

REPORT ON AN OUTBREAK OF CHOLERA IN GORAKHPUR JAIL, 1877.*

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(A.) MEDICAL HISTORY OF THE OUTBREAK.

I.—CHARACTERS AND SYMPTOMS.

(a.) *Period preceding true Choleraic appearances.*

1. In slightly more than one-half of the seizures, *viz.*, 11 out of 20, diarrhœa pre-existed in three instances even for a week or over. This latter was ordinary diarrhœa. In the other cases the diarrhœa more immediately preceded choleraic symptoms. This was "premonitory" diarrhœa, but it had not as yet the appearances of true choleraic diarrhœa—of what Goodeve calls, the evacuation stage.

(b.) *Period embracing true choleraic symptoms.*

2. In an exceptionally large proportion of cases, *viz.*, 9 out of 20, true choleraic diarrhœa formed the very beginning of the attack. It did not, however, as a rule, last long, whether supervening on premonitory diarrhœa or from the first established, but speedily passed into the stage of collapse, or eventuated in recovery. In this stage vomiting appeared, and purging was more copious as well as characteristic. There did not appear to be much difference between the discharges in the favourable and fatal cases. Perhaps in the latter they may have been somewhat more profuse, but this was not clearly marked.

In 5 cases this choleraic diarrhœa eventuated in recovery, in 14 in collapse, and in 1 in death.

3. When collapse followed it seemed to hurry on. In 11 cases out of the 20 seizures it was strongly marked, and of these 9 proved fatal. In the other 2 or 3 cases it was but slightly marked, the symptoms being not strongly developed. During this stage sleep was wholly absent in 12 cases and partially so in the remaining.

4. Urine was wholly suppressed in 10 cases and partially so in the remaining 4. As a rule all evacuations ceased; vomiting invariably being absent. The pulse was either quite imperceptible or nearly so. The temperature was exceedingly low. Dyspnœa was invariable, but cramps unfrequent.

5. Secondary fever was in no case markedly developed, and in most cases not at all. In 6 cases there was reaction, but in none of them was there any tendency to cerebral or pulmonary complications.

6. The event was, as has been stated, fatal in 12, favourable in 8 cases. Of the former, death took place in 11 cases during collapse, and in 1 case during the evacuation stage. Of these there were entire absence of sleep and suppression of urine in 10, partial lack of sleep and suppression in 1, and in 1 neither symptom was present at all.

Of the 8 that recovered, sleep was entirely absent in 2, and partially absent in 1; urine wholly suppressed in 1, and partially suppressed in 2.

II. TREATMENT.

This may be conveniently divided into prophylactic measures and remedial medication.

(c.) *Under the former are enumerated:—*

7. Establishment of quarantine, which was done even for some considerable time prior to the appearance of cholera in the Jail.

8. Rice and gram were withdrawn from the diet scale, as both in seasons of ill-health tend more or less towards the begetting of diarrhœas. Limes and lime juice were issued as extras.

9. Drinking water was boiled and filtered before distribution.

10. All barracks were *leaped*. They were thoroughly fumigated with wood smoke, and repeatedly and most thoroughly purified by sulphur fumes. These fumigations were made both prior to and during the epidemic.

11. Disinfectants and deodorants were regularly employed in all night soil vessels, and their use was nearly general throughout the jail. Sulphate of iron and McDougall's powder were most largely employed.

12. All clothing worn by those attacked was, no matter what the event of seizure, promptly burned.

13. Lastly, here may be mentioned that, practically, all of the prisoners confined in the tainted half of the jail were ultimately marched into camp. They remained under canvas for three weeks.

14. These measures were carefully carried out, and I believe did exercise an influence antagonistic to the spread and continuance of the epidemic, but they did not, I think, modify its type or render it less virulent.

(d.) *The remedial treatment was as follows:—*

15. Pre-existing ordinary diarrhœa was treated by chalk mixture, kino, gallic acid, or Dover's powder, sometimes with the addition of quinine, sometimes of a bicarbonate and bitter infusion according to the character of the flux and nature of the case.

16. Premonitory diarrhœa was generally treated, first by the ordinary cholera pills—opium, assafetida and pepper—a supply of which was issued to all *lumberdars* of barracks who administered these pills according to understood instructions to any man who overnight became attacked by diarrhœa. On removal to hospital in the morning chlorodyne was, as a rule, afterwards administered, and in several cases symptoms were thus controlled and did not pass into those of any true choleraic stage.

17. From the moment, however, of choleraic symptoms appearing, the treatment in every case consisted of the hypodermic injection of hydrate of chloral combined with sulphur fumigation. The latter was carried out strictly in accordance with the directions embodied in Medical Department Circular Memo. No. 96 of 10th October 1876, and was both early begun and thoroughly kept up throughout. The chloral treatment was performed with as great an accordance as possible to the plan recommended by Surgeon A. R. Hall. The solution used was of the same strength as his. The dose was the same, and it was injected as often as the symptoms seemed to demand, and though one case had a history similar to that of the fatal case narrated by Mr. Higginson in the *Practitioner* of July 1875, I think I may say that in all the others there was no hesitation in repeatedly using the syringe when symptoms refused to improve. These injections were made in all stages of the disease very soon—and always as soon as possible—after the first appearance of choleraic diarrhœa, even to the super-vention of death.

18. When this course of treatment was once entered on, all other save the sulphur fumigation was stopped. Only food, cold water, and in convalescence a mild quinine tonic were given besides.

19. What then caused a mortality of 60 per cent. in this outbreak, and almost no mortality in the cases Dr. Hall refers to, and those which Mr. Higginson narrates in the journal above referred to? I entered on the plan of treatment by chloral injection with hope and confidence, and as case by case failed to recover, my disappointment was not small.

20. Has Dr. Hall expected too much from the remedy, even supposing his theory of sympathetic irritation to hold good? It is true, as he states, that chloral is a heart depressant arresting that organ in death in complete diastole; also that it dilates the superficial arterioles, causing hyperæmia of the skin.

But, on the other hand, Dr. W. H. Hammond, and, independently of him, Dr. Weir Mitchel, have proved that under the influence of chloral the brain at least (though at first slightly congested) becomes anæmic by contraction of its vessels; and even Dr. Fothergill, whom Dr. Hall quotes, points out that by dilatation of the skin arterioles, deeper seated organs become anæmic from contracted arterioles.

21. It may, therefore, be that this contraction of deep-seated arterioles (which, however, would in health result in anæmia) adds to the contraction which Dr. Hall shows to be, because of irritated vaso-motor centres, already existent in all the arteries of the body, and which, according to him, results in congestion of the pulmonary vessels.

22. Yet this is not likely to be the case, because the lessening of the calibre of the deeper seated arterioles seems not a direct result of chloral action, but a secondary dynamic effect of the dilatation of the superficial arterioles on which chloral appears to act more powerfully than on those of internal organs. At first it probably acts on them, slightly dilating them too, but by reason of its greater power on, or affinity for, the skin arterioles these latter are superdilated, leading to complementary dynamic contraction of visceral arterioles. If so, such a reaction would decidedly tend to remove the lung congestion, and chloral would act in doing so somewhat even more powerfully than Dr. Hall has pointed out.

* For this Report we are indebted to the Surgeon-General, Indian Medical Department, who has kindly placed it at our disposal.—*Editor.*

23. One objection, however, though a remediable one, does exist to the treatment by chloral of the collapsed stage of cholera. Liebrich, Tay, Hammond and Fothergill, all admit that chloral in full doses greatly lowers the temperature, while Dr. Lauder Brunton finds that large doses will so depress it that it cannot be measured by an ordinary clinical thermometer. To counteract this effect, however, external artificial warmth can readily be supplied and kept up, and this I think should never be neglected, both because thus the desirable will be increased and the undesirable obviated in the action of the chloral administered.

24. Among other heart sedatives, which Dr. Hall formerly enumerated as being likely to prove of benefit in cholera, were these, viz:—Ipecacuanha, tartar emetic, digitalis and aconite. To the first three he himself offers objection, and to aconite the same may be made. No doubt it acts on the heart, slowing and even paralyzing it, but it does so through the muscular substance and ganglia of the heart itself, and does not exercise any influence through the vaso-motor centre or nerves, the irritation of which Dr. Hall maintains to be the *origo mali* in cholera. Aconite cannot, therefore, be expected to benefit that disease.

(B).—GENERAL REPORT.

III.—PARTICULARS REGARDING EPIDEMIC.

25. In all there were 20 cases, of which 12 (or 60 per cent) were fatal.

26. The first case occurred on the 24th August, and the last on 7th September: more precisely:—

On the 24th August there were 3 cases,
 " 25th " " " was 1 case.
 " 26th " " " were 2 cases.
 " 27th " " " was 1 case.
 " 28th " " " were 2 cases.
 " 29th " " " " 3 "
 " 30th " " " " 3 "
 " 31st " " " " 3 "
 " 1st September " " was 1 case.
 " 7th " " " " 1 "

Of those of the 24th 3 died, none recovered.

" " " 25th 1 " " "
 " " " 26th 1 " " "
 " " " 27th 1 " none "
 " " " 28th none " 2 "
 " " " 29th 3 " none "
 " " " 30th 1 " 2 "
 " " " 31st 1 " 2 "
 " " " Oct. 1st none " 1 "
 " " " 7th 1 " none "

27. Except for the first severe outburst, therefore, the strength of the outbreak was manifested from 29th to 31st August, and was expended on the 1st September—the epidemic thus ending nearly as suddenly, but not so severely as it began. The solitary case on the 7th—6 days after—must not, however, be forgotten.

28. The real climax of the epidemic seems to have been reached on the 29th August, but while the number of seizures increased the severity of the disease decreased.

29. As has been already seen, the epidemic was a severe one, for a mortality of 60 per cent. of attacks is high. This fact is also corroborated by an examination of the fatal cases themselves. Of the whole 12 cases, 7 were fatal within 24 hours, and the rest, save 1, within 48 hours, from the appearance of the first choleraic symptom. One case proved fatal in 4 hours, and 2 others within 12 hours. The first of these was on the 29th August, the date on which I have said the climax of the epidemic was reached.

Further proof of the severity of the outbreak may be gathered from the foregoing sections.

IV.—PARTICULARS OF THOSE ATTACKED.

30. Sex, Male 19. Female 1. This is a large disproportion but other reasons than sex likely account for it.

31. Age.	From 10 to 20	21 to 23	31 to 40	41 to 50
	2	7	8	3

Mid-life seems from the above notably the period liable to suffer, but then it must be remembered that a very large majority of the prisoners were of that age.

32. Length of completed imprisonment.

OF, BUT NOT MORE THAN												
Weeks.		Months.										
1	2	1	2	3	4	5	6	7	8	9	12	24
1	1	3	1	2	2	3	1	2	1	1	1	1

The larger number of those attacked who had not completed a year's imprisonment is rather noticeable, for though there was doubtless a majority of prisoners having such a term of imprisonment, yet the proportion was not so disproportionate. I expect the reason is that the longer termed men were mostly of Class No. II. who are confined in the new jail, and who are, as a rule, in more robust health on admission.

33. Health at time of seizure.
 Good ... 16. Bad ... 4.
 34. Time of attack.
 Day ... 7. Night ... 13.

A large proportion for day seizures.

35. Barracks where those attacked slept.

No. of Barrack.	I.	III.	IV.	VI.	VII.	VIII.	IX.	X.	XXV.	Cells.	Hos- pital.
No. of attacks	2	1	2	2	2	1	3	1	1	1	4

36. Works on which those attacked were employed.

Mill.	Tank.	Quar- antine.	Paper factory.	Hos- pital.	Cook.	Rope.	Smith.	Durrie,
1	7	1	2	4	2	1	1	1

V.—REPORT.

(e).—Conditions external to Jail.

37. Some months before, and at the time of the outbreak in jail, cholera had been prevalent in the district. For some considerable time too it had appeared in the city, and in no part of it to a greater extent than in the *mohallas* to the south and east of the jail. Moreover, whether as more, or no more, than an accident, these *mohallas* were at the time in an unfavourable sanitary condition. They were not clean themselves, and had only a short half mile to the south-west, the city trenches, and some at least of these were generally more or less open and necessarily unsavory.

38. These form the jail surroundings on the south. Again on the west stretches a low sweep of land—the river flat—which, dry at the time of the outbreak, had not long before been thoroughly submerged. This flat approaches the jail to within 30 yards at one point, and to some 150 at the other. On part of it are the jail garden manure heaps, which are, however, composed of only surface sweepings and cuttings. Near these heaps stand the jail conservancy carts, into which is thrown all latrine matter before being finally carted away. This is done twice a day.

To the north of the jail is a large open park with a tank in its centre.

To the east is a part of the native city.

(f).—Conditions inside Jail.

39. Sanitation was undoubtedly good. Barracks, drains and latrines were clean. For some time too a new kind of night urinal had been more or less universally introduced, a great improvement on what formerly had been in use, and deodorants and disinfectants were largely employed. In the old jail all barracks are raised 2 feet from the ground, and they were at the time of outbreak short of the full number of their inmates. In the new jail the barracks are raised only 6 inches. All of them have not raised berths and they were, though not over-crowded, yet quite full.

40. Food was good, well cooked, varied and abundant. Vegetables were plentiful, and limes and lime-juice were issued as extras. Drinking water, drawn from one well for the whole jail, was boiled and filtered before issue, and had been so treated for some time.

41. The health of the prisoners had for a long time been good, and at the time of the outbreak was fair, but was not so good as in preceding months.

42. For some time before the outbreak quarantine had been established, a clear fortnight being the enforced period of isolation.

The quarantine barrack, however, was not well situated with reference to the rest of the jail. It was too central, but another barrack could not conveniently have been substituted.

43. The work on which the prisoners were employed was of different kinds,—none of it, however, too arduous, and presumably none of it unhealthy, yet from the preceding tables one branch of it—labor tank-digging—may now be supposed to have been so. Yet the locality in which the work was performed, more than the nature of the work itself, must be considered, and this will afterwards be touched on.

Again among those employed in the paper factory there were 2 seizures, and oddly enough this factory is only separated from the above-mentioned tank by the outer jail wall and a space of some 30 yards.

(g.) But how was the disease introduced within the jail?

44. First, it may have originated within the jail itself, that is, without reference to outside conditions; there may have been conditions or combinations inside jail, which alone sufficed to produce or evolve cholera factors. I do not, however, think there were. None of the conditions already described as existing inside the jail is favorable to the self-evolution of cholera. Even the drinking water, which is so often credited with the carriage and distribution of cholera germs, can hardly here be held responsible for their dissemination, for every one in the jail drank water from the same well, and yet one part of jail enjoyed an astonishing immunity.

In fact, the only condition that can be considered objectionable was the somewhat crowded, not overcrowded, state of the new jail, together with the circumstance that the prisoners there confined had to sleep at nearly ground level; yet this is the one part of the jail that enjoyed the immunity above spoken of.

45. Once more, the disease may have been brought inside from mere infection travelling over jail walls from the neighbouring unhealthy city mohallas, and the low-lying sweep of ground to the north. This supposition is so far supported by the fact that the greatest number of seizures inside the jail occurred in the hospital compound, which is perhaps the portion of the jail in closest connection with these surroundings. Against this supposition is the fact that no case appeared in hospital until 5 others had declared themselves in jail; and the portion of the jail previously mentioned as the "new jail," though not so near to the river flat as the hospital compound, is yet in as near proximity, and has as close a reference to the cholera-tainted mohallas to the south, and yet this, as has been seen, is the portion of jail that suffered least of all. Lastly, the mere fact of all the pre-existing sick being housed in the hospital compound, may well explain the greater spread of the disease there after it had once been introduced.

46. Again, cholera may have been brought within jail by contagion through some new comer from a cholera-tainted area. This supposition may, I think, be negated by the fact that, though one case did occur in quarantine, it did not occur until the very end of the epidemic, and though the quarantine yard was, as has been said, too central, and the barracks, in which the first two cases appeared, are at no great distance from it, yet there were other causes, to be afterwards spoken of, which were more likely to have induced the seizures.

47. The only remaining way in which the disease could have been introduced within the jail was by some of those employed on outside labour contracting the disease, and having so contracted it, developed and spread it within the jail. This I think most likely to be the case.

Looking then at the data regarding those so employed, one thing, and only one, is noticeable, viz., the large number of seizures that occurred among those who were employed in cleaning and deepening the tank which has been already mentioned. The soil forming the bottom and sides of this tank is pure sand. There was no rank vegetation near it, but there were decidedly fluctuations in the level of the water in it (which at that time was mostly sub-soil drainage), and at parts the lately submerged bottom lay dry or drying under a hot sun. No smell was, however, at any time discernible, and the little water in the tank was not filthy.

The locality too of the tank must be remembered. It lay to the north end of the river flat before described,—at no great

distance from the place where conservancy carts were twice filled daily, and at no very great distance from the city trenches and the river bank itself.

Indeed, part of the water in the tank was the overflow from the river, which not long before had so risen as to submerge most of the neighbouring land, and much of the subsoil drainage from that land must have found its way by percolation into the tank.

If these combinations are thought sufficient to induce cholera in those subjected for some time to their influence, it may be accepted that cholera was caught or contracted by some of the men employed on the tank work, and by him or them introduced within the jail. This is all the more likely to have been the real state of matters, because of the circumstance that the man first attacked was one of those who were employed on tank work.

48. After all it does not touch the question how the disease was actually caught or contracted: Was it from emanations from the water or soil of the tank? Was it from, perhaps, drinking the water of the tank, for it is hardly possible to think that none of the prisoners while at work ever drank it? Or was it from influences air-conveyed from conservancy carts or city trenches, or even from the tainted mohallas before mentioned, for they also lay not far distant?

To have determined these and cognate points, even had it been possible, would have demanded a closer and more searching investigation than at the time I had, or could have had, opportunity to undertake.

49. Once introduced within the jail it is more simple to understand how the cholera spread; yet even in its diffusion the well-known eccentricity of its course was to be observed. From one barrack to another at some distance it went, skipping an intermediate one only to return to its first starting point, or to continue a further zig-zag and wholly erratic course.

50. This one thing, however, most strikingly stood out, viz., that every seizure, save one, occurred in the old jail, and even the one that did happen in the new jail was in the yard nearest to the old jail, and yet, as before said, the sanitary condition seemed more favourable in the old jail because of no approach to crowding, and because of all the sleeping berths being raised.

51. The only differences between the old and new portions of the jail and their inmates that I can think of as at all likely to account for the appearance of cholera in the one, and the almost absence of it in the other, are these:—

The "old jail"—is old. Its walls, though not mouldy and though often leaped, may have suffered more or less chemical reaction, and their surfaces may be in a more or less actual, though not visible, state of disintegration.

Again, compared with the new jail, the old jail is more shut in. There are more intersecting walls in and through it,—so that movement of the whole bulk of atmosphere hanging over it is less free than it is over the other.

Lastly, before latrine matter can be removed from the old jail it has all to pass under two short but rather confined archways, and there for some short time after its passage the smell of excreta hangs; yet it should be stated that at both these places McDougall's powder is freely thrown into the air during the passage of the excreta.

Regarding the inmates of these portions of the jail, many of those in the old jail are, because so admitted, in indifferent health, while in the new jail the majority of the men are strong, well fed, healthy Domes on whom perhaps jail influences do not generally act so depressingly as on those of other castes.

52. If meteorology had any bearing on the appearance of the outbreak, it may be determined from the accompanying table:—

Month and Date.	Direction of wind.		Rainfall.	REMARKS.
	10. A. M.	4. P. M.	Inches.	
August. 10	S. W.	S. E.		
11	S. E.	N. E.		
12	N. E.	S. W.		
13	S. W.	S. W.		
14	S. E.	E.		
15	S. F.	N. E.	1.90	The rainfall occurring after a drought, only two or three days before the outbreak is worthy of
16	N. E.	N. E.		
17	N. W.	N. W.		
18	N. W.	N. E.		
19	S. E.	E.	0.31	
20	S. W.	S. W.	1.23	

	21	S. W.	S. E.	0.47	notice, especially when the nature of the ground to the west of jail is kept in mind.
	22	S. E.	E.		
	23	S. E.	S. E.		
	24	S. E.	S. E.		
	25	S. E.	S. E.		
	26	S. E.	S. E.		
	27	S. E.	S. E.		
	28	S. E.	S. E.		
	29	S. E.	S. E.		
	30	S. E.	S. E.	-18	
	31	S. E.	S. E.		
Sept.	1	S. E.	S. E.		
	2	S. E.	S. E.		
	3	S. E.	S. E.		
	4	W.	W.		
	5	N. W.	W.		
	6	S. E.	S. E.		
	7	S. E.	S. E.		
	8	S. E.	S. E.		
	9	N. E.	S. E.		
	10	S. E.	S. W.		
	11	W.	N. W.	3.22	
	12	N. W.	N. W.		
	13	W.	W.		
	14	S. E.	S. W.		
	15	S. W.	S. W.		

53. In conclusion, I would refer to what I have already written under the head of treatment. While on the one hand I cannot confidently say that the remedial were of much avail, I am on the other persuaded that the sanitary measures were of the utmost importance and of the utmost benefit. Though 60 per cent. of deaths to attacks is a high proportion, I do not think the percentage of attacks to population was so when all the conditions are considered. On the contrary, when an epidemic of so severe a type had once broken out among a population so dense and confined as was that of the jail, I should have expected a far larger number of attacks.

54. But it may be said that camping out put an end to the epidemic. I hold that the epidemic had ceased before the move to camp was made. As before stated, the epidemic reached its climax on the 29th of August, from which date it changed to a milder type, and soon after which, viz., on the 1st September, it practically ceased altogether. One case did appear on the 7th September, but the decided change of type and the long break between the 1st and 7th, when at other times there had been not a day's interval, proves that the epidemic had run its course. Not until the 9th September was a prisoner moved from jail, and even then only those in the old jail were moved, but not a single case ever appeared after the 7th, either among those who remained or among those who went. Camping then cannot at all be credited with checking the epidemic. I would again, therefore, urge the importance and benefit of always, under like circumstances, directing the greatest attention to all prophylactic and sanitary measures.

GORAKHPUR, October 10th, 1877.

A MIRROR OF HOSPITAL PRACTICE.

SEHORE CHARITABLE DISPENSARY.

**PENETRATING WOUND OF THE ABDOMEN,
WITH INTESTINAL PROTRUSION.**

By Surgeon-Major F. ODEVAINE, F.R.C.S.,
Bhopal Battalion.

(Continued from page 16, Vol. XIII.)

A MAHOMEDAN boy, aged 12 years, was, two hours previous to my seeing him, gored by a buffalo, one of the animal's horns entering the abdominal cavity.

The wounded lad was carried on a *charpoy* to the dispensary, where attempts at the reduction of the protruded intestine having been unsuccessfully made, I was sent for. On taking off a cloth which had been covering the patient, several coils of small intestine were seen to occupy the right iliac region, hanging over the corresponding region; the surface of the protrusion was smooth, shining and somewhat cold to the touch, and

of a deep purplish red, indicative, at this early stage, of obstruction to the circulation through the mesentery, which, with the calibre of the gut, were tightly constricted at the site of injury.

By partly raising the intestinal coils from the surface of the abdomen, a small wound was brought into view, which had its long axis parallel to the centre of, and about an inch above Poupart's ligament, or in the immediate vicinity of the internal abdominal ring. With some difficulty I introduced the point of my little finger into the wound above, and found a tight band formed by the aponeurosis of the conjoined tendons, which firmly embraced the neck of the protrusion, and most effectually prevented any possibility of its return. I, therefore, put the patient under chloroform, and, flexing his thighs on the abdomen, first divided the skin from the centre of the wound in a direction upwards, passing the finger within the abdominal cavity, and, having previously ascertained that no mesentery or intestine intervened between it and the peritoneal lining, I introduced a hernia knife flat on the palmar surface of the finger, and, turning its edge upwards, divided the tendinous band to what I deemed a sufficient extent, probably half an inch or more. I next gradually attempted the reduction of the protruded intestine, which was done with considerable difficulty owing to the forcing downwards by the patient, which caused the reprotusion of any part that had been returned; by keeping my thumb engaged in the wound, immediately a portion of intestine was replaced, I at last succeeded in getting all but a knuckle of about six inches passed within the abdomen; this last portion became so tense by the air from the rest, having been as it were forced into it, that it was obviously impossible to return it with any reasonable or justifiable pressure or manipulation. In the absence of an aspirator, I introduced the needle of an ordinary hypodermic syringe into the convexity of the tense intestinal walls, and, on its withdrawal, a jet of flatus escaped, thus sufficiently relaxing the coil to permit of the complete return of the last portion of the protrusion.

On this being effected, my assistant kept up a well-directed and steady pressure on the wound with his fingers, whilst I, with a long-curved needle fixed in a handle, passed three double ligatures deeply into both sides of the wound, leaving loops at the upper and open ends at the lower part; through the former a piece of *sirki* was passed, and the open ends were tied over, a similar piece of *sirki* drawing the sides of the wound firmly together. The superficial edges of the skin wound between the "quills" were kept *in situ* by a few points of interrupted suture; under the projecting ends of the quills, pieces of lint were placed to avoid pressure on the skin, a folded cloth dipped in carbolized oil was placed over the wound, next a firm pad, and lastly a broad roller; the patient's knees were bent over a thick bolster, and as he was suffering from "shock" with a weak pulse and cold surface, some aromatic spirits of ammonia with laudanum were given. Tincture of opium in ten-minim doses to be given every fourth hour unless when asleep, or should the pupils become much contracted. To get nothing but liquid nourishment, and to remain on his back with the thighs flexed.

On the following day, reaction had commenced; the bowels were moved naturally; pulse quick, but compressible; skin hot and dry; meteorism of stomach and to a less degree of the intestines; slept a little, and had taken a small quantity of milk.

Ordered half a grain of solid opium, with two grains of *assafoetida* in pill every third hour; wound dressed as before.

The third day after the accident both pulse and respiration were very quick; the skin hot and dry; abdomen tympanitic; everything taken was rejected; the patient slept little, though he did not complain of much pain in the abdomen or wound, from which a slight discharge of reddish fluid oozed out.

He was ordered effervescent saline mixture with brandy, and to go on with the opium, the compress and roller re-applied, but less firmly. The poor lad became extremely restless and much weaker, and died on the morning of the fourth day after the accident. No *post-mortem* was allowed by the patient's friends.

Remarks.—The above case shows through how comparatively speaking small an abdominal wound, such a very large intestinal protrusion may take place, thus exposing to the contact of the air and operator's hands a large peritoneal surface, greatly increasing the risk of inflammation of this membrane, and leading, as in the present instance, to a fatal termination by diffuse peritonitis.

Although I saw the patient within two hours after the accident, the surface of the intestinal coils, lying outside the abdomen, was of a deep purplish red, and the neck of the protruded