VACCINATION.

ADVICE ON THE NECESSITY OF VACCINATION; THE VALUE OF VACCINATION; THE TESTS OF SUCCESSFUL VACCINATION; HOW OFTEN REVACCINATION SHOULD BE DONE; THE QUALITY OF VACCINE; THE BEST WAY TO USE VACCINE; HOW TO PREVENT AND EXTERMINATE SMALL-POX; THE CONSTRUCTION OF SMALL-POX HOSPITALS, &c.

ISSUED GRATUITOUSLY BY THE

NORTH CAROLINA BOARD OF HEALTH.

RALEIGH:

ASHE & GATLING, State Printers and Binders.

Presses of EDWARDS, BROUGHTON & Co.

1882.

VACCINATION.

ADVICE ON THE NECESSITY OF VACCINATION; THE VALUE OF VACCINATION; THE TESTS OF SUCCESSFUL VACCINATION; HOW OFTEN REVACCINATION SHOULD BE DONE; THE QUALITY OF VACCINE; THE BEST WAY TO USE VACCINE; HOW TO PREVENT AND EXTERMINATE SMALL-POX; THE CONSTRUCTION OF SMALL-POX HOSPITALS, &c.

ISSUED GRATUITIOUSLY BY THE

NORTH CAROLINA BOARD OF HEALTH.

RALEIGH:

ASHE & GATLING, State Printers and Binders.

Presses of EDWARDS, BROUGHTON & Co.

1882.

VACCINATION.

Advice from the North Carolina Board of Health on the Necessity of Vaccination; the Tests of Genuine Vaccination; and the Quality of Vaccine.

No argument is so potent in influencing the people to vaccinate, as the presence of small-pox. Even those who calmly discuss the question when at a distance from the disease, and are inclined rather to take issue against the preventive power of vaccination, easily take the benefit of the doubt, when a case of small pox comes close to them, and procure vaccination without delay. This is deemed an opportune time to issue a circular of warning and advice, on the subject of VACCINATION, because of the appearance of small-pox in several States. Only a few cases are known to exist in one locality in this State, but its prevalence elsewhere, and the facility of communication of remote towns with each other, makes it highly probable that it will spread to a considerable extent.

THE VALUE OF VACCINATION.—Vaccination, if done with genuine fresh vaccine matter, is absolutely protective against small-pox. The hundreds of physicians and nurses who have been repeatedly exposed to small-pox, and have time and time again escaped from having even varioloid, attest its potency. In countries where compulsory vaccination has been enforced, the number of deaths from small-pox is insignificant. American opinion is little divided on the efficaciousness of vaccination, and it is not deemed necessary to enter into an argument on the subject.

It is well known, though, that during the war and for a few years after the war, the protective power of vaccination was very seriously doubted by many, and dreaded by a great many more, because it seemed that the dangers of vaccination were as much to be dreaded as small-pox. It may be necessary, therefore, to explain the reasons of this eclipse which darkened the brilliant reputation of this great prophylactic, for it is still fresh—painfully fresh—in the minds of some.

The source of vaccine in this country was very variable and uncertain up to the year 1870. Vaccine crusts of *humanized vaccine*, (that is, vaccine procured by inoculating persons from arm to arm during many generations) furnished the entire country with virus. Those persons who paid the most attention to its propagation, observed the utmost care that vaccine cultivated upon the arms of the healthiest children should only be employed and distributed as seed. When the war broke out, and large numbers of soldiers were brought together in camps, it became necessary to vaccinate and revaccinate the most of them. There was no known adequate source of vaccine at the time. In the Southern army anything went for a vaccine scab. Every soldier and every soldier's wife was a vaccinator. Without any knowledge of the condition of health of the person furnishing the scab, and without any knowledge of how a genuine scab should look, so-called vaccine matter was selected for seed, which was nothing but dried pus, and spurious vaccination was scattered broadcast. The exceedingly filthy sores produced by this matter was popular evidence that the vaccination had "taken" very well, and served to recommend it to neighbors who had not had the good fortune to be inoculated with it.

The spread of spurious vaccine among the soldiers and citizens of the Confederacy caused serious trouble to very many, several persons losing their arms, and many being sadly maimed by it, and of course none of them were pro-

tected by it. Indeed the so-called vaccination was practically nothing but the transplantation of purulent "matter" from one person to another, yielding crops of foul ulcers, and skin diseases of many degrees of severity from contageous porrigo to syphilis.*

The two causes, therefore, which brought vaccination into disrepute, were the ignorant selection of seed, and its transplantation from one bad soil to another, until it at last bore no resemblance to the original seed planted and many times was fraught with the severest calamity to the patient.

Fortunately now we are enabled to clear up all this history of vaccine disaster, thanks to the unremitting zeal of Dr. Henry A. Martin, of Boston.

Dr. Martin had been a student and propagator of vaccine for many years previous to the war, but the extensive field of study which the army put within his reach, had impelled him toward a solution of the difficulties he had encountered in his army experience of procuring reliable vaccine. It is not necessary to relate the whole story, but suffice it to say that he conceived the idea of importing the natural, spontaneous virus, which had made its appearance at Beaugency. This was successfully done in 1870, (Sept. 23) and from that day can be dated the beginning of a radical reform in the practice of vaccination, a reform that can hardly be overestimated.

The practical results which issued from the introduction of *animal vaccine* † may be summed up as follows:

1. *Vaccine has been restored to all of its original activity and purity.*

2. *As it is propagated from one healthy heifer to another, by in-*

---

* Dr. Joseph Jones, of New Orleans, by direction of Surgeon General Moore, of the Confederate States, investigated spurious vaccination, and found that the foul ulcers called vaccination were due to the spurious matter transplanted from one scorbutic soldier to another for the most part.

† Animal vaccine is a term applied to vaccine directly from the cow.

oculation, the seed is propagated in its original soil, and does not degenerate.

3. *It can be said that* ANIMAL VIRUS, (*unlike the virus obtained from the human subject,*) *never imparts any of the diseases* (*such as erysipelas, syphilis, porrigo, &c., &c.,*) *that humanized virus has been known to communicate.*

4. *That animal virus in the hands of experienced propagators can be supplied in quantities equal to the greatest demand, at reasonable notice.*

5. *That it is possible to procure enough original virus direct from the heifer to avoid the harmful practice of tapping forming vesicles, from which to inoculate others.*

6. The expensiveness of the outfit necessary to carry on successfully the propagation of animal virus is so considerable that it is more likely that but few persons will undertake to propagate it, and that the warrant of the genuineness of virus these propagators are able to give is worth something.

7. The proportionately large number of cases of revaccination which take shows the potency of this virus, as compared with humanized virus, of many generations of attenuation.

Having explained how the degeneration of vaccine matter took place in the South during the war, and having pointed out the regeneration of the virus and its restoration to its pristine purity, clearing up all the doubtful points raised in the minds of the people, we will next consider

WHAT IS A SUCCESSFUL VACCINATION?

It is a matter of the utmost importance that there should be some definite meaning attached to the phrase "successful vaccination." Many ask the question anxiously about themselves. We answer, that the best evidence of successful vaccination is *the possession of a good vaccine scar.* This is not absolutely sure but it is the best we have. A vaccine scar from a recent vaccination will be proportionately fresh-

er and more distinct than from a vaccination more remotely done. It should be wheel-shaped, or oval, about the size of a three-cent nickel; it is usually whiter than the surrounding skin; it may be either depressed, with radiating lines; or it may be elevated slightly, except the periphery which is somewhat depressed. The scars from animal virus spoken of above are more sharply cut, larger, with more distinct radiations, and, of course, more conspicuous. The old stock of humanized virus gives us a superficial, small, white, scar, with slight indentations over it, these indentations answering to the follicles of the skin. Really no vaccination is absolutely certain that has not been put to the test, but it is a good criterion to go by that a person in the possession of a clear-cut, well formed vaccine scar, will hardly get the small-pox in an intense degree, even though the operation may have been done many years previously. With animal virus, we frequently get successful vaccinations in the persons of those having good marks, and in cases in which long humanized virus has failed.

It is held in Great Britain and Germany that the number of scars is the best evidence of protection. But this does not hold. For the writer of this has recently seen a German sailor marked by many beautiful and typical vaccine scars, so clean cut that it was possible to get an impression in wax from them, but who yielded a good vaccination from animal vaccine, the interval from the first to the second vaccination being fifteen years.

The theory that the protective influence dies out every seven years has no foundation.

HOW OFTEN SHOULD ONE BE VACCINATED?—The prudent man always takes the benefit of the doubt, and before running the risk of small-pox has recourse again to revaccination. Experience shows that an infant vaccinated at the usual time, from two months to one year old, will require revaccination on arriving at puberty—say from twelve to sixteen years of age. Some will become susceptible be-

fore that, but many more will resist all future attempts at revaccination, especially if the primary vaccination was thorough. It is better to be revaccinated on every appearance of an epidemic. There is no greater risk during an epidemic, than at any other time, of having bad results from vaccination. It is best, as a general rule, to vaccinate a child at from two to twelve months, revaccinate at puberty, and then be guided by the character of the scar whether it is further necessary, unless an epidemic approaches; then revaccinate without delay. While it is a fair inference that a person susceptible to vaccination is also unprotected from small-pox as long as vaccination will take, it is not absolutely certain that this is so.

A PRIMARY VACCINATION.—It is very necessary that the first vaccination,—the primary vaccination,—should be done with great care. A failure in the first attempt casts doubt on all subsequent operations, and dangerously misleads. We often hear persons declare that they were vaccinated, whereas, when we come to examine their arms we discover that the scar or mark is not as it should be, but still the person is relying upon its protective power because the vaccination was done during infancy, and the tradition about it may be that it was so good that some doctor desired the scab. A primary or first vaccination should be exhibited to the physician who performed the vaccination, during the next six or seven days, for his inspection and approval. If the resulting vaccination is not satisfactory, it should be repeated without delay. So very few infants are really insusceptible, that a failure suggests forcibly that the operation was not thorough, or that the vaccine used was not active.

A REVACCINATION.—Persons vaccinated for the second or third time, *should be vaccinated with animal virus*, for if humanized vaccine is used the chances of getting a genuine result are not so good. Revaccinations are done generally in times of alarm, or upon persons about to travel, or upon

persons about to join a life insurance society. In either case a good vaccine vesicle will be very desirable, and the operator will get considerable credit for making it "take" well. Successes will be accomplished in far more than half the vaccinations done with animal vaccine.*

THE USE OF SCABS OR CRUSTS.—It is still very much the custom to use vaccine scabs or crusts taken from the arms of vaccinated persons. This method was introduced by Dr. Boyce, a Scotch physician, and has served a most admirable purpose for half a century. A vaccine scab is composed of dried lymph, pus, epithelium, and some trace of blood. If we give credence to the dangers pointed out by the most eminent surgeons as to the danger of septicæmia or blood-poisoning from the inoculation of purulent matter, and consider how many times crusts are used that have been exposed to heat and moisture sufficient to set up partial decomposition, and furthermore remember how many physicians dissolve or make a paste of these crusts and carry them between glass pieces and so put the "matter" in a favorable state for alteration and decomposition, the wonder is that we do not see a great many bad vaccinations from "scabs."

There is certainly a considerable degree of danger from this source, as we have already mentioned in account of that sort of vaccination during the war, but it would still be by far the best vaccination we could obtain, had not the cultivation of vaccine been reduced to a rational system by Dr. Martin. In the hands of a careful physician, vaccine from one to ten removes from the heifer will give excellent results. It is cheaper; the resulting vesicles are by no means to be despised.

But we surmise that few persons who are well informed about the possible dangers of vaccination from a scab, and the absolute freedom from danger by the use of animal

*The successes reach nearly 70 per cent.

virus, would not greatly prefer the latter when it could be obtained.

We take this occasion to say that a vaccine crust should not be prepared for vaccination in larger quantities than are needed for immediate purpose. That it should never be moistened with saliva, but always with pure water or glycerine. Glycerine has the advantage of being a preservative fluid.

THE USE OF QUILLS OR IVORY SLIPS.—Quills prepared by scraping or boiling, and lancet shaped ivory slips, are smeared with vaccine virus in a thin film, and in this way it is preserved very well for a longer time than when the fluid is collected in glass capillary tubes. In this way the vaccine fluid dies rapidly, and is thus preserved ready for use. The great advantage of the ivory point is that it is shaped in such a way as to be used as a lancet, and is so cheap that it may be thrown away after once using. Its use avoids the risk from using a dirty lancet, and leaves no room for the patient to charge the physician with carelessness if any unusual course follows the vaccination. The ivory slip charged with vaccine directly from the cow is used to complete the entire operation of vaccination, enabling the physician to assure his patient that the pedigree of the vaccine is good, and that the instrument was never before used on any one.

OTHER METHODS.—The old fashion of impregnating threads with vaccine virus, and inserting it under the skin is no longer used, although it is a good plan if we did not have superior resources.

A method employed by President Thomas Jefferson (see Dr. Martin's excellent historical account of Jefferson as a vaccinator in the January number (1881) North Carolina Medical Journal) was novel, and may be turned to good use now where animal virus cannot be had. Prepared crusts or threads or quills were put in a bottle and hermetically sealed, and this bottle placed in a larger one containing

water, and the whole tightly corked. We have not spoken of all the devices for the preservation of vaccine, but enough has been said to convince the reader that vaccine virus must be kept with care, in order for it to produce a good result.

How to Prevent and Exterminate Small Pox.

Vaccination in infancy, revaccination at puberty, and where there is not a distinct vaccine scar, revaccination on the importation of small pox into a community is the well proven plan to prevent small pox. None should be allowed to escape the vigilance of the health officers. The greatest danger in every community is from the more ignorant, and consequently the more prejudiced classes. Compulsory vaccination should be attempted by every town, village and hamlet. It is cheaper to furnish vaccination at a great expense than to allow one case of small pox to get into a community. The city of Wilmington has spent as much as five hundred dollars a case for the care of small pox, and during the epidemic of 1865–'66 as much as $12,000 were expended before we were rid of the vile disease. Thorough vaccination, which was then impossible, would have saved it all.

A lesson of the expeditious management of small pox is fresh in the minds of some of us. Last year a sick sailor came into the port of Wilmington, and three days after he was sent to the Seaman's Home Hospital, (on Dock Street, in a thickly settled portion of the city) small pox broke out on him. At 11 o'clock the disease was recognized. All the sailors, fourteen in number, in the same ward with him, were vaccinated, and in four hours from the time the disease was recognized, the patient was carefully and comfortably transported four miles down the river to the dismantled pest house, with a nurse and provisions, bedding, furniture and medicine necessary for his comfort. Vaccination was promptly done at the expense of the city, and quietly and

without panic or mishap, the disease was stifled in the very outset. No other case occurred.

This lesson in preventive medicine we like to hold up to the people of the State, to show what can be done by quiet, energetic action. This example also serves to answer the question how can small pox be exterminated?

SMALL POX HOSPITALS.—The best plan for the construction of a hospital for the reception of small pox patients is the pavilion plan. Large tents, with flies, furnished with board floors, warmed by small sheet-iron stoves, fulfils the requirements necessary for the successful treatment of these cases. When the cases are ended, all the material should be destroyed by fire. Small pox patients require well ventilated, cool, airy apartments.

THE DUTIES OF COUNTY SUPERINTENDENTS OF HEALTH ABOUT PUBLIC VACCINATION.—Superintendents of Health are required by law to vaccinate all persons applying, free of charge, and they are also required to vaccinate all persons admitted into jails, poor-houses and work-houses, if they find it necessary. Unfortunately for this demand of the law, no means are provided for the Superintendent of Health by the State, to purchase vaccine. The modest sum of Two Hundred Dollars was asked for, but the last Legislature did not feel able to provide the State Board of Health with this small sum to meet the emergency that is now upon us. The requisitions therefore that have been made upon the Secretary of the Board cannot be filled unless accompanied by the cash. The command made by the State law that "the Secretary of the State Board of Health shall keep a supply of fresh animal vaccine virus at his command" has been complied with, but no thanks to the State of North Carolina for his ability to do it.

It will save the Secretary of the Board some trouble and expense, by replying at this place to the numerous enquiries addressed to him for information about where to get vaccine virus.

There are many vaccine farms in the country. Two in Boston, one in Philadelphia, two at Chambersburg, Pa., one at Fond du Lac, Wisconsin, one at St. Lous, Mo., and perhaps others. We have had experience with vaccine from the *Pennsylvania Vaccine Company, Chambersburg, Pa., and that of Dr. Martin, of Boston, (27 Dudly St.)

ONE LAST WORD OF ADVICE ABOUT THE USE OF ANIMAL VACCINE.—The vaccine directly from the heifer is slower in its course than the old humanized virus. Frequently it does not produce a vesicle earlier than the 5th day, and sometimes as late as the 7th, and the crust is not dropped until from the 21st to the 24th day. It will also be observed that there is greater constitutional disturbance, and that now and then a general eruption will follow.

Caution about the management of the Vaccinated Arm.

There is good reason to believe that a vaccination that runs its course undisturbed, affords the best protection. Vesicles should not be tapped to furnish vaccine for other persons. The vesicle should be protected by a "vaccine protector" (sold in dry goods shops) or by a loosely fitting sleeve, the vesicle being covered with a cloth greased with suet, and all covered with a fold of cotton batting. Sometimes it is necessary to treat the sore resulting after the scab drops. A weak solution of white vitriol (sulphate of zinc) five grains to the ounce, applied several times daily, will generally suffice.

---

*The Pennsylvania Vaccine Company sends out quills, five for $1.00. Each quill will vaccinate two persons. Dr. H. A. Martin & Sons sell seven ivory points for $1.00, or fifteen for $2.00.