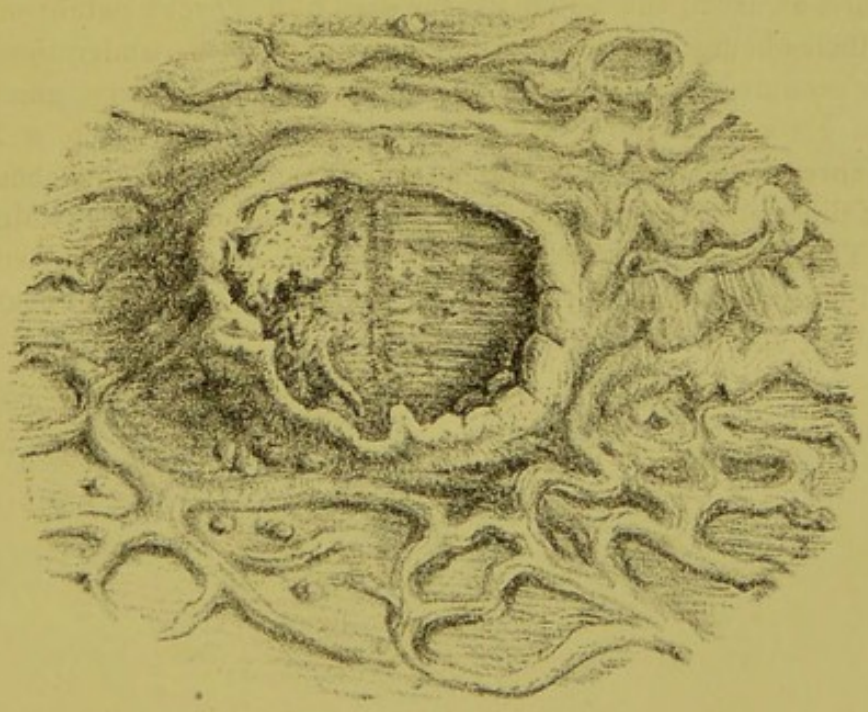


FIG. 7.—GENUINE TYPHOID ULCER—NATIVE SUBJECT—FOR COMPARISON WITH THE ABOVE.



H. V. C. AD NAT DEL. ET LITH.

PLATE 2.*

Figure 8.—Tuberculous Ulcers from the Case narrated in Part. II. under sub-heading A. Taken from the Ileum at about 2½ feet above the Ileo-cœcal valve. At *a* are two Peyer's patches, small in all dimensions and of greyish hue; their follicular area being rather depressed, and so faintly marked that their detection was not very easy. The impression hereby conveyed was that of a decided atrophy of the patches, although the mucous membrane around seemed rather turgid. Possibly, these two areas were originally joined; and at the opposite ends of each, is seen the commencement of ulceration in the form of a narrow, deep and transversely directed erosion or excavation. Signs of any tubercular infiltration of the rest of the patch, were wanting; and the usual follicular pits were shallow and sparse, the presence of villi and crypts being also hardly perceptible with aid of a lens. The fully-formed Ulcers at *b* had a transverse direction, thin, scolloped and widely undermined edges, and a highly nodulated floor upon which a narrow, cross perforation appears: the arrow passing beneath the bridge separating these ulcers, shows a continuity of their ulcerating bases. As compared with the Septic lesions, the aspect of the above was such as to suggest the idea of a certain similarity between the acuter Tubercular and the Septic infections; an alternative view being, that here was a combination of the two infections. I should rather suppose that, in essence, *tuberculosis* is a modified form of *sepsis*.

Figure 9.—Also added for purpose of comparison, as showing the aspect of an unaffected Peyer's patch in the Native subject. The follicular area is but slightly raised above the level of the mucous membrane around; its convoluted or mammillated surface is shown at *a* to be owing to a slight elevation and folding of the villi, between the pits or elongated depressions which correspond to sites of subjacent agminated lymph-follicles, or so-called 'glands.' At *b* (× 3 diameter) is further shown the apertures of Lieberkühn-crypts, often arranged as a corona to the uncovered apices of the follicles, which may project somewhat according to their actual state of distension; the crypts also exist, more irregularly, between the villi. There is, I find, considerable variation in the aspect of quasi-normal Peyer's patches; a frequent appearance here, being a widening of the follicular pits as if from general atrophy of the mucosa; and this may proceed to such an extent as in scattered spots to simulate actual erosion of the surface, without there being, however, any actual interruption of its continuity.

FIG. 8.—TUBERCULOUS ULCERS—*Case in Text.*

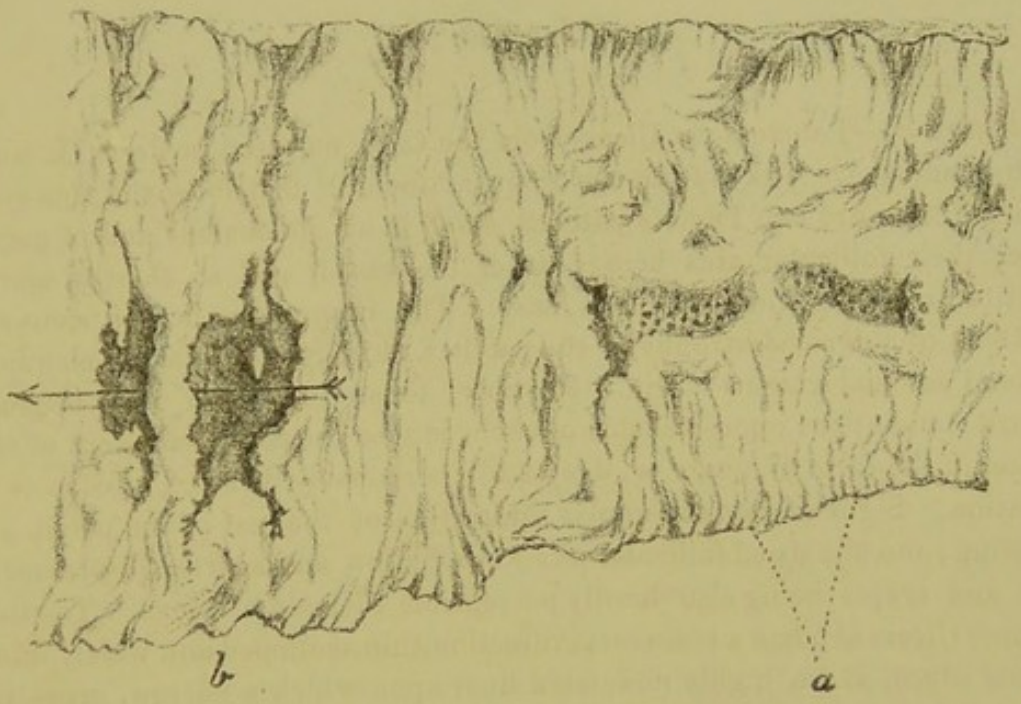


FIG. 9.—PEYER'S PATCH OF A COMMON NORMAL ASPECT.
From a Non-febrile subject.

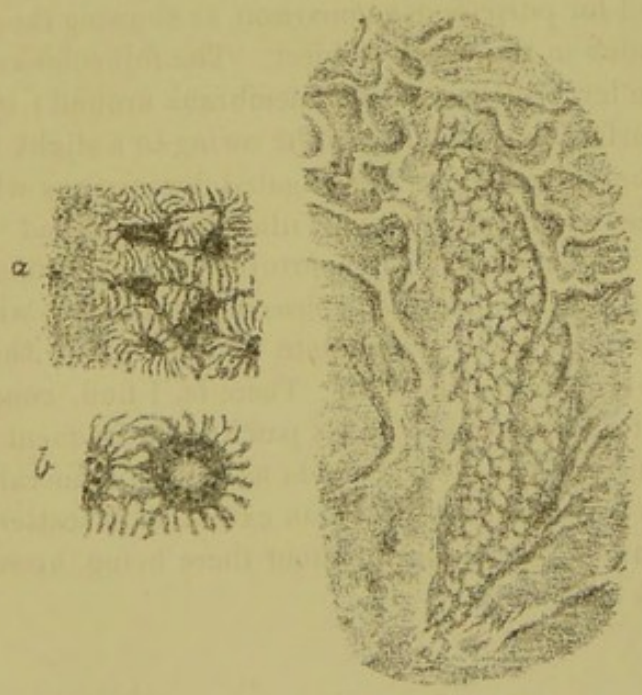


PLATE 3.

Produced by the Photo-zincograph process from a larger Ink-drawing, and intended to show some area and sectional aspects of the Septic ulcers as compared with others of genuine Typhoid in the Native subject.

To the left hand are Figures from a specimen of Typhoid:—A. Section of a small Peyer's patch at the stage of primary infiltration, magnified 1½ diameters, and showing the abruptly prominent elevation of the affected area, with site of the new "deposit' and opaquer indications of some enlarged and persistent lymph-follicles; the mucous surface being still intact. B. A small typhoid ulcer, found lower down the Ileum; necrosis having commenced at the sides and base of the morbid 'deposit,' and margins of the incipient ulcer being already left free: similarly enlarged. C. A surface-view of the margin of a small immature typhoid ulcer, showing at *a* base of ulcer slightly pitted and almost level; at *b* the raised and broad edge of the ulcer, formed of hypertrophied and necrosing mucous membrane, which still presents some traces of the lymph-follicles (at *c*) amidst the pale and turgid villous remains; at *d* is the abrupt and prominent border of the ulcer with its greatly enlarged and projecting villi, quite hiding the Lieberkühnian crypt-orifices: and at *e* the lower-level unaltered mucous membrane near. Magnified about 15 diameters. This view, as well as the Section at A. demonstrates the diffused site of the copious morbid cell-infiltration of the P. patch, proving that the lymph-follicles themselves are not, at all events for long, an especial centre of enlargement; and in figure C. they appear from the surface as if rather smaller than normal (these measuring about $\frac{1}{3\frac{1}{2}}$ in. across) and have a sunken or atrophied aspect, the radiating crypt-orifices around their pits being stretched and as if wasted.

To the right hand are figures from my specimens of the Septic ulcers. At A. section of the Ileum over a Peyer's patch seemingly about to become the site of ulceration; the follicular area is to the right, where a certain amount of turgescence is indicated, but this figure is too blurred to show the distinct thickening of the coats which the original drawing has clear enough: the contrast with fig. A. to the left is, however, unmistakeable and characteristic: magnified 1½ diameters. B. Section of a small marginal ulcer, the follicular side being to the left and very little altered in aspect: there is no remains of a slough, the base of the ulcer is thin and concave, and its outer mucous edge (to the right) only moderately elevated. For comparsion with B. above. C. A surface-view of ulcer shown in PLATE 1. fig. 1.; the parts are rather shrunken by action of the preservative fluid, though thereby rendered more distinct. At *a* is base of ulcer marked by transverse muscular bands, with minute blood-streaks between them, and at one end a nodular projection of hardened sub-mucous connective-tissue. At *b* is margin of ulcer, well defined, thin, overhanging, and displaying the normal villous, cryptic, and follicular structures of the mucous membrane very little changed in aspect, except that the villi become flattened folds by some enlargement, contrasting thus with their huge turgid projection in the opposite figure C. The pits corresponding to the agminated lymph-follicles are hardly disturbed here (at *c*) still presenting a quasi-normal size, form, convex base, and circle of crypt-openings: the contrast with C. opposite being very marked. At *d* is margin of the P. patch, distinct, yet little elevated, and here shown much too dark as if considerably raised; the original drawing indicates comparatively little difference in shading along *d*. At *e* is the mucous membrane around, unaffected in aspect. Magnified about 15 diameters.

The two series of Figures now submitted will be sufficiently clear, upon close examination, to preclude the necessity of a more elaborated description and contrast. It will be apparent that, as compared with Typhoid, the Septic lesion is not preceded by a copious cell-infiltration, but results rather from an atrophic process not attended by much 'irritation' of the tissues involved: necrosis being progressive and complete, so as to leave a well-defined limit—the punched-out aspect—and, moreover, being restricted to comparatively narrow spaces in the follicular area. These differences of aspect are however, consistent with a certain common character of the two lesions; and from this point of view, the Typhoid would be distinguished by its redundant, more 'irritative,' and slower-progressing features.

Figure D.—Section of smaller Ulcer from Case No. 1; ? follicular; showing turgidity and infiltration of the sub-mucous connective, while the super-jacent mucosa is not particularly implicated: × 3 diameters. Here, as in the two following Figures,—*a.* is the mucosa, *b.* the sub-mucous connective, *c.* the muscular coats, *d.* the serosa, *e.* blocked blood-vessels in the sub-mucous connective tissue, *f.* the necrotic area or ulcer-space. Figure E. Section of Ulcers seen in PLATE 1, fig. 2, also showing how little the follicular surface suffers. Figure F. Section of small Ulcer from Case No. 5, displaying an excessive and unusual vascular infiltration of the muscular coats of the Ileum, and as well of the sub-mucous connective over a limited 'ecchymosed' area, visible externally and within corresponding to a minute 'ulcer,' around which the mucous membrane was simply turgescent: it was in such a specimen that I found blood-vessels blocked by micrococci, and evidence of the mode of formation of one kind at least of these Septic lesions.

PLATE 3

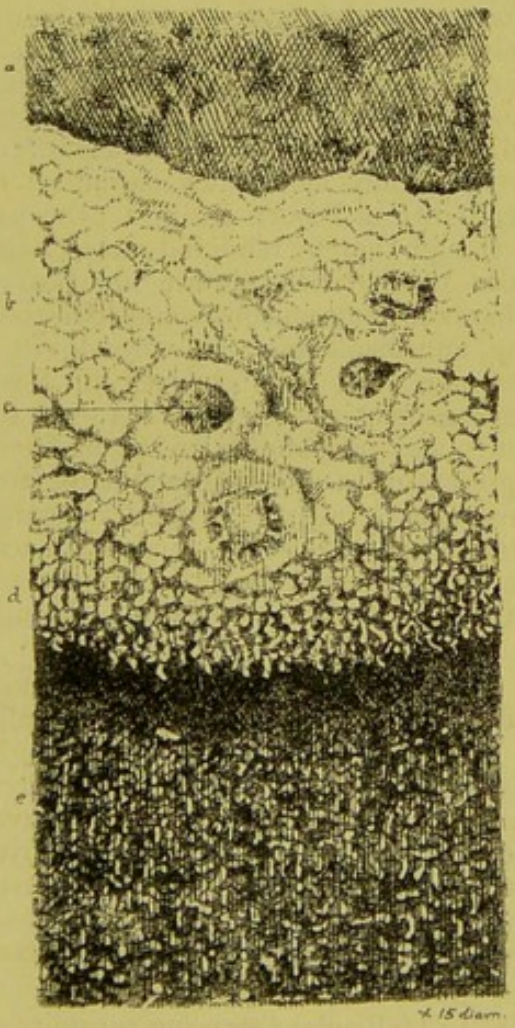
COMPARATIVE AREA and SECTIONAL VIEWS of ULCERS

TYPHOID

A

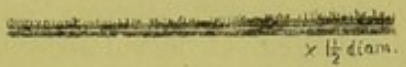
B

C

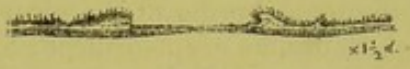


SEPTIC

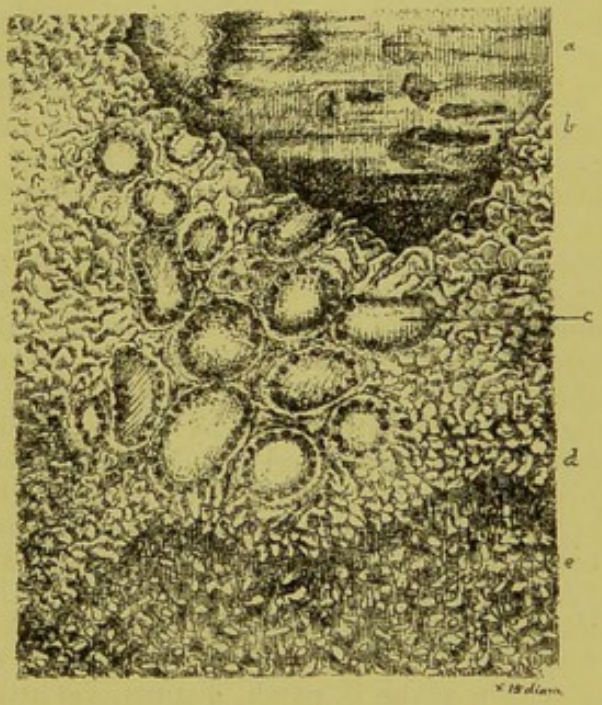
A



B



C



D

E

F

Reduced by Photozincography.
Govt Photozinco: Office, Poona, 1886.

BOMBAY 1886. H. V. C.

PLATE 4.

Enlarged views of the intestinal Ulcer-lesion, and of some foreign Organisms connected with it.

Figure A.—Vertical section of the Ulcer shown in PLATE 1*, Fig. B ; specimen stained, × 10 diameters, and drawn by aid of camera lucida. In the centre, is the solution of continuity forming the lesion ; to the right is the boundary formed of unchanged mucous membrane, here elevated into a narrow fold ; and to the left, is a portion of the Peyerian patch to which the ulcer belonged, here somewhat raised in the neighbourhood of the ulcer and infiltrated with cells. The lymph-follicles remaining on the patch are seen to become turgid and approximated near the edge of the ulcer ; the mucosa over them, with its proper musculosa, is not materially affected ; and their deeper limits remain tolerably defined—the whole follicular change hardly exceeding the possible effects of an inflammatory irritation, due to the necrotic process itself. The sub-mucous connective tissue at the P. patch is thickened by vascular and cell-multiplication : while towards the free mucous membrane, these changes are much less marked. The outer muscular and serous coats of the bowel are shown to be turgid and infiltrated, where they constitute the basal portion of the ulcer ; and perforation seems threatening at one central spot.

Figure B.—Another section of the same Ulcer, taken rather to one side in order to show the character of the basal nodule described in the text. This is seen to be formed of infiltrated connective tissue, still persisting at bottom of ulcer. To the left is a fragment of the P. patch, with lymph-follicles unchanged except by a slight turgescence ; the margins of the ulcer are formed of thickened sub-mucous connective, and still show remains of L. follicles ; the underlying musuclar and serous tunics of the bowel, are altered only as above.

These two sections are two of twelve prepared for me by Messrs. Cole of London, and stained with logwood, picro-carmine and magenta blue ; they have been compared with other moist and unstained sections, tested further with acid and alkaline re-agents ; and they were also contrasted with stained preparations of ordinary Typhoid ulcers. The result is briefly stated in the text, namely, that the Septic destructive lesion though connected with the site of the lymph-follicles, yet does not involve the follicles themselves so widely or so largely as is the case in genuine Typhoid. In both lesions, the sub-mucous connective is the chief seat of swelling ; but almost exclusively so in the Septic. With higher optical powers ($\frac{1}{12}$ in. immersion), I did not detect any considerable differences in the form or arrangement of the cell-infiltrations, or in the adenoid, vascular and other structures of the part involved ; and hence have not thought it necessary to append other illustrations. Apart from its so-called bacillus (the significance of which is variously interpreted), I am not aware that the Typhoid lesion presents any histological features peculiar to itself : or such as might not be found in the Septic lesion. Not a bacillar, but a micro-coccus organism was seen in those of my specimens specially examined ; the significance of which is also open to a varied interpretation. Upon recondite points of this kind, I have purposely refrained from comment, preferring to wait awhile.

Figure C.—Section of a blood-vessel found in the floor of a small Ileac Ulcer in Case No. 5, amidst the loose, dark and turgid connective tissue at a deep-seated spot in contact with the circular fibres of the outer muscular coat of the bowel. Liquor potassæ has been added : magnifying power 600 diameters. The small vessel seems to be a vein-branch, and it is completely distended with 'cocci.' There was some blood-extravasation around, and at *a* free red discs are shown amongst the undissolved connective fibrils. Similar elongated 'coccus' plugs were found in connection with a large sub-serous petechical effusion of blood, in the walls of the stomach.

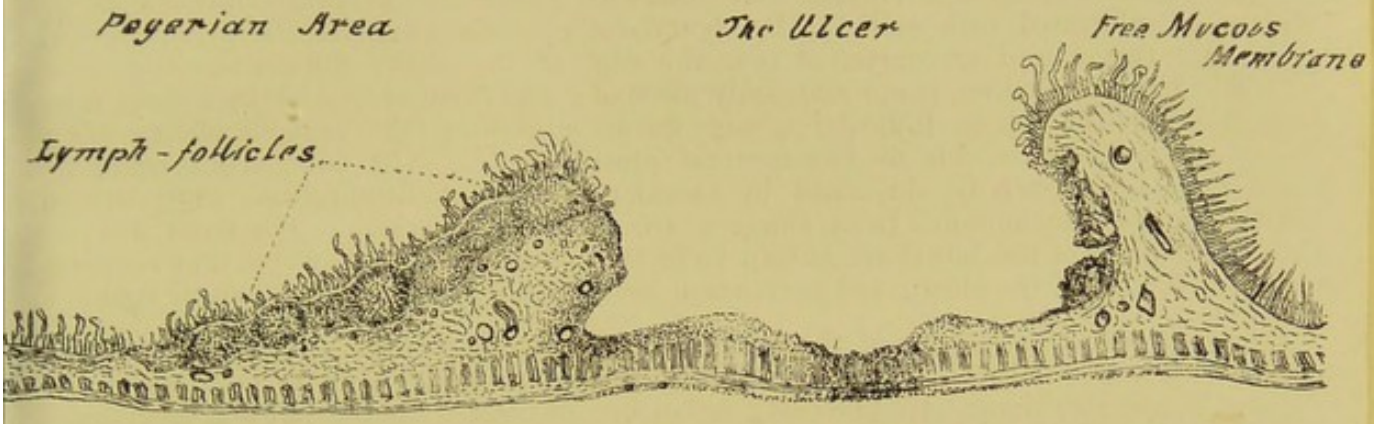
Figure. D.—From Case No. 1. Micrococci in connection with a small blood-vessel at the edge of an ulcer. + acetic acid and glycerine. × 600 diameters. A larger vessel not far off, and dense masses of small-cell infiltration, with much hæmatin-staining. The organisms here seem to be in the peri-vascular lymph-sheath, and often as at *a,a* within its endothelial elements. They were also detected within the smaller vessels and lymph-channels, being very numerous at this outskirt of the focus of cell-infiltration, in almost all the inter fascicular spaces of the connective tissue. Their dimensions were rather smaller than those of the specimen in Fig. C.

Figure E.—Structures in the sub-mucous connective tissue beneath an ulcer, from Case No. 4. + liquor potassæ. × 600 diameters. There is seen a small bifurcating artery: and in more or less close connection with its walls are several ovoid, translucent, yellow-tinted masses, which have a hyaline or quasi-resinoid aspect, and are unaffected by acids or alkalis. The marks of blood, stasis and cell-infiltration were present around. At *a,a*, are shown groups of micrococci in defined cells, either lymphoid or endothelial ; and upon search it seemed that these coccus-bearing cells, where investing the walls of minute blood-vessels, had become enlarged, losing their nuclei, and being converted into tinted hyaline nodules ; which when aggregated and detached, formed the resinoid masses. At *b*, such transformation is indicated, and other preparations showed advancing stages of polypoid attachment to the vessels prior to liberation of the masses. Similar appearances were detected in section of ulcers from Cases Nos. 1 and 6. There were no signs of ordinary 'coagulative necrosis' in the affected parts ; and it seemed to me that these hyaline bodies were a special product of lymph cell-growth, attributable to the irritative and chemical agency of the cocci : their immediate relation to the super-jacent Ulcer-lesion was conjectural rather than very evident.

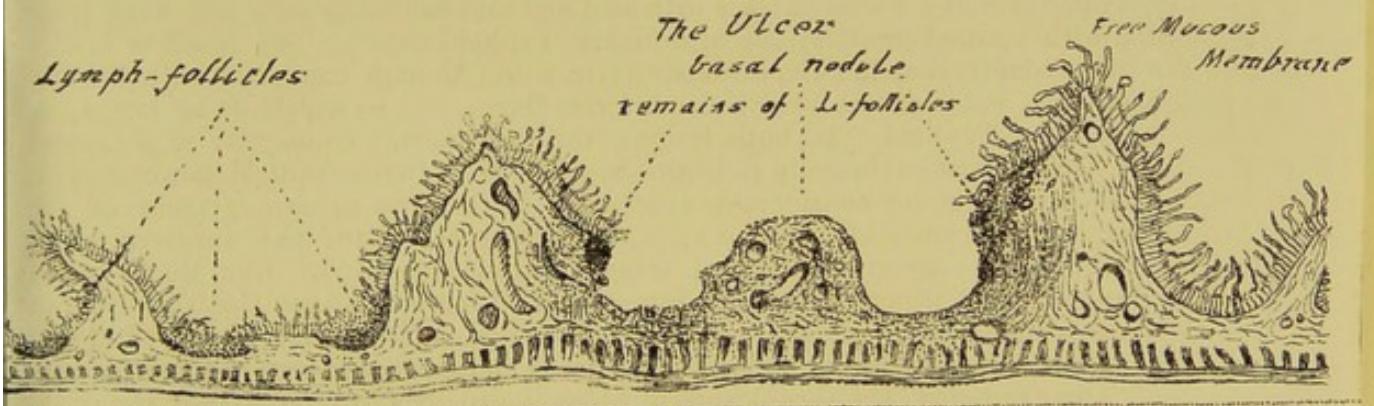
PLATE 4

VERTICAL SECTIONS OF ULCER Case no. 1 x diams. 10

A



B



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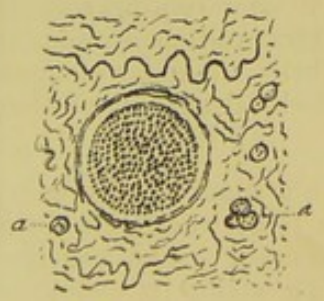
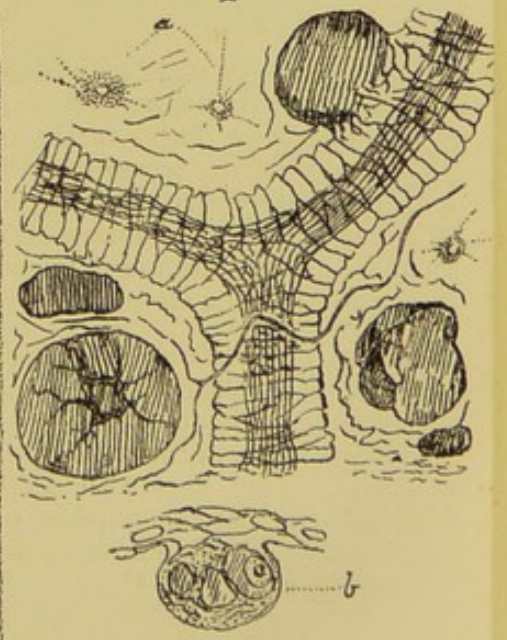


D

E



MICRO-ORGANISMS and ORANGE-TINTED BODIES.

H.V.C

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P