THE

BOSTON MEDICAL AND SURGICAL JOURNAL.

NEW SERIES.]

THURSDAY, APRIL 25, 1872.

[VOL. IX.—No. 17.]

Original Communications.

VACCINATION WITHOUT SCAR;

SCAR NOT A TEST OF THOROUGHNESS OR OF IMMUNITY.

Read before the Boston Society for Medical Improvement, Jan. 22d, 1872, by B. E. COTTING, M.D., Associate Member.

In the spring of 1867 (see Boston Medical and Surgical Journal, Aug. 29th, 1867), I read a paper to this Society, the object of which was, in part, to show that thoroughness of vaccination, and the protection afforded by it, depended upon an essential change wrought in the system by the disease; that this change could not be correctly estimated, nor with any exactness, by the size, peculiarities, and other appearances, or number, of the scars; and that, on observed and philosophical grounds, the then apparently prevalent belief in such a test was only a popular error.

As these propositions were somewhat strenuously contested by some members, an opportunity has been sought for ever since to demonstrate them.* At length, after much effort, many disappointments, and the assumption of considerable personal responsibility, such an opportunity has been secured; and the results are sufficiently decisive, it would seem, to remove all doubt in the matter. Although the erroneous idea appears to have been given up pretty generally hereabouts, and, in the present vaccine panic, seems to be wholly abandoned in practice by its former advocates, it is worth while that the question should be settled once for all if possible. If a single case can be found of thorough vaccination with complete immunity without any scar at all, then, however valuable as a proof of previous vaccine disease, the necessity of a scar of particular form and peculiarities to secure thoroughness or immunity is no longer

tenable, and the doctrine of such a test must be abandoned.* Such a case we now have through an experiment devised by myself, and faithfully carried out in its details by Dr. J. Henry Davenport, of this city. I give the account in his own words:—

"The following is a history of the experiment I have performed at your suggestion.

"Nov. 21st, 1871.—*x*, aged about 12 years, a healthy and hearty boy who had never been vaccinated, was obtained for the proposed trial.

"A drop or more of pure virus, from a boy 14 years old on the 8th day of normal vaccinia, was drawn into the long needle-pipe (about two inches long) of an ordinary subcutaneous syringe, which had been tried previously with another drop and its trustiness proved. The outside of the needle was then cleaned with an aqueous solution of carbolic acid (one part to twenty), and carefully washed and wiped off, in order to free it from any virus that might possibly adhere to the outside. The needle, thus cleaned and containing a drop or more of pure virus inside, was passed with an upward direction its full length under the cutis in front of the biceps of the left arm—so that the point of deposit should be as far as possible from the puncture. When thus well imbedded in the areolar tissue only, its contents were discharged. After this, the needle, lying flat under the skin, was turned round over a considerable angle and moved about so as to secure a thorough subcutaneous wiping of the point, and then rapidly withdrawn. No blood followed; and the prick was to be seen only with difficulty.

"Nov. 22d, 2d day.—A slight deep-seated hardness at the point of deposit about the size of a bean, such as follows most

* . . . "A miserable, flat, white speck or two, which no medical man who knows anything of smallpox can regard as protective."—*London Med. Times and Gazette*, February, 1867.

" . . . Unless the characteristic mark of primary vaccination be distinct and satisfactory, it is prudent," &c.—*Circular of York and Lincoln Branch of British Medical Association*.—*British Medical Journal*, March, 1872.

WHOLE No. 2308

* "Cui Bono?"

Truth is weakened by any addition of error.

"Truth will always be more confirmed and extended by a conscientious indication of those points which are hypothetical."—FLEICHTENSBLEN, *Med. Psych.*

VOL. IX.—No. 17

subcutaneous injections of medicine. No indications of inflammation.

"Nov. 23d, 3d day.—Same as yesterday.

"Nov. 24th, 4th day.—No increased swelling. No tenderness in axilla. No loss of appetite. No symptoms of constitutional disturbance.

"Nov. 25th, 5th day.—Swelling (lump rather) is smaller.

"Nov. 26th and 27th.—No change.

"Nov. 28th.—Complains of itching.

"Nov. 29th, 9th day.—Swelling enlarging. The immediate neighborhood very slightly reddened. The blush extends over a space a little larger than a silver dollar.

"Nov. 30th, 10th day.—Swelling as large as a small horse-chestnut; seems deep seated and imperfectly connected with the skin, which is suffused with a blush about three inches long by two wide. Axilla tender. Tongue shows a thin white fur.

"Dec. 1st, 11th day.—Did not sleep well last night. Had headache. Was feverish. Pulse accelerated.

"Dec. 2d, 12th day.—Swelling decreasing. Blush scarcely to be seen. Constitutional symptoms have all greatly abated.

"Dec. 3d, 13th day.—Same as yesterday.

"Dec. 5th, 15th day.—Swelling smaller. Feels soft. Pus was feared to be forming—none formed however.

"Dec. 8th, 18th day.—No material change.

"Dec. 10th, 20th day.—Swelling almost entirely disappeared. *Arm shows no sign whatever of any scar.* Any experienced person would suppose that the boy had never been vaccinated.

"Dec. 30th, 40 days after vaccine injection, x was thoroughly re-vaccinated, and a drop of clear virus put into and allowed to dry in some fresh scratches made by a lancet.

"Jan. 1st, 3d day.—No swelling or itching. The wounds look like any similar cuts a day or two old.

"Jan. 2d.—No change; Jan. 6th, 8th, the same.

"Jan. 11th, 13th day.—Not taken.

["Jan. 25th, 27th day after re-vaccination, x was again re-vaccinated.

"Jan. 27th, 3d day.—Some itching and redness—a sore.

"Jan. 28th, 4th day.—Redness a quarter of an inch in diameter.

"Jan. 29th, 5th day.—No swelling in axilla, nor other constitutional symptoms.

"Jan. 30th, 6th day.—Redness and sore gone.]

It will be seen by this case that, after injection of the virus beneath the true skin,

the vaccine disease progressed as regularly as when introduced in the ordinary way. On the 9th, 10th, and 11th days, there were the areola, swellings, and constitutional symptoms in due order. At one time, especially on the 15th day, there seemed to be some fluid present—as though there had been a subcutaneous vesicle, passing through the purulent stages. By the 20th day, the disease had completed its "series of processes;" but left *no scar*, nor trace behind.

That there was complete immunity against subsequent vaccine disease was clearly shown by the thorough re-vaccination twenty days afterwards, or forty days after the first subcutaneous vaccinal puncture.

[Since this paper was read to the Society, a second re-vaccination, twenty-seventh day after the first, having the usual appearances of ordinary re-vaccination, pustule, redness, &c., without "taking," gave additional confirmation of the thoroughness and immunity of the primary subcutaneous scarless vaccination.]

Variolous inoculation, "the only proper test," according to a Report of the British Provincial Association, though suggested, was not to be allowed in this case.

In the paper of 1867, it was shown that whether the scar resulting from vaccination as usually performed be large or small is an incidental circumstance merely, dependent upon the amount of cutis destroyed by ulcerative processes not essentially peculiar to vaccine disease; and now, by the experiment just described, we have a complete demonstration that a scar is not absolutely necessary to perfect vaccine disease or its protective power.

Two other persons were vaccinated subcutaneously, but were afterwards found unsuitable for full experiment, though the results are not without interest. To continue Dr. Davenport's account:—

"Dec. 8th.— y , aged 33, vaccinated subcutaneously as before described.

"Dec. 11th, 4th day.—Swelling of the size of a small filbert, deep and under the skin. No tenderness in axilla. Arm itches a little. No redness or other symptoms.

"Dec. 13th, 6th day.—Swelling subsiding.

"Dec. 15th, 8th day.—No appearances. Now states that when she said that she had not been vaccinated, she meant during the present epidemic!

"Dec. 30th.— z , aged 12 years, vaccinated subcutaneously.

"Jan. 8th.—No appearances. Now admits a mistake, and says that he was vaccinated several years ago."

In both these cases there was nothing to be seen subsequently, save the minutest point where the needle penetrated. It was ascertained, later, that both had been properly vaccinated, though the marks now pointed out are equivocal. These cases show, however, that subcutaneous re-vaccinations may not be unlike many other re-vaccinations performed in the usual way, in general nugatory features and results; and are recorded here chiefly to show this, and the comparative harmlessness of the subcutaneous operation. The last was not so clear previous to the trial, and the responsibility, in case of untoward event, had to be fully assumed at the outset.

It is certain, however, that in the first case the boy *x* had never been vaccinated previous to our experiment. To his case, therefore, no exceptions can be taken.

These are the only instances where subcutaneous vaccination has as yet been permitted; but now that it has proved to be unattended by disagreeable results, the experiment can be repeated, without risk, by others who may incline to try it for additional confirmation of the fact now established.

EPILEPSY FOLLOWING INJURY TO THE HEAD.

Read at a Meeting of the Suffolk District Medical Society. By I. H. HAZLETON, M.D., Boston.

On the evening of Friday, Sept. 8th, in New York city, —, a young man 22 years of age, weighing about one hundred and forty pounds, fell upon the floor, from a height of nine feet, striking upon the back and left side of his head. He was insensible over twenty minutes. Vomited on recovering consciousness; body cold; pulse, about an hour after, 32. There was no paralysis, nor trouble with any of the special senses. There was a large ecchymosis over the left mastoid process, without any signs of fracture of the bones of the head. In a fortnight, he had so far recovered as to return to his store, gradually resuming work, and feeling about as well as ever.

About the 10th of October, he began to have a cough without any expectoration, loss of appetite, night sweats, vertigo, and pain in the head, which he thought was occasioned by the severity of his cough. When in bed, was not troubled with vertigo, and cough was less severe. His stomach could not tolerate much food. There was a slow but steady progress in the severity of his symptoms.

I saw him Sunday morning, Oct. 22. He was in bed, a little emaciated, eyes lustrous, pulse 88 and soft; tongue moist and clean; bowels regular. He complained of cough and of being light-headed. Could only eat simple food. The cough was dry, frequent and paroxysmal. Could not detect any physical signs of lung trouble. He said that the night sweats varied in quantity. As he was unwilling to go to any of the hospitals, and could not receive proper attention at his boarding-place, he concluded to come to my house for treatment. We left New York Oct. 24th in one of the Fall River boats. He remained in his room till we took the cars. Was but very little fatigued by the journey, and appeared better the next day, but was advised to keep his room. The syrup of iron, quinia, and strychnia, one teaspoonful twice a day was prescribed.

On Saturday, Oct. 28th, he began to be dull and depressed. In the afternoon, his face was flushed; head hot; pulse 96, full and bounding; tongue clean, but less moist. There was perceptible throbbing of carotids. Said that his head did not ache. Discontinued the syrup, and gave simple fever drops. At 11.30, P.M., went into his room and found him unconscious, on his left side, with the left arm extended, hand clinched, head drawn to the left, eyes rolled up and drawn to the left. There were slight convulsive movements of the right side. In a few minutes the whole body was convulsed, the right side more than the left. The pupils were widely dilated. There was the same turning towards the left. No protrusion of the tongue. No involuntary discharge of urine or feces. Near the end of the attack, there was twitching of the face, which continued some time after the other convulsive movements had ceased. From the commencement of the attack till after all spasmodic action had disappeared was about fifteen minutes. The body was bathed in perspiration. He then went into a deep sleep. Twenty minutes after, he had another seizure of the same character, but much less severe, and of shorter duration. Gave a solution of bromide of sodium (gr. x.) twice during the night.

When he awoke in the morning, he said he had had another one of his night sweats, and thought it was worse than any of the others. At stool he was much amused by the twitching of his left leg. Solution of bromide of sodium (gr. v.) four times a day was ordered. The next day, noticed that he used left arm but very little, and was more or less helpless, and found that both the arm and leg of the left side were para-