ought not to be hypercritical as to his first division of nervous diseases—general diseases, consisting of nervosity, eclampsia, epilepsy, catalepsy, hysteria, etc.—because, with few exceptions (that perhaps of epilepsy and hysteria), the lesions indicated by these names cannot yet be localised. It has seemed to me that hysteria is often excitement or hyperæmia, followed by exhaustion or spanæmia of the pneumogastric centre. But these names should set us thinking, inasmuch as nervosity is no more a disease than rapid breathing. The odd thing is that, though no medical man would dream of being satisfied with a diagnosis of *rapidity of breathing*—or *pneumatosis*, let us suppose its high-sounding title to be—still, hardly any medical man thinks of questioning the propriety of resting quite satisfied if an authority diagnose *nervosity* as the affection from which a patient is suffering! Take, again, the first section of Class IV of nervous diseases, according to the same authority. We have Section 1, *Peripheral Paralysis*, and then follows a list of paralyses of the third nerve, fourth nerve, minor portion of fifth nerve, and so on. This list is gravely offered to the profession, and men are satisfied. Yet is it not the case that “paralysis” is no more a disease than dropsy, and that the mere use of the term opens up a world of unanswered, though not necessarily unanswerable, questions, as to the condition of the paralysed nerve; as, for example, whether it is hyperæmic or spanæmic, or subjected to pressure, or to gouty, rheumatic, or syphilitic deposit, besides many others, which are set aside, it is to be feared, by the mere use of the bad name for the disease. If men would but reflect that the use of a functional name—a name like *paralysis*, derived from alteration of function (lately, to be sure, we have had the name *paresis* re-introduced to our notice) or *neur-algia*—implies a darkening of counsel often without wisdom, and is at best but a stop-gap till the true nature of the condition is discovered, there might be some hope for us, and we might in time arrive at a knowledge, not only of what is the part affected, but also of what is the condition of the part, and what it is that has affected it. But, so long as functional names pass current as names of diseases, the art and science of medicine cannot advance. Chorea, hydrophobia, etc., are examples of names to which these remarks are applicable; and many others will suggest themselves.

One of the merits claimed for the classification whose basis I have thus ventured to lay down is, that no new disease can be discovered whose place is not already theoretically determined by the considerations advanced. In fact, the classification is so complete (theoretically), that no new disease can come on it as a new discovery, so far as its place is concerned in the system of classification; for every possible disease must fall into the subkingdom of disease and class, according as dependent on organic or inorganic causes. Then the genus can be readily discovered when it is determined what is the part affected, while the other characters determine the species, variety, etc. The questions of interest come to be such as these: Is it hyperæmic or spanæmic, if simple; and if specific, or due to organic matter, what is the nature or constitution of the organic matter, and what allied matter will be likely to affect it? Another proof of the value of the classification is, that affections of given organs or systems in the body can be arranged, if acquired, in accordance with its principles.

I will here recapitulate the claims which the classification makes for acceptance: 1. It is on a thorough-going plan, and, therefore, 2. There are no cross-divisions; 3. It is natural, bringing together diseases which are really allied, and not naming mere steps in the process of disease as new diseases; 4. It is inclusive, finding a place for all diseases; and, 5. When a functional name is employed, the question is at once raised, whether we know anything about the condition; which is at least a stimulus to industry and investigation.

BRANDON AND BYSHOTTLES.—Last year, the death-rate in this district was considerably augmented by the mortality from scarlatina, measles, and whooping-cough, which were prevalent in an epidemic form. Measles was responsible for 16 deaths, scarlatina for 29, and whooping-cough for 7, whilst diarrhoea claimed 22 victims; the excessive mortality from the latter disease is attributed, in the main, to improper and insufficient feeding, and to atmospheric changes. Many of the deaths occurred in the third quarter of the year; and Mr. Blackett states: “During this time, we had a condition of atmosphere, as regards warmth and moisture, which not only favoured the decomposition and putrefaction of the articles of food, but depressed the vital powers, poisoned the blood, and doubtless contributed to the mortality from diarrhoea and the other prevalent diseases of the district.” The sanitary condition of the district was well looked after, and many improvements were made; but this part of the work suffers in consequence of the absence of any satisfactory record of the proceedings of the sanitary inspector.

TEN YEARS' SURGERY IN THE KILMARNOCK INFIRMARY.*

By JOHN C. M'VAIL, M.D.

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.,† 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 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 appear-

* Being a paper read at the Cambridge Meeting of the British Medical Association.

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

ance 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 or 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, and 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 reapplied over the blood. On April 7th, it was redressed. 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 $\frac{1}{3}$ " 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.

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.	Number.	Died.
I. Major compound fractures ...	27	0 or 0 per cent.
II. Injuries ...	145	4 or 2.7 "
III. Primary major amputations (double) 3	3	2
IV. Primary major amputations (single) 25	25	6 or 2.4 "
V. Secondary major amputations 54	54	2 or 3.7 "
VI. Other operations... 160	160	2 or 1.2 "
VII. Burns ...	49	2
VIII. Abscesses... 179	179	3
IX. Ulcers ...	181	0
X. Diseases of bones and joints ...	68	2
XI. Other cases ...	9	2
Total.....	900	25, or 2.77 "

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

* 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.

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	Thigh	19	18	1
Leg	5	5	0	Leg	15	15	0
Ankle	16	15	1	Ankle	9	8	1
Shoulder ...	1	0	1	Foot	5	5	0
Arm	6	6	0	Arm	5	5	0
Forearm ...	8	8	0	Forearm ...	1	1	0
Total ...	62	59	3	Total ...	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 vertebrae may be opened by free incision, a drainage-tube introduced, strict 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 completeness 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 10½ years, giving a mortality in cases liable to blood-poisoning of 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 7 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 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 open 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 numbered'. 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 excisions 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-sciatic 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.

PULMONARY PHTHISIS TREATED ANTISEPTICALLY.*

By W. WILLIAMS, M.D., M.R.C.P.,
Physician to the Royal Southern Hospital, Liverpool.

THE use of inhalations, and even of antiseptic inhalations, in the treatment of lung-disease, dates from no recent period: remedies of various kinds thus employed are spoken of by very early writers. It would, however, be beyond the scope of my paper to attempt to trace from the earliest records to the present time the gradual development which this subject has undergone. My object rather to-day is to lay before this meeting certain clinical facts which I have gathered while making an endeavour—with what success you will be able to judge—to bring the principles of Professor Lister's antiseptic method to bear upon the treatment of cavity or abscess of the lung. It is not so much, then, to the impregnation of the inspired air with vapour, as its purification, that I wish to draw attention.

Before entering upon the subject before me, I will make a very few

remarks upon some of the pathological changes which lead up to the disease in question.

Unlike acute pneumonia, from which recovery is, in favourable cases, complete, chronic or subacute inflammation of the lungs, in whatever way it may arise—whether as the relic of a previous acute attack, or of an attack of catarrhal pneumonia, or as the result of embolic arrest in the pulmonary capillaries (a view of the causation of phthisis at present in some favour)—tends towards the changes in the lung which are the precursors of phthisis, or, at all events, of some of the more chronic varieties of this disease. Accompanying it are found the same histological changes that are associated with this process elsewhere—a migration of leucocytes takes place, to invade all the pulmonary structures; the blood-vessels are surrounded, compressed, and their efficiency as circulating channels is damaged; the smaller tubes are, in their turn, similarly affected; while the alveolar walls are themselves invaded, thickened, and suffer a loss of elasticity. These, the immediate effects of inflammation, are aggravated to the utmost when the inflammatory products undergo the ultimate connective tissue transformation, with subsequent contraction and consolidation. This change, however, except towards the circumference of the diseased spot is, we are taught, by no means that which invariably takes place; much more frequently, towards the centre of the patch, the tendency will be to supuration and abscess, and the advent of this result will no doubt be hastened or postponed, according to whether the particular case has the acute or chronic characteristic most developed; but, an abscess once established, systematic infection, with rigors, fever, sweats, rapid wasting, and, what is of far greater importance, the setting up, by means of emboli disseminated by parts already affected, of foci of similar disease at a distance in the same, or in the opposite lung, are liable to take place. This is a mode of ingravescence which undoubtedly prevails, and, indeed, forms the principal features of most, if not all, cases of advanced phthisis; and that the study of it forms the surest guide to successful treatment is, I think, no isolated opinion. The patient, although he may have every possible attention—the best of nursing, the most nourishing of diets, given with the most approved regularity—cannot possibly derive the benefit which would, under more favourable circumstances, be secured him by such means, so long as suppurating cavities containing septic pus are allowed to exist in the lungs, constantly exercising their pernicious influence on the blood, preventing even the proper assimilation of the nourishment of which he stands in so much need.

The surgeon, with the resources at present under his command, has no difficulty in obviating the occurrence of the above untoward contingencies; and it will be my endeavour to show with what success I have been able to employ in the treatment of cavities in the lungs the means all but infallible in their application to external wounds.

It is a principle of treatment now universally recognised, that an abscess must be freed of its contents, kept empty by free drainage, and insulated or protected by antiseptic media from the septic influence of the surrounding atmosphere. These conditions being duly fulfilled, experience amply proves that any constitutional disturbance which has already appeared may very well be allowed to take care of itself, as under these circumstances the local lesion will quickly cease to be anything more than a local lesion.

Free drainages from abscesses or cavities in the lungs is undoubtedly in by far the majority of instances not to be secured; we know that they owe their most characteristic features of being ripe sources of systemic infection, or septicæmia, to the fact of their contents being retained while exposed to the septic influence of the air breathed; and the partial discharge that does take place is but periodically produced by the compression which the lung experiences during coughing—a method of evacuation that suggests to one's mind an attempt being made to cure the abscess by squeezing out the contents instead of providing, in addition to antiseptic protection, an efficient opening for a spontaneous and thorough drainage. For this reason, it will appear that all the conditions favourable to the complete carrying out of the Listerian method do not ordinarily exist here. One essential to the system—free drainage—we have seen to be frequently absent; but while admitting the full significance of this fact, we are, I think, bound to confess that the condition which is applicable is scarcely the least important of the two. No one, for instance, would deny antiseptic protection to a suppurating cavity because he was unable to empty it; and simply for that reason, would not a suppurating cavity in such a state, and with the risk of septicæmia which especially attaches to such a state, rather call for this guard against by far the worst accident that can arise?

From the time when, more than two years ago, I first attempted to bring the antiseptic system to bear upon chronic phthisis, I have become more and more convinced that it is the only treatment which promises to fulfil all the requirements of these cases.

In the ordinary application of Professor Lister's system, the fact is

* Read before the North Wales Branch.