remarkably free from this the bane of surgery. And for this improvement, there is no doubt that we are mainly indebted to our convalescent wards, the large, well-aired rooms which have lately been built at the top of the hospital. These convalescent wards I consider to be of the utmost use, not only to the patients who are thus enabled, in all weathers, to get out of their own wards; but also to the patients who may still be obliged to remain in bed. The general ward is relieved of a certain number of patients during a great part of the day, and both sets of patients thus have a purer atmosphere to breathe.

In the general treatment of purulent infection, the main features are that the strength should be kept up in every way, and the nervous irritability allayed. Rum and milk in the early morning, strong animal broth from time to time, and stimulants, wine or brandy, according to circumstances; an opiate at night, and sometimes during the day: such are the remedies which I have found answer best in purulent infection. I cannot say that I have found medicines, save opiates, to be of any use in this terrible disease. I have seen all and every kind of medicine fairly tried, and the patients have died; and I have seen even bad cases—cases in which the internal organs have been seriously implicated—get well under the treatment which I have just mentioned. The patient must be carefully nursed, and the stimulants and support given at stated intervals, and in quantities measured according to circumstances.

And locally, the abscesses should, as a general rule, be opened as soon as possible; but in dealing with joints, this rule requires some caution, for in practice you will, now and then, meet with cases in which there may be great pain, and swelling, and even redness of the skin, on the side of, or around, the joint, with marked effusion in the joint itself, and yet all these symptoms may subside; the fluid disappears, and the joint is, in the course of time, more or less completely restored. I have seen this in three or four instances about the knee, in which there remained stiffness and even contraction for a time, but in the course of a few months the joint was as supple as ever, and has remained so.

A GOOD EXAMPLE. The practice of salting the streets of New York after every snow storm, to hasten the melting of the snow, is now forbidden by law. While it was practised, the streets were not only ankle deep with water, but this water was rendered intensely cold by the mixture of salt. Great injury resulted to the hoofs which travelled on these streets, many losing their horses as a result of the constant exposure. Children attending the public schools were very liable to have their shoes saturated with this brine, and severe colds were the consequence. As a sanitary measure, this action of the Common Council is worthy of all imitation. (*American Med. Times*).

SUICIDES. In the year ending September, 1861, 103 cases of violent deaths were entered on the Scottish registers as cases of suicide; giving the proportion of 34 suicides in every million of the population. For England the last return of suicides seems to be for 1840, and in that year the ascertained suicides were in the proportion of 57 in every million of the population. In Sweden, from 1806 to 1830, the average annual number of suicides was in the proportion of 41 suicides in every million of the population. In Prussia, in 1841, the suicides seem to have been in proportion of 109 in every million of the population.

Original Communications.

REPORT ON VACCINATION AS PRACTISED AT THE LIVERPOOL STATION OF THE NATIONAL VACCINE ESTABLISHMENT.

By A. B. STEELE, Esq., Surgeon to the Blue Coat Hospital, and to the Ladies' Charity; Member of the National Vaccine Establishment; and Teacher of Vaccination appointed by the Privy Council.

[Read before the Liverpool Medical Institution.]

[Concluded from page 253.]

The station selected in Liverpool was the Vaccine Institution connected with the Ladies' Charity, originally established by the late Mr. Park about fifty years ago, and which has been kept up in a state of efficiency ever since.

Gratuitous vaccination is here afforded to the children of those women only who have received the aid of the charity, who are ineligible for relief a second time if they fail to bring their children to the institution to be vaccinated within three months after birth. About 1000 vaccinations are performed annually. A register is kept, showing the precise result and the source from which the lymph is taken in each individual case. About 400 charges of lymph on ivory points are forwarded to the National Establishment in London every week. The vaccinating days are Mondays and Fridays. The remarks which follow must be considered, for the most part, to apply to the practice adopted on Mondays, that being the day to which my observations are principally directed.

The mode of vaccinating differs somewhat from that commonly adopted, and is in accordance with the recommendation of Mr. Marson. The following is the plan of proceeding: The arm to be operated upon is firmly grasped by the left hand of the operator, so as to make the skin tense; then, the lancet being already well charged, with the right hand, the lymph is introduced by a valvular incision from above downwards; so managed that the fluid may gravitate into the wound. Five such incisions, about half an inch apart, arranged in the form of the five of diamonds, are made without re-charging the lancet, which must be very sharp, as failure, more or less complete, is sure to result when the lancet used is not in good order. No importance is attached to the amount of bleeding, which, even when considerable, does not interfere with the success of the operation.

One advantage of this method is that, when carefully and successfully performed, it gives more uniform and characteristic results than any other plan. Each puncture produces a separate perfect vesicle; the five constitute a miniature eruption of *vaccinia discreta*, more strictly typical and more clearly exhibiting the normal course of the vesicles through the several stages of development, than when the lymph is introduced by "scratching," or by several minute punctures in close proximity, so that two or more vesicles are blended together, producing a confluent form of eruption, which, to a certain extent, destroys the characteristic appearance of the vesicles.

It is not for a moment contended that the particular manner of operating just described affords a greater degree of protection than any of the numerous other methods which have, from time to time, been recommended and adopted. Much latitude may well be allowed in this respect, provided the all-important object be kept in view; namely, that in every case a sufficient number of perfect vaccine vesicles are produced, which

shall afford conclusive evidence of having passed through the normal course of development, and which shall leave behind them well defined typical cicatrices. The particular mode of introducing the lymph must, in a great measure, be left to the taste and discretion of the operator.

One circumstance in connexion with this part of our subject cannot be too strongly impressed upon the minds of all who are engaged in vaccination; namely, that imperfect vaccination, so far as the individual subjected to it is concerned, is an evil which cannot be entirely remedied. If a child be vaccinated in such a manner as to give rise to an abortive form of vesicle, which does not go through its course of development, not only is the individual left in an unprotected state as regards small-pox, but the system is rendered insusceptible to the influence of the vaccine virus; so that, for a considerable period at least, any subsequent attempt at vaccination fails to give satisfactory results.

The five punctures made in our mode of vaccinating are intended to ensure the development of not less than four vesicles, that being the smallest number which, as a general rule, may be considered to afford full protection against small-pox. I would direct your attention to the following statistical evidence of the different degrees in which persons vaccinated in different ways will be safe against death by small-pox, if they happen afterwards to contract it; founded on information given to the medical officer of the Privy Council, by Mr. Marson, surgeon of the Small-Pox Hospital, as the result of his observations made during twenty-five years in nearly six thousand cases of post-vaccinal small-pox. It appears to me so clear and so conclusive as to be deserving of the more serious consideration of all vaccinators.

Patients admitted with Small-pox.

	Deaths per cent.
Stated to have been vaccinated, but having no cicatrix.....	21½
Having one vaccine cicatrix*	7½
Having two vaccine cicatrices+	4½
Having three vaccine cicatrices.....	1½
Having four or more vaccine cicatrices	¾
Unvaccinated patients.....	35½

In the selection of the sources of lymph, extreme caution is observed, taking it from those cases only which are typical, and which possess all the characteristics of normal eight day vesicles; rejecting those, on the one hand, which are retarded, being small, and giving no indication of the commencement even of an areola, and even more cautiously avoiding those, on the other hand, in which the areola is unduly developed, or which present irritable appearance, or the slightest indication of having run an unduly rapid course. "Rubbed arms", as they are called, are also invariably rejected as sources of supply, even though one or more vesicles may have escaped injury. It has been shown by Mr. Marson that this "rubbing", in almost every instance, is due to some source of irritation in the system of the child, very frequently an herpetic or other cutaneous eruption so slight as to have escaped notice; in others, it is attributable to derangement of the secretions or excretions. The vesicles under these unfavourable states of the system assume an irritable itching condition, which induces the rubbing. The lymph taken from such arms has been found to propagate similarly irritable vesicles, or

in other respects has failed to pass through its course satisfactorily.

The lymph used at this station, as stated on a former occasion, was originally obtained from Jenner, and has been uninterruptedly employed ever since, and still possesses all its original infective power; thus confirming the statement of the National Vaccine Board, that "vaccine lymph does not lose any of its prophylactic power by a continued transit through successive subjects, and that it is a fallacy to predicate the necessity of resorting to the original source of the cow for a renewed supply."

The opposite opinion, namely, that vaccine lymph must naturally and inevitably become deteriorated by lapse of time, has, nevertheless, many supporters; and probably owes its origin to what, at first sight, appears to favour that view. Lymph direct from the cow is very energetic in its action on the human system; this intensity gradually decreasing for several successive removes from its original source. This intense action, however, is simply the effect of transplanting the disease from brutes to the human subject; and the subsequent decrease in its activity is not progressive, but ceases after a few removes, when the disease has become, as it were, humanised; it then assumes a definite and typical form, from which there seems to be no further tendency to deviate, so long as surrounding circumstances are favourable to its proper development.

Other diseases, such as syphilis and small-pox itself, lose none of their activity or infective power in successive transmissions through many subjects; and it is probable that vaccinia is no exception to this law. As an illustration of this point, the following circumstance is, perhaps, worth recording. Quite recently, I obtained from Mr. Ceely of Aylesbury some lymph which he had taken from the cow six years ago, and which, he assured me, had lost none of its activity; this lymph I used side by side with some from the old stock from the Liverpool Vaccine Institution, which cannot be less than fifty years old; and I could detect no appreciable difference between them in reference to the activity of their infective power.

One thing is certain, and has been illustrated here and at other stations, and it is this, when lymph appears to be losing its activity, careful observation will almost invariably trace the failure to some preventable cause; and the same lymph, by judicious management, may be gradually restored to its original efficiency. The vaccine fluid is very subtle, easily influenced by many apparently trivial circumstances, and requires nice and delicate management to preserve it from deterioration.

Observations at this institution fully bear out the almost unvarying testimony of experienced vaccinators, as to the utter groundlessness of the idea so prevalent amongst the non-professional portion of the public, and occasionally, although rarely, entertained by medical men, as to the alleged transmission of scrofulous, syphilitic, and other constitutional taint, by means of vaccination. Of all the objections which have been urged against vaccination, and by which its extension has been obstructed and opposed, not one, perhaps, has had a more powerful effect than this notion that other diseases can be, and frequently have been, introduced into the system by the inoculation of vaccine lymph. The following extract from a local newspaper is a specimen of the popular opinion on this point. It is part of the speech of a member of the Board of Guardians, who are entrusted with the arrangements for providing for public vaccination.

"I believe," says this learned guardian, "vaccination, as it is at present performed, to be nothing more than a mockery, a delusion, and a snare. Twenty unfortunate infants may be inoculated from one unhealthy child, and what is the result? In place of a preventive against small-pox, frightful skin diseases are engendered, which,

* Among cases in which the one cicatrix was well marked, the death-rate was 4½. Among cases in which it was badly marked, the death-rate was 12.

+ Among cases in which the two cicatrices were well marked, the death-rate was 2½. Among cases in which they were badly marked, in 7½.

in several cases within my own knowledge, have rendered the child hideous for months, incurable, or only cured at the expense of life itself."

It is only a short time since we read with grief and astonishment, statements made in the House of Commons by a member of our own profession, denouncing the discovery of the immortal Jenner in terms as illogical, unscientific, and as superstitiously prejudiced, as those of the Poor-law guardian just quoted. I have reason to know that amongst the profession in this town there are some who, although fully appreciating the value and importance of vaccination, and whose opinions are entitled to every consideration, nevertheless, are not altogether satisfied upon this point; nor should we, I think, be surprised to find this to be the case, as it must be admitted that appearances often favour the idea. Most medical men, especially those who practise extensively amongst the poorer classes, will remember instances in which patients are brought to them suffering from various diseases supposed to be produced by "bad matter." This notion, erroneous as I believe it to be, frequently proves a source of much annoyance and anxiety to a conscientious medical attendant; while, at the same time, it is injurious to the cause of vaccination, by lessening the confidence of the public in its safety. It is, therefore, highly desirable to remove, if possible, any doubt or misgiving which intelligent practitioners may entertain upon the subject. It would be impossible, in the limits of this paper, to give even a condensed account of the conclusive evidence which experiment and investigation have brought to bear upon this disputed point. I would earnestly recommend those interested in the question to peruse carefully the interesting and important statements given by Mr. Simon in his report on this particular branch of the subject; it is there fully and dispassionately discussed, and, to my mind, as satisfactorily disposed of as can be expected in any case upon which negative evidence alone can be brought to bear.

I may, perhaps, be permitted briefly to state one conclusion to which Mr. Simon arrives; namely, that lymph taken from a true Jennerian vesicle at the proper period of its development is incapable of producing any other disease except cow-pock; and this fact, says Mr. Simon, rests upon "one simple mass of evidence, which, to my mind, seems conclusive. It has been proved, on a large scale, that vaccine lymph taken from persons actually suffering from small-pox conveys to those who are vaccinated with it no other than the vaccine infection." (*Blue Book*, p. 68.) In reference to scrofula and most skin diseases, it is well known that, even when for experiment their specific discharges and other products are deliberately inoculated on the healthy, they are absolutely incommunicable by contagion; and it is inconceivable that the vaccine lymph, even if it could include these products, would alter the essential condition of their nature. As to those diseases whose specific products are infectious, the question arises whether the constitutional existence of such diseases can qualify the contents without modifying the characteristic development of a true Jennerian vesicle; and this question has been conclusively answered in the negative by experiment on an extended scale. He sums up his voluminous statements by observing, "Obviously, then, one, at least, of two conclusions is inevitable. Either it is the case that, even with reprehensible carelessness as to the source of lymph, vaccination (so long as, in any sense of the word, it is vaccination) cannot be the means of communicating any second infection; or else it is the case that, in the world of vaccinators, care is almost universally taken to exclude that possibility of danger."

The mode of preserving lymph adopted here is almost exclusively by charging ivory points and carefully drying them. In this state, it is probable that vaccine lymph will retain its infective power as long as in any

of the various methods which have been suggested. It has, as is well known, been successfully practised for many years by the National Vaccine Establishment, and distributed to all parts of the world. It is very convenient for transmission; and is well adapted for the purpose wherever a large supply is required, and where it becomes, in consequence, an object to economise the lymph, and the time occupied in obtaining it. A larger number of effective charges can be taken from a given number of vesicles by means of the ivory points than in any other way.

The very prevalent custom of preserving lymph between two small squares of glass is attended with this serious objection that, as the lymph is thus kept in a moist state, it is, like all organic fluids, extremely liable to undergo decomposition, and then, instead of producing a vaccine vesicle, it is liable to be followed by the injurious effects of a putrid secretion. Fatal instances of this unfortunate result have been met with by Mr. Marson. The same objection applies even more strongly to the plan of keeping lymph upon the glass tongue of the stoppered bottles used for the purpose. In warm weather, a few hours will sometimes suffice to cause the decomposition of the lymph; and the variable and uncertain period during which it remains unchanged, only adds to the danger. With the hermetically sealed glass tubes of Dr. Husband, it is possible that the fluid may retain its properties for a much longer period; but with them there is a certain risk, especially if, by oversight, the tube should not be perfectly closed. In the dry state, as on the ivory points, the lymph may lose its power of infecting by lapse of time, and cause disappointment; but the risk of mischief from putrescence or decomposition appears to be altogether avoided, which is, undoubtedly, the greater evil of the two.

INTRACTABLE CASE OF NEURALGIA CURED BY OXYGEN.

By JOHN HOOPER, M.D., M.R.C.P., Hoddesdon, Herts.

I READ with much attention and satisfaction Dr. Birch's excellent paper on Oxygen as a Therapeutic Agent; giving the great experience he has had in the treatment of cases with this remedy. Moreover, I am convinced that nothing contributes so much to the improvement of health generally, to the augmentation of the power of enduring mental and physical exertion, as removing to such localities as are deemed healthy; viz., abounding in oxygen. It hence appears an *argumentum ad judicium* that, by inhaling a larger amount of oxygen, especially upon a graduated scale, in proportion to the capability of the patient to bear it, many diseases might be cured, which are at present considered incurable. We have heard much lately of the brain-power being sustained and improved by alcoholic stimulants; but will not this be attained more efficiently by inhaling atmospheric air, exuberant in oxygen? What enabled Sir Francis Head to endure such an amount of exertion in his gallop across the Pampas, South America? What caused such exhilaration of spirits, and such an amount of endurance without fatigue? Clearly, the advantage of breathing an atmosphere free from contamination, abounding in oxygen. It has been observed by the celebrated Liebig, that vital power is dependent upon the mutual action of oxygen and the elements of food.

About twenty-five years ago, I had an opportunity of witnessing the successful effect of inhaling oxygen in a case of asthma.

J— L—, aged 55, had for many years been a martyr to asthma before this attack, under which he was then labouring in the year 1835-36, when it was attended with extreme danger. In one of the morning paroxysms, he was thought by all around him to be