patient died of a form of blood-poisoning, which, according to present nomenclature, we should term septicæmia. But, when I say that this was the only instance of septicæmia among antiseptic cases during the six years, and that not a single example of pyæmia occurred during that long period among patients to whom the strict antiseptic principle was applicable, including not only 553 major operations, but also a multitude of minor ones among in-patients and out-patients, and a host of trivial injuries besides those admitted into hospital on account of their severity, such as compound fractures and wounds of joints, and this in spite of hygienic conditions which, except for the strict antiseptic principle, would have been highly unfavourable, I state a fact at which I think every unprejudiced friend of mankind must rejoice.

[To be concluded.]

PROFESSOR SPENCE ON SURGICAL STATISTICS.

By W. WATSON CHEYNE, M.B., F.R.C.S.,
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PROFESSOR SPENCE'S paper on surgical statistics, published in the number of the BRITISH MEDICAL JOURNAL for January 24th, is probably one of the most powerful replies which will be made to those produced by Mr. Lister at the recent debate on antiseptic surgery. In two ways, this attack may be called powerful; for, on the one hand, Mr. Spence is well known as a most careful surgeon—careful in his diagnosis, careful in the selection of cases for operation, and careful in avoiding all irritating applications to the wounds during the after-treatment; while, on the other hand, Mr. Spence has acted as surgeon in the Edinburgh Royal Infirmary during the period in which the results which Mr. Lister has published were obtained. His remarks seem, therefore, to call for careful criticism.

The chief object of Mr. Spence's paper is to show that at least as good results have been obtained without the adoption of any strict antiseptic measures; and, in support of this, he produces a table of amputations performed long ago, and evidently selected on account of its excellence. This selection of results for comparison must, however, be strongly protested against, and contrasts very unfavourably with Mr. Lister's complete statement of the cases occurring since the more recent improvements in antiseptic treatment have been introduced. Mr. Spence, indeed, attempts to say that Mr. Lister's is also a selected period; but in this I venture to think he is wrong. For, in judging of the usefulness of a certain method of treatment, one must look at results obtained when that method has been more or less perfected. But if the method employed by Mr. Spence in the treatment of the cases referred to were a perfected one, I would ask how it is that he has come to modify it with, as seen in his later reports, very unfavourable results.

With regard to the table itself, the results are undoubtedly excellent, and, if constant, would go far to show that strict antiseptic treatment is not so necessary for ordinary cases as has been asserted. But, on looking at it more closely, we recognise an old friend; for this same table was produced by Mr. Spence in his address on surgery at the Edinburgh meeting of the British Medical Association; and, on referring to his various publications, it will be found to be an especial favourite. Seeing, however, that the results were obtained as long ago as the years 1860, 1861, and 1862, it seems high time that a new table had been constructed.

In order to obtain a complete idea as to the entire state of the facts in this important matter, it appears to me that it will be well to examine shortly what are the results which Mr. Spence usually obtains; and with this object, I shall refer, in the first place, to those more recently published by him.

In the *Medical Times and Gazette* for March 13th, 1875, is the report of his major operations from October 1872 to October 1874. Again, in the same journal for October 28th, 1876, is the report from April 1875 to the end of September 1876. And, lastly, in the November and December numbers of the *Edinburgh Medical Journal* of last year, is that from October 1876 to the end of the winter session 1878. Thus we have a record of Mr. Spence's practice from October 1872 till April 1878, with the exception of the report for the winter session 1874-75; and, as this period corresponds in greater part to that during which Mr. Lister's results were obtained, I shall state what I find.

During the first period, there were 115 major cases treated, of which 21 died; during the second, 76 cases, with 16 deaths; and, during the

third, 140 cases, with 21 deaths; thus making a total of 331 major cases treated between October 1872 and April 1878 (with the exception of the winter session of 1874-75), of which 58 died, or a percentage mortality after major operations of 17.5, as contrasted with Mr. Lister's mortality after major operations of 5.1 per cent.*

On attempting to ascertain what is the cause of death in Mr. Spence's cases, and more especially what is the proportion of blood-poisoning, I find the task hopeless; for, in 16 out of the 58 deaths, the cause is not definitely stated, though, in several instances, we are led to surmise from the facts mentioned that blood-poisoning, in some form or other, had occurred. Thus, to give two examples, we are told, in connection with a fatal case of amputation of the upper arm, that "the prognosis was favourable, as the patient was under middle age. However, he had suffered from rheumatic fever, and was stated to have had a stroke of palsy." These are, no doubt, very interesting facts, but they do not explain why the patient died. Again, the remarks on a fatal case of amputation at the shoulder-joint are the following. "At the time of the accident, the patient was out on pass from the medical house, where he was under treatment for mitral and aortic disease with bronchitis. He had also lost much blood prior to admission." An incautious reader might, in all probability, set down the cause of death, in the first instance, to rheumatic fever or to the reported stroke of palsy; and, in the second, to mitral and aortic disease. Does Mr. Spence really mean that these were the causes of death? or did the patients die of blood-poisoning, and are these facts stated as affording some explanation of that circumstance? Of the remaining 42 cases, five died within thirty hours after the operation, and may therefore be left out of consideration. In eight, the fatal result is assigned to septic poisoning: while, in several, such indefinite causes as the following are mentioned; "irritative fever", "unhealthy action in the wound", "diarrhoea and vomiting" (in several cases), "uræmia, although without any marked symptoms", "hæmorrhage, generally in the form of uncontrollable oozing" (a well-known symptom of blood-poisoning), etc.† It will thus be evident that any attempt to gain, from these statements, some true idea as to the frequency of blood-poisoning after this method of dressing would be hopeless; and it would therefore be well, as the matter is one of the greatest importance, if Mr. Spence furnished the cause of death in those cases where it is not mentioned, the pathologist's report of the *post mortem* examinations in all cases as far as practicable, and the report of his practice during the winter session 1874-75.

Looking, for a moment, at the amputations during these years, we find that 97 major amputations were performed, of which 25 died, or a mortality after major amputations of 25.7 per cent., as contrasted with Mr. Lister's mortality of 11.25 per cent. I give Mr. Spence's results in a tabular form.

TABLE I.

	Primary.		Secondary to Injury.		For Disease.		Total.	
	No. of Cases.	Deaths.	No. of Cases.	Deaths.	No. of Cases.	Deaths.	No. of Cases.	Deaths.
Hip-joint	0	0	0	0	3	1	3	1
Thigh	5	3	1	0	25	6	31	9
Knee-joint ..	1	0	0	0	0	0	1	0
Leg	4	0	1	1	8	1	13	2
Ankle	1	0	1	1	23	1	25	2
Partial of foot.	0	0	0	0	6	2	6	2
Shoulder-joint	1	1	1	0	2	1	4	2
Arm	2	1	2	0	5	2	9	3
Forearm	2	2	0	0	2	2	4	4
Partial of hand	0	0	0	0	1	0	1	0
	16	7	6	2	75	16	97	25
	or 43.7 per ct.		or 33.3 per ct.		or 21.3 per ct.		or 25.7 per ct.	

In constructing this table, I have followed Mr. Spence's division of his cases into "primary", "secondary", and "for disease": a division which he adopts, chiefly because the former groups are more liable to die of blood-poisoning than the latter. In this he is undoubtedly cor-

* As far as I can see, there ought only to be 114 major cases with 20 deaths; for in one of the fatal cases amputation was first performed through the leg for disease of the ankle-joint, and afterwards osteomyelitis setting in amputation of the thigh was done. The patient died of diarrhoea (?) five days after the latter operation.

† The number of cases which died of bronchitis and pneumonia is very remarkable. Were *post mortem* examinations made in all these instances?

rect; but, if I understand Mr. Lister aright, he contends that, with his method of treatment, he is independent of these considerations; and that blood-poisoning ought not to occur under any circumstances. When, therefore, Mr. Spence, in giving his table of amputations, confines himself to those for disease, and excludes those performed primarily or secondarily to injury, because, among other reasons, they are more liable to blood-poisoning, he begs the question entirely; and it would be very interesting to know how many primary and secondary amputations occurred during 1860-61-62, and what were the results.

The percentages given in the foregoing table, though obtained from but few cases, are much the same as those mentioned by Mr. Spence in the second edition of his *Lectures on Surgery* as the result of his practice up to 1875. He had then performed 503 major amputations (I presume in hospital practice),* of which 141 had died, or a mortality of 28 per cent. Of these 503 cases, 134 were primary amputations, of which 57 died, or 42.5 per cent.; 37 were performed secondarily to injury, with 15 deaths, or 40.5 per cent.; while 333 were for disease, with 68 deaths, or 20.4 per cent. The causes of death are not given; but Mr. Spence states (p. 644) that in primary amputations, where the patient recovers from the shock, pyæmia is the most general cause of death.

With such a heavy mortality it is not to be wondered at that Mr. Spence congratulates himself upon, and constantly remembers, the wonderful run of successful cases which he had in 1860-61-62; for in truth it would seem to be the only bright spot in a long and melancholy record of disastrous amputations. But, instead of being an argument against antiseptic surgery, it, on the contrary, when read in the light of Mr. Spence's general results, shows that the treatment adopted was not able to prevent the development of septic diseases when the conditions were favourable to their occurrence; for, indeed, we cannot imagine that a treatment which promised so much would be thrown aside for another unknown and untried method when these sixty-three cases were completed; nor that Mr. Spence would not have resorted to it again when the disastrous consequences following its abandonment became manifest. Mr. Spence may well congratulate himself that these cases occurred and were so successful, for without them we should have had a still sadder picture presented to us: a record of 440 amputations with 138 deaths, or a mortality of 31.3 per cent.

Mr. Spence's feeling of satisfaction at these results is the less remarkable when the following facts are taken into consideration. I have already stated that no definite information can be obtained from Mr. Spence's writings as to the relative amount of blood-poisoning in cases treated by so-called simple methods of dressing; but it so happens that a record, and a most instructive one, is published in Dr. Braidwood's work on *Pyæmia*†, in which he gives the number of cases of that disease which occurred in Mr. Spence's wards during the years 1859-65. As the results given in the table produced by Mr. Spence were obtained in 1860-61, this report is especially interesting, and I therefore give it in detail. (See Table II.)

It may be well, if for the sake of contrast, I here reproduce Mr. Spence's table of major amputations for disease, during the years 1860-61-62.

	No.	Recovered.	Died.
Hip-joint	1	1	0
Thigh	25	23	2
Leg	5	5	0
Ankle	22	22	0
Shoulder (injury)	3	3	0
Arm	3	2	1
Forearm	4	4	0
Total	63	60	3

Looking now at Dr. Braidwood's statement, we must in the first place notice that he only speaks of death from pyæmia, and he tells us that of 227 of the patients operated on during these six years no fewer than 43 died of pyæmia, or a mortality of 14.5 per cent. from this

TABLE II.—Deaths from Suppurative Fever (Pyæmia) in Professor Spence's Wards in the Royal Infirmary of Edinburgh during the Years 1859-65.

Date.	Total No. of Cases.	Nature of Operation.	No. of Deaths from Pyæmia.	Part Operated on
1859-60..	4	Primary amputations.	2	Both were amputations of the leg.
	14	Secondary amputatns.	1	An amputation of the thumb.
	4	Excisions of diseased joints.	1	Excision of the knee-joint.
	2	Perineal section.	1	For stricture of the urethra.
1860-61..	11	Primary amputations.	1	An amputation of the thigh.
	14	Secondary amputatns.	1	An amputation of the arm.
	11	Excision of diseased joints.	1	Excision of the elbow-joint.
1861-62..	12	Primary amputations.	3	All were amputations of the leg.
	30	Secondary amputatns.	3	All were amputations of the thigh.
1862-63..	20	Secondary amputatns.	5	Of these, four were amputations of the thigh, and one was an amputation of the forearm.
	2	Primary excision of joints for injury.	1	Excision of the knee-joint.
	5	Excision of the mamma.	1	
	9	Cases of removal of malignant tumours of the face and neck.	1	Removal of a malignant tumour of the lower jaw.
1863-64..	10	Primary amputations.	2	One was an amputation of the arm, the other of the leg.
	18	Secondary amputatns.	4	One of the forearm, two of the thigh, one at the ankle.
	8	Excisions of joints for disease.	2	Both were excisions of the elbow-joint.
	17	Removal of tumours.	1	Fibrocartilaginous tumour in long head of crural biceps.
	5	Wounds into joints.	1	A case of wound into the knee-joint.
	3	Lithotomy.	1	
1864-65..	7	Primary amputations.	1	Amputation of the leg.
	17	Secondary amputatns.	8	One amputation at the shoulder, two of the forearm, two of the thigh, one of the leg, two of the ankle.
	4	Excisions of the elbow for disease.	1	Excision of the elbow.

disease alone, leaving out of consideration the mortality from septicæmia, erysipelas, and other forms of blood-poisoning. He further tells us, that of 44 primary amputations performed during these six years, 9, or 20.4 per cent., died of pyæmia alone; while of 113 cases of secondary amputation (by which I presume he means amputations for disease and secondary to injury) no fewer than 22, or 19.4 per cent., succumbed to this disease. Further, we learn that during the years 1860-61, 1861-62, and 1862-63, there were 64 secondary amputations performed, of which nine died of pyæmia alone; or, if we substitute the year 1859-60 for 1862-63, there were 58 secondary amputations—of which five died of pyæmia; and taking these four years together there were 78 secondary amputations, of which ten died of this disease alone. But in three of these years Mr. Spence tells us that, of 60 cases operated on for disease, only one died of pyæmia; and therefore of the 18 remaining cases nine, or one half, must have succumbed to that disease, unless indeed we suppose that some of the 60 patients were operated on in private practice. However that may be, it is quite clear that immediately before and after this period several cases of amputation for disease did die of blood-poisoning, while during it more than one case of primary amputation fell victims to it. The three cases of amputation at the shoulder-joint for injury which Mr. Spence has introduced into his table of amputations for disease, must be assumed to be secondary to injury. But we learn from Dr. Braidwood's table that, to take two out of the three years, in 1860-61, one case of pyæmia occurred after "secondary" amputation of the arm, and during 1861-62, three cases of pyæmia followed "secondary" amputation of the thigh, and I have already shown that whatever three years are taken, more than two cases occurred after "secondary" amputations. As, however, Mr. Spence states that during the three years, 1860, 1861, and 1862, only one, or at most two (it is not certain from Mr. Spence's description whether the second patient died of erysipelas or of pyæmia) cases of pyæmia occurred after amputation for disease, we must conclude that the others followed amputations secondary to injury. On what principle therefore Mr. Spence includes in his table of amputations for disease three successful secondary amputations, and omits those which died of pyæmia, is to me quite unintelligible. It may be that these cases of pyæmia occurred immediately after the 63 cases mentioned by Mr. Spence. If so, I would ask on what principle he brings forward these 63 cases alone, and does not tell us that when they were concluded several cases of pyæmia occurred.

It is with considerable diffidence that I have entered into the con-

* Since the above was written, I find that Mr. Spence includes here operations performed in private practice as well as those done in hospital. Now, as many surgeons state that pyæmia is practically unknown, or at least much rarer in private than in hospital practice, the general result is thus rendered more favourable than would otherwise have been the case. But as Mr. Lister only spoke of his hospital practice, Mr. Spence, in producing results for comparison obtained "under the same hygienic conditions" ought to have omitted the cases treated in private. It is indeed possible that, although Mr. Spence had excluded amputations performed in private practice, the general result would have been but little affected; for he leads us to believe from the remarks following his tables of amputations in his *Lectures on Surgery* that, in his experience, pyæmia is by no means so unfrequent in private practice as has been supposed.

† Dr. Braidwood was personally conversant with the circumstances, having studied in Edinburgh during part of the period to which he refers, and having himself acted as house-surgeon under Mr. Spence, to whom he dedicates his work.

trovery against one for whom I entertain great respect and to whom I owe so much. But when Mr. Spence attempts to prevent the spread of a system which I know to be efficacious against septic poisoning by bringing forward an exceptionally favourable series of cases treated by a method which I know to be, even in Mr. Spence's hands, often followed by pyæmia and other allied diseases, I feel that I should not be doing my duty if I remained silent. I might have made the case against so-called simple methods of dressing as compared with strict antiseptic treatment much stronger had I, using Mr. Spence's published description, traced the progress of those cases which recovered; or had I referred to the struggle for life which I know more than one of his patients had to pass through. I have, however, preferred to meet Mr. Spence on his own ground—on his numerical results; and even though such statistics have not as a rule the power of proof possessed by cases related in detail, yet I think there can be no doubt as to their force in this instance.

ANTISEPTICS IN CATARACT EXTRACTION.*

By SIMEON SNELL, M.R.C.S.,

Ophthalmic Surgeon to the Sheffield General Infirmary.

My attention was drawn to a short reference in the BRITISH MEDICAL JOURNAL of September 7th last, to an article by Dr. Alfred Gräfe of Halle on the Antiseptic Method of Cataract Extraction. He stated that "the percentage of failures in the cases so treated was 1½, while it varied from 5 to 6 in the cases operated on before the adoption of the antiseptic plan".† On my return from my holiday shortly afterwards, I determined to adopt the plan he suggested in some of the cases presenting themselves for operation at the Sheffield General Infirmary; not that I was in any way dissatisfied with the success attained by the usual methods; indeed, I hold the opinion that in careful hands cataract extraction can hardly be expected to be successful in a much larger number of instances than it is, with the various operative procedures at present in vogue; but antiseptics being largely used in general surgery, it seemed to me desirable to test their efficacy in ophthalmic practice.

The plan carried out in all the cases, except the last, has been, with slight modifications, that recommended by Gräfe. Shortly before the time of operation, the eye was carefully washed with a two per cent. solution of carbolic acid; the eye being then closed, the external surface was well cleansed, and covered until the operation with a sponge wetted with the carbolic solution. The instruments, before being used, were permitted to remain for a short time in absolute alcohol, and afterwards were dried on lint or cotton-wool. The sponges also required during the operation were soaked in the carbolic solution, and kept applied to the eye until the *débris* or coagula, if any, were removed. A pad of lint, wetted with a four per cent. solution of boracic acid and covered with a piece of fine gutta percha tissue, was then applied, while a simple pad of lint was put over the sound eye, and over all a closely-fitting bandage was placed. Gräfe changed the dressings every twenty-four hours, but in my cases the lint was kept constantly soaked by dropping the boracic solution on to it, and only removed on about the fourth day, when it has been my custom to ascertain the condition of the eye. The dressings were renewed for the next three or four days, and then discarded for a shade. The instillation of atropine, also recommended by Gräfe, was not adopted, as I have only been accustomed to use it in exceptional cases.

No difference has been made in the method of extraction it has been my practice to adopt for a considerable time, viz., a shallow lower flap with the puncture and counter-puncture in the sclerocorneal junction, the summit of the section being situate midway between the lower edge of the pupil and the corneal border. No iris is, as a rule, removed, but if it fail readily to return and the pupil to resume its rounded form, a portion has been excised; though it is better, if possible, that it should be avoided, if merely for appearance sake.

The first case operated on by me according to the antiseptic method was on September 16th; and, since then, seven other extractions have been done; the last being, however, by a somewhat different method, and which will be referred to later on. Of the first seven, four were men and three women; three were in the right eye and four in the left. The women were aged respectively 63, 47, and 25; and the men 63, 56, and 62; this last having had both eyes operated on. In all the cases, the results were good. Three were, with suitable glasses, able to

read J. 1; while, in the others, sufficient time has not yet elapsed for them to return after leaving the Infirmary, in the usual manner, to be fitted with spectacles, and the state of their vision to be accurately tested. The immediate results, however, left little to be desired. Each of the patients complained of a good deal of pain and discomfort at the time and after the eye was washed with the carbolic solution; and in every instance, on being placed on the table for operation, the conjunctiva was found to be deeply injected and chemosed. In addition, there was some amount of thick gummy secretion, which had to be wiped away before the operation. No pain or discomfort was caused by the subsequent dressings.

The swelling of the conjunctiva occasioned by the carbolic solution is a serious hindrance to the performance of the operation, especially as in my own case, where one is accustomed to operate without fixation forceps and speculum, and merely to draw up the upper lid and fix the globe by gentle pressure with the ball of the middle finger of either hand, according to the eye undergoing operation. It conceals the corneal margin, and deceives one somewhat as to the situation of the puncture and counter-puncture.

I have said that the cases had been successful, but not more so than others operated on without such precautions; and, in some, the convalescence has certainly seemed prolonged; and, on the whole, the stay in hospital has been somewhat longer. Whether or not cases will do better in the aggregate from the adoption of this method, these cases are of course not sufficient to decide; but while it may easily be carried out in hospital practice with the assistance of an able and willing resident staff, the difficulties attending its use in private practice are obvious.

The pain and discomfort complained of by the patients, as well as the swelling of the conjunctiva noticeable at the time of the operation, induced me to substitute, in the last case, No. 8, thymol for carbolic acid, as one was led to believe its application was not irritating. The eye was washed with a solution of one part of thymol to a thousand of water. Thymolised sponges were used during the operation, and boracic acid applied on lint subsequently, and the instruments placed in absolute alcohol, as in Gräfe's plan. The thymol caused no pain nor uneasiness to the patient; and at the time of operating, the conjunctiva was in no way injected. The patient was a woman aged 69; and the operation was performed on October 28th. Since then, she has been passing through a severe attack of plastic iritis. This, however, is now showing signs of subsiding, but still it is doubtful whether the case will be able to be counted a success. (A subsequent iridectomy gave her useful sight.)

I propose, in subsequent cases, to give a further trial to the thymol method, omitting, for the future, the boracic acid, and using the thymolised solution in its place.

In conclusion, in a day like the present, when so much is heard of the treatment of wounds generally, and Listerism is so extensively adopted, I trust I shall be pardoned for troubling you with these remarks on antiseptics in cataract extractions, especially in the necessarily incomplete manner I have been able to lay the cases before you.

HOW A YOUNG CLAIMANT MAY ARISE: A MEDICO-LEGAL WARNING.

By THOMAS A. G. BALFOUR, M.D., F.R.C.P.E., Edinburgh.

ABOUT two months before the period to which my article refers, I attended Mr. X., who died of ischuria renalis. During his illness, his wife seemed to be assiduous in her attentions to him; but I was subsequently given to understand that the feelings then exhibited were very different from those which had been manifested previously. I merely mention this fact, as its importance will immediately appear.

On the 29th of December last, I received a note requesting me to call on Mrs. X. sometime during the day. As no urgency was expressed and I had many other patients to see, I did not make my professional visit to her till the afternoon. On entering the room in which she lay in bed, I was astonished to find a nurse sitting before the fire with an infant in her arms, and expressed to my patient my deep regret at not having called sooner; but at the same time I explained that I had no idea that it was a case of confinement to which I had been summoned, as there was no mention of it in the note, and as I was not even aware that she was pregnant. I was much pleased to witness the kindly spirit in which she received my explanation, especially when I thought of the severe pangs of childbirth through which she had just passed without any friendly obstetrical hand having been stretched out to help her. On making inquiries as to the time at which the child

* Read before the Yorkshire Branch, November 1878.

† Since the above was written, the recent number (No. 1, vol. vii) of Knapp's *Archives of Ophthalmology and Otolaryngology* has come into my hands, in which is a review of Gräfe's antiseptic plan. The reviewer says that, "on a visit to Halle, he was authorised by the writer (Gräfe) to add to his report that the recent results of extractions performed and treated in the same manner have been less favourable than before, showing an inordinate number of disastrous suppurative processes."