Ten years' surgery in the Kilmarnock Infirmary : being a paper read at the Cambridge meeting of the British Medical Association : with appendix / by John C. M'Vail.

TEN YEARS' SURGERY

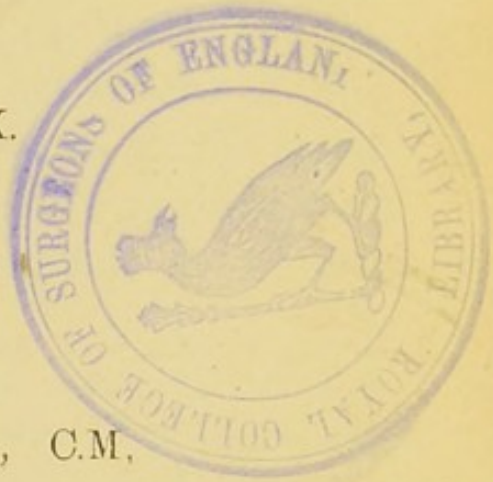
IN THE

KILMARNOCK INFIRMARY.

BEING A PAPER READ AT THE CAMBRIDGE MEETING OF THE BRITISH MEDICAL ASSOCIATION.

(*From the British Medical Journal of July 23rd, 1881.*)

WITH APPENDIX.



BY

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TEN YEARS' SURGERY

IN THE KILMARNOCK INFIRMARY.

On March 12th, 1880, I read before the Glasgow Medico-Chirurgical Society a paper entitled "Results of Surgical Treatment without Antiseptics in the Kilmarnock Infirmary." The publication of this paper in the *British Medical Journal* led to questions by letter from several well-known surgeons as to the method of treatment pursued.

I propose on the present occasion both to answer these queries and to state the results of a more extended inquiry recently made into the statistics of the hospital in question. The former paper covered only three years' practice; while, for the present one, I have examined the books from November 1869 till July 1880, a period of $10\frac{2}{3}$ years; or, practically, since the opening of the institution, as, in the previous thirteen months, only a few chronic cases were treated. To those who read my former paper, I have to apologise for a certain amount of unavoidable repetition in this one. The chief reason for enlarging to ten years the time of which the paper treats, is the obvious one that ten years' work is of more value than three years'.

A minor reason is, that in a leading article, supposed to be a summing up of the discussion on antiseptic surgery, of which my paper formed a part, the *British Medical Journal* entirely passed over the facts I had brought forward.

I shall begin by stating such facts regarding the hospital and its patients as have a bearing on the death-rate ; and, secondly, give a very short account of the treatment ; after which, I shall state the results of treatment, and compare them with those of antiseptic surgery.

The Kilmarnock Infirmary is the central hospital of a busy manufacturing and mining district. It overlooks, on one side, the poorest and most thickly populated part of a town of 25,000 inhabitants. The class of patients is such as might be looked for in the circumstances. The occupations comprise mining, iron-working, cloth-working, and ordinary trades. That the district is not a rural or agricultural one, is indicated by the fact that the proportion of primary major amputations to all major amputations was in the Edinburgh Royal Infirmary 20 per cent.,[1] and in the Kilmarnock Infirmary 34 per cent. As to the general healthiness of the locality, I may state that the death-rate of Kilmarnock during the past five years has been higher than that of either Edinburgh or Glasgow. The hospital can contain 120 beds, and is divided into fever, medical, and surgical wards, the last being on the ground-flat and containing from six to ten beds each. Till 1874, the Infirmary consisted of only fifty beds, but had then to be enlarged, owing to overcrowding. Another point in regard to the hospital is, as to how

[1] In five years and three-quarters Mr. Lister performed 80 major amputations, of which 16, or 20 per cent., were primary.

the prevalence of hospital diseases is affected by the fact that the Kilmarnock Infirmary is less than a third of the size of either the Glasgow or Edinburgh Royal Infirmaries, these being the institutions whose statistics I shall use for purposes of comparison. Other things being equal, one would say that the larger a hospital, the more liable was it to pyæmia, etc. But the claims of antiseptic surgery are so great, as entirely to obviate —nay, more than obviate—the differences on this point. For Mr. Lister says: ". . . the effect of strict antiseptic treatment by three surgeons, and non-antiseptic by the fourth, is simply to convert a large hospital into a small one with reference to the question of hospital disease." Now this is very nearly the case in the Glasgow Royal Infirmary. If, therefore, the wards of the non-antiseptic surgeon are so much benefited by neighbouring Listerites, as to be practically equal to the Kilmarnock Infirmary, the wards of these antiseptic surgeons themselves must be in a much better position, and therefore superior in this respect to those of a small hospital, where antiseptic treatment is unknown.

Treatment.—Under this heading, I shall first describe very shortly the treatment of an amputation-wound—*e.g.*, an amputation of the thigh. The ordinary flap-operation is performed, a screw-tourniquet being used to prevent hæmorrhage. No water or other liquid is applied to the surface; but, while vessels are being ligatured, blood is mopped off by cloth rags. Old shirting is preferred for this purpose, on account of frequent washing having rendered it almost clear of fibres, etc., likely to adhere to the wound. Sponges are not applied. Silk ligatures are used, and in considerable numbers. After all appreciable vessels have

been tied, the flaps are kept open until bleeding has entirely ceased, and the whole surface has assumed a glazed appearance from exposure. The wound is then closed by silk sutures, about five eighths of an inch apart, the ligatures being brought out at the lower angle. Long strips of adhesive plaster are applied between the sutures, and the stump is enveloped in a single layer of lint spread with lard. Some light covering is next put on, and a cotton-bandage over all. In two or three days the wound is dressed. A few drops of serous discharge usually escape at the lower angle, the ligatures acting as a means of drainage. Any discharge is cleaned away by cloth rags, or by some disinfectant fluid. If the latter be used, the wound is afterwards carefully dried, and lint spread with lard again applied. This treatment is repeated daily on every alternate day, until the cicatrix is complete, or the patient dismissed.

The treatment of a compound fracture can be best illustrated by giving notes of a case. W. S., miner, aged 32, was admitted April 1st, 1880, having come twenty miles by cart and rail from a pit-accident. There was a compound comminuted fracture of both bones of the leg rather below the middle. The wound was on the inner side of the leg, of an irregular shape, about six inches in circumference. The bones were got into position ; and over the wound was placed a pledget of dry lint four folds thick, which at once became soaked with blood. A many-tailed bandage was then applied, and side-splints of wood thickly padded with cotton-wool. Owing to the raggedness of the wound, it was examined in three days, and found to be doing well, and free from discharge. It bled slightly on removing the dressings, and lint was re-applied over the blood.

On April 7th, it was re-dressed. There was no discharge of any kind. Lint spread with lard was applied, and not interfered with till April 20th, when the wound was found quite healed. There were thus three dressings in all, after which the case was treated as a simple fracture.

In many compound fractures, where the wound is large, the edges are brought together by silk sutures. Where free suppuration occurs, the dressings are changed very frequently, and discharges washed out by disinfectant fluids. Drainage-tubes have been used in two or three recent cases only. All the facts as to treatment have been communicated to me by Dr. Borland.

It will be observed, then, that the treatment is of the very simplest character. The principle of it is "dry dressing." Lard-cloths are the most frequent application. Lard is emollient and unirritating, and allows lint to be removed without injury to tender surfaces underneath. It is, of course, liable to become rancid. But where there is any discharge to cause rancidity, dry dressing means frequent dressing, as the wound can be kept dry only by frequent removal of discharges; and where there is no discharge, lard can be kept on for thirteen days, as in the case of compound fracture just cited, without the rancidity being of any practical consequence. In amputations, an important point is the complete cessation of bleeding before the flaps are brought together. The wound is always allowed to glaze before the sutures are applied. The result is, that the two surfaces whose union is desired are brought into perfect contact, without any intervening substance except the ligatures. In the same way, strips of plaster bring the edges into very accurate

apposition, and support the flaps by acting as a means of pressure. Blood-dressing, as in the compound fracture case is, of course, another example of dry dressing.

Results of Treatment.—In this section, I shall first take the figures as a whole, and compare them with those of antiseptic surgery; and afterwards classify the cases, and examine the various classes. In endeavouring to make such a comparison, I am met by the initial difficulty that full statistics of Mr. Lister's hospital work have never been published. It is, therefore, necessary to have recourse to the practice of some other antiseptic surgeon. Fortunately, this is easily found, as some time ago, the *British Medical Journal* called special attention to the excellent results obtained by Dr. Hector Cameron of the Glasgow Royal Infirmary. His practice forms a high standard, as his statistics are better than those of the other surgeons practising Listerism in that institution; and I am not, therefore, taking the average antiseptic success of the infirmary.

In all, 1,448 patients were admitted by Dr. Borland in the ten years, of whom 52 died, giving a mortality of 3.5 per cent. Dr. Cameron's death-rate is 5.1 per cent. If cases which died within forty-eight hours be omitted, Dr. Borland's rate is reduced to 2.3, and Dr. Cameron's to 2.9 per cent. This rate of 2.9 on all admissions, including simple fractures, etc., is larger than Dr. Borland's death-rate on surface-lesions alone. Besides, Dr. Cameron's figures refer to only four recent years. During the past four years and two-thirds, Dr. Borland had 9 deaths in 828 cases, or 1.08 per cent.—not much more than one-third of Dr. Cameron's. A very interesting point arises here; namely, as to the progressive diminution of the death-rate during the

periods referred to. It is very frequently urged by Listerites that, as the antiseptic method approaches perfection in its details, the results obtained show a corresponding improvement. Now, it is a proverbially difficult matter in the practice of medicine, to say with certainty that a particular change in the symptoms of a case is owing to the administration of a particular medicine. In the same way, various factors may have to do with an all-round increase of surgical success. A few of these causes are: (1) a generally greater attention to hospital hygiene; (2) increased surgical skill, the invariable result of experience; (3) anxiety to give a new method of treatment a fair trial, and a consequently greater attention to every detail of every case; (4) the laudable pride of a surgeon in the general decrease of his death rate may produce an enthusiastic determination to attain to still higher success, which determination, accompanied by perfect faith in the means adopted, may go very far towards the realisation of the desired result. Now, if the perfecting of the antiseptic method be a very important agent, the consequence ought to be a greater increase of success after this than after other methods; but, if the other causes I have named are principally involved, such superiority in progress should not be visible. Dr. Cameron, for instance, distinctly attributes his success to "measures, not men"; while Dr. Borland believes the measures in question to be absolutely unnecessary. The facts are as follow.

Dr. Cameron's Results.

In the whole 4 years,		50	deaths in		1,706	cases, or	2.9	per cent.
„	past	2	„	23	„	878	„	2.6 „
„	„	1	„	9	„	505	„	1.79 „

Dr. Borland's Results.

In the whole	$10\frac{2}{3}$	years,	33	deaths in	1,429	cases, or	2.3	per cent.
„ past	$4\frac{2}{3}$	„	9	„	828	„	1.08	„
„ „	$2\frac{1}{10}$	„	0	„	421	„	0	„*

The whole difference, then, in the rate of improvement consists in the very much greater rapidity and ultimate completeness of the process in Kilmarnock than in Glasgow. Perhaps never since antiseptic surgery was introduced, have any of its advocates been able to show such unvaried success as has been Dr. Borland's lot during the past two years. Had my paper been confined to this period alone, it would have contained a report of 421 cases, 90 operations (including 23 major amputations), 45 injuries, 52 abscesses, and 7 compound fractures, without a single fatality from any cause.

In classifying the cases, I have endeavoured to obviate, so far as may be, the well known, and to some extent valid, objections to surgical statistics on the ground of unreliability. The question at issue being the best method of wound-treatment, cases in which there were no surface-lesions may be entirely excluded; and those that remain have to be arranged according to their comparative immunity from, or liability to, a fatal termination. Thus, in this respect, there is the greatest possible difference between chronic ulcers, on the one hand, and primary major amputations on the other.

* In the last annual report of the infirmary, the surgical department is debited, in this third period, with a death from general paralysis of a man aged 60, who was originally admitted with a bruised arm (without surface-lesion), which, however, was cured before the paralysis set in.

Omitting deaths under 48 hours, there are 1,429 cases to be accounted for. Of these, there were, without surface lesion, 529 cases, with 8 deaths; and with surface lesion, 900 cases, with 25 deaths. The 900 are classified in Table I.

TABLE I.—*Cases with Surface-lesion.*

Class.	No.	Died.
I. Major compound fractures ...	27 ...	0 or 0 per cent.
II. Injuries	145 ...	4 or 2.7 ,,
III. Primary major amputations (double)	3 ...	2
IV. Primary major amputations (single)	25 ...	6 or 24 ,,
V. Secondary major amputations ...	54 ...	2 or 3.7 ,,
VI. Other operations	160 ...	2 or 1.2 ,,
VII. Burns	49 ...	2
VIII. Abscesses	179 ...	3
IX. Ulcers	181 ...	0
X. Diseases of bones and joints ...	68 ...	2
XI. Other cases, ...	9 ...	2
Total, ...	900	25 or 2.7 ,,

The period of Mr. Lister's practice with which I shall compare these figures consists of $5\frac{3}{4}$ years in the Edinburgh Infirmary, after the use of the spray, the last very important modification of antiseptic surgery, had been introduced. Mr. Lister had 33 compound fractures, 7 wounds of joints, and other severe wounds, making a total of 72, with 4 deaths. These cases are somewhat comparable with Dr. Borland's Classes I. and II. united. How many of Mr. Lister's deaths were from compound fractures, I cannot tell; certainly they could not be less than Dr. Borland's, who had no deaths in this list. Table II. contains a statement of the cases. Some of them were sent in, not for treatment, but for amputation.

TABLE II.—*Major Compound Fractures.*

Case.	No.	Recovered.	Died
Thigh, ...	4	4	0
Both legs, ...	1	1	0
Leg, ...	16	16	0
Arm, ...	2	2	0
Forearm, ...	4	4	0
Total, ...	27	27	0

Dr. Borland's mortality on the two classes is 2.3 per cent. against Mr. Lister's 5.7. But, in the Edinburgh Infirmary, many injuries are treated as out-patients. The exclusion, as a possible equivalent to this, of all cases under fourteen days in the wards, raises Dr. Borland's percentage to 2.9, still hardly more than half Mr. Lister's. In the Edinburgh Infirmary, Mr. Lister seems to have had no primary major amputations of two limbs, which constitute Class III. In primary major amputations of one limb (Class IV.), the figures are nearly alike, though slightly in favour of Dr. Borland, the rates being 24 and 25 per cent. respectively. But the comparison is of little moment, the results depending much on the additional injuries received. In secondary major amputations (Class V.), Mr. Lister's mortality is 7.8 per cent., and Dr. Borland's 3.7. But Mr. Lister very properly says that two of his five deaths should be excluded on the ground of irrelevancy, death having occurred a short time after operation. The omission of these reduces his rate to 4.8 against Dr. Borland's 3.7 per cent., as Table III. will show.

TABLE III.—*Secondary Major Amputations.*

	MR. LISTER.			DR. BORLAND.*		
	No.	Recovered.	Died.	No.	Recovered.	Died.
Thigh,	26	25	1	19	18	1
Leg,	5	5	0	15	15	0
Ankle,	16	15	1	9	8	1
Shoulder,	1	0	1			
Foot,				5	5	0
Arm,	6	6	0	5	5	0
Forearm,	8	8	0	1	1	0
Total,	62	59	3	54	52	2
	Being 4.8 per cent.			Being 3.7 per cent.		

In "other operations" (Class vi), the Edinburgh mortality is 3.9 per cent., and the Kilmarnock 1.2. Mr. Lister says that many operations can be treated as out-cases antiseptically, which otherwise would have to stay in hospital. I have tried to exclude from the Kilmarnock list all such, and have thus raised the mortality to 1.8 per cent., still less than half of Mr. Lister's. Neither in burns nor in abscesses have Mr. Lister's complete figures been published; so that they must be passed over with the remark, that Dr. Borland's results are very good in both classes. I regret very much that I am unable to give the total number of vertebral abscesses treated by Dr. Borland, as in this class antiseptic treatment is said to be specially successful. But it is very remarkable that here the greatest triumphs of Listerism are obtained in a manner which, if not in actual opposition, stands at least in very doubtful relation to the theory on which the practice is founded. Mr. Lister says: "I have published numerous cases to show that a great abscess connected with disease of the vertebræ may be opened by free incision, a drainage-tube introduced, strict

* See Appendix, Table III.

antiseptic treatment being used, and that from that hour there is not another drop of pus." The case, therefore, stands thus. Before such an abscess is opened, it is protected by the completest of all coverings—the skin—and air-germs are absolutely excluded. Under these conditions, pus is produced in large quantities. Next, the abscess is opened, its contents evacuated; and, by "strict antiseptic treatment," air-germs are still absolutely excluded. Under the new conditions, there is "not another drop of pus." With germs excluded by nature, suppuration occurs freely; with germs excluded by art, suppuration ceases absolutely.

To return to the figures: in "ulcers" (Class ix) there are 181 cases, with no deaths, a fact not at all remarkable under any treatment; though, considering the large surfaces frequently exposed to the air, this also seems to disagree with the germ-theory. Neither in this class nor in the next (diseases of bones and joints) can I make a comparison, as Mr. Lister's results are unpublished. The remaining nine cases form a class, simply because they could not well go under any of the other headings. In a sentence, therefore, Dr. Borland's general results are better than those of the most successful antiseptic surgeon of the Royal Infirmary of Glasgow; and, in every one of five classes in which a comparison can be made, they are superior to Mr. Lister's.

Hospital Diseases.—Three deaths occurred in the Kilmarnock Infirmary in the $10\frac{2}{3}$ years, giving a mortality in cases liable to blood-poisoning of 0.3 per cent. One was from erysipelas, in a case of axillary abscess, in a bad subject. Not only did no other patient die from this cause, but no other case of the disease occurred. Another death was from pyæmia, on the

eighteenth day after amputation of the thigh for diseased bone. There was no *post mortem* examination. The nature of the third case was very doubtful; it was that of a strumous female, on whom a Syme's amputation was performed. The stump healed in twenty-eight days. The patient was taking out-door exercise, and was about to be dismissed, when a very large abscess formed with great rapidity over the sacrum, after the opening of which the patient sank, suffering from low delirious fever. No necropsy was allowed, and, with considerable hesitation, the cause was registered as pyæmia.

Mr. Lister's mortality from blood-poisoning is 0.7 per cent. in 845 operations. It is very difficult to make a comparison here. After all operations (including a few without surface-lesion), Dr. Borland's death-rate is also 0.7 per cent.; but Mr. Lister calls the opening of an abscess an operation, and Dr. Borland does not. If abscesses be added to the Kilmarnock operations, there would be 3 deaths in 472 cases, or 0.6 per cent. But this again is perhaps unfair to Mr. Lister, as a few of the abscesses had not to be "operated" on, they being already opened when the patient was admitted. On the whole, the results seem very much alike. As to Mr. Lister's fatal cases, the following remarks occur in my former paper: "But, on Mr. Lister's six deaths, the process of exclusion is again brought to bear. The major operations are divided into antiseptic and septic; the former were 553, with two deaths; the latter were 292, with four deaths; regarding which, Mr. Lister remarks, 'The deaths were eight times as numerous. That seems to me very instructive.' And it certainly looks bad for the 'septic' treatment. But, as Mr. Lister also says, 'Cases should be pondered, not num-

bered.' And the result of pondering is as follows. The two deaths in the antiseptic list occurred after removing the breast. The four 'septic' were: (1) amputation of the penis; (2) a plastic operation on the nose; (3) excision of the tongue; and (4) the opening of a small abscess of the neck. Now, it is obvious that, under any system of treatment, excision of the mamma is much less likely to be followed by blood-poisoning than the first three of the septic cases. In fact, of all operations, the three are among the most liable to be followed by hospital diseases. And, as the list of antiseptic cases may be presumed not to contain any such, and the septic list may include a number which recovered, the two lists are simply not comparable." Besides, it is a fair inference that, in Mr. Lister's wards, the antiseptic treatment is carried out to its very fullest extent. When, therefore, it is said that, out of 845 operations, nearly 300 were performed without antiseptics, the meaning is that, in these cases, the method was not applicable—always excepting the "major" operation of opening a small abscess in the neck, done by Mr. Lister's assistant, and followed by erysipelas, in spite of its being surrounded by all the advantages which septic cases enjoy, from mere propinquity to the spray and other germicidal treatment.

Now it is a very grave fault in any method of surgical dressing, that it is quite inapplicable during or after a large proportion of operations. Of course the deaths in these 292 operations followed septic and not antiseptic treatment; but seeing that Mr. Lister believes that his method, when properly used, prevents such deaths, he must look on those in his hands as having been owing to the absence of the treatment, and as

therefore, indirectly caused by this flaw in the method —namely, its inapplicability.

It is explained that the cause of erysipelas in one of the antiseptic operations was the momentary absence of carbolic spray from one corner of the wound. As to this and similar mishaps of antiseptic surgery, Mr. Spence well remarks that "accidents incident to any system must be included in its risks." It is a peculiar feature of the whole system that, in a case in which failure occurs, it is almost impossible to be quite certain that the treatment has been properly carried out. This does very well in accounting for failures, but a sceptic might ask, How about the successes? If two breasts be excised, and the spray fail for an instant in each, and one patient do well while the other dies of erysipelas, there must be some additional influence at work to account for the difference. Seeing that, in the absence of a wound, erysipelas may result entirely from constitutional causes, such causes have also to be kept in view when it arises after a wound.

In reference to the other deaths that occurred in the Kilmarnock Hospital, I have to state that, of the four which followed injuries, one was owing to tetanus, and the other three to severe coal-pit accidents, which rendered the cases hopeless. One died on the third day, another on the fifth; and the third (a man who had sustained fracture of the ribs and humerus, and compound fractures of the arm, ankle, leg and thigh) lingered seventeen days. The only statement Mr. Lister makes regarding his deaths from injury is that they were not owing to hospital disease. In primary major amputations (Classes III. and IV.) six of the eight deaths were the direct result of railway accidents, and the whole six occurred within a few days of admission. Of

the other two, one died from tetanus in five days; and in the last, an amputation of the thigh, the wound did well, but the patient succumbed on the thirty-eighth day to obscure intercurrent disease. I have already spoken of the deaths in Class v., which contains both of the only two fatalities from pyæmia in Dr. Borland's practice. Every surgeon is apt to have an unfortunate group of this sort. In Mr. Lister's practice the incisions of the mamma are the unlucky series, he having two deaths from hospital diseases in thirty-eight cases. In "other operations" (Class vi.), one death followed herniotomy. The bowel was gangrenous, having been strangulated five days. Death took place in seven days. In the other case a man fell from a height on a paling stob, the pointed end of which pierced the hip, and entered the pelvis by the great sacro-ischiatic foramen. On forcibly withdrawing the stob, the gluteal artery bled profusely, and was ligatured. Gangrene from the injury set in next day, and proved fatal. In Class vii., the two deaths were owing to extensive burns. In abscesses, Dr. Borland had his solitary death from erysipelas. Another death was from lumbar abscess, on the nineteenth day, in an emaciated subject, sent in without hope of recovery. The remaining death in this class took place in a man who had a lumbar abscess forming, but unopened. Hemiplegia took place on the twelfth day, and from this cause the patient died, the abscess not having been interfered with. The only surface-lesion consisted in certain sores on the legs. In Class x., one death was from periostitis, and another from disease of the knee, in a hectic subject who lived almost entirely on stimulants. The knee was quite disorganised, and discharging from numerous sinuses. A series of large abscesses

formed along the thigh, and the patient was never fit for operation. In Class XI., "other cases," a tramp died on the eleventh day from exhaustion, while both legs were sloughing off, owing to gangrene caused by exposure. The last case was admitted for traumatic erysipelas, which ended fatally. Such a case would not, I presume, have been allowed to enter Dr. Cameron's or Mr. Lister's wards. In a sentence, therefore: of the twenty-five deaths, seven occurred within four days, another six within eight days of admission; four chronic cases were sent in simply to be attended to on their death-beds; three died from hospital diseases; and one each from tetanus, hemiplegia, periostitis, severe general injuries, intercurrent disease, and erysipelas which arose previously to admission.

I have thus described what are, so far as I can discover, the best general results, covering a lengthened period of time, that have ever been recorded in the history of British hospital surgery. And the work has been accomplished in a manner totally at variance with that system which its advocates hold to be the best method of surgical treatment.

Finally, as to Listerism, Dr. Borland's position simply is, that he has never needed to adopt it. The above results have been obtained entirely without its aid; and, until distinctly greater successes have been recorded from other systems, he is justified in continuing to follow out a practice which is the matured result of fifty years' surgical experience.

APPENDIX.

Statistics for Year ending 11th July, 1881.

If the figures for this year be added to those of the $10\frac{2}{3}$ years treated of in the preceding paper, it will be found (1) that the general death-rate is lowered, (2) that the death-rate is lowered of cases over 48 hours in the wards, and (3) that the death-rate is lowered in each of the five classes comparable with Mr. Lister's cases, except in Class I. in which no improvement was possible.

During the year 188 cases were treated to a termination. The following were the deaths that occurred:—

No.	Nature of Case.	Time in Hospital	Notes.
1	Fracture of Skull, &c.,	45 minutes,	Moribund.
2	General Injuries, - -	6 hours, -	
3	Extensive Burns, - -	3 days, -	Age 82. Never rallied.
4	Extravasation of Urine,	9 days, -	A syphilitic subject, in a much reduced condition. Died of Gangrene.
5	Simple Fracture of Thigh	26 days, -	Age 74. Died of Chronic Bronchitis.

The mortality was therefore 2·6 per cent, or omitting the deaths of cases under 48 hours in the wards, 1·6 per cent.

Of the 186 cases, 63 were without surface lesion, with 1 death (No. 5 in above table), or 1·5 per cent. With surface lesion there were 123 cases, with 2 deaths (Nos. 3 and 4 in the table), or 1·6 per cent. In the following table the result

is given of adding these cases to those of the preceding period.

TABLE I.

CLASS.	In 10¾ years ending July 11th 1880.		In year ending July 11th 1881.		TOTAL.	
	No.	Died.	No.	Died.	No.	Died.
I. Major Compound Fractures, -	27	0, or 0 %	2	0	29	0, or 0 %
II. Injuries, - - - - -	145	4, or 2·7 %	29	0	174	4, or 2·2 %
III. Primary Major Amputations (double), - - - -	3		0	0	3	2
IV. Primary Major Amputations (single), - - - -	25	6, or 24 %	2	0	27	6, or 22 %
V. Secondary Major Amputations,	54	2, or 3·7 %	9	0	63	2, or 3·1 %
VI. Other Operations, - - -	160	2, or 1·2 %	19	0	179	2, or 1·1 %
VII. Burns, - - - - -	49	2	5	1	54	3
VIII. Abscesses, - - - -	179	3	24	0	203	3
IX. Ulcers, - - - - -	181	0	22	0	203	0
X. Diseases of Bones and Joints, -	68	2	9	0	77	2
IX. Other Cases, - - - -	9	2	2	1	11	3
Total, - - - - -	900	25, or 2·7 %	123	2	1023	27, or 2·6 %

If we alter Tables II. and III. so as to include the year's results, we get the following:—

TABLE II.

Major Compound Fractures.

Case.	No.	Recovered.	Died.
Thigh, -	5	5	0
Both Legs,	1	1	0
Leg, - -	16	16	0
Arm, -	3	3	0
Forearm, -	4	4	0
Total, -	29	29	0

TABLE III.

Secondary Major Amputations.

Case.	No.	Recovered.	Died.
Thigh, -	22	21	1
Leg, - -	19	19	0
Ankle, -	10	9	1
Foot, -	5	5	0
Arm, -	5	5	0
Forearm, -	2	2	0
Total, -	63	61	2

The next table gives a statement of all major amputations, primary and secondary, performed since May, 1878. It will be observed that it consists of a series of 36 cases (including 14 amputations of the thigh) without a single death.

Primary and Secondary Major Amputations, Since May 1st, 1878.

Case.	No.	Recovered.	Died.
Thigh, - - -	14	14	0
Leg, - - -	9	9	0
Ankle, - - -	7	7	0
Foot, - - -	2	2	0
Arm, - -	2	2	0
Forearm, - -	2	2	0
Total, - -	36	36	0

As to treatment, Dr. Borland states that there have been only two changes worth noting during the year. One has been the more frequent use of drainage tubes in abscesses and a few other cases. The other consists in the employment, in a number of abscesses and cases attended by chronic discharge, of Mr. Sampson's Gamgee's absorbent pads and cotton wool. These have been found most useful and cleanly, readily absorbing fluids, and forming a distinct improvement on the poulticing previously employed in such cases. The cotton of course cannot soak up the more solid parts of a discharge, consisting of 'curdy' pus. Otherwise it forms an admirable dressing.

ROBERT MACLEHOSE, PRINTER, GLASGOW.