

Hospital with a second attack; and I have heard of several other cases.

If, then, says Ballard, an attack of small-pox—which is a disease natural to man—does not always, even when severe, destroy forever the receptivity of the individual suffering it; it can surely be no matter of surprise, that, in occasional instances, vaccinia—a disease foreign to men—should fail to effect that which an attack of small-pox, itself, does not always accomplish.

But, it is asserted that if vaccination does not invariably confer immunity from an attack of small-pox, it renders it less severe, by exercising a most marked modifying influence over the progress and issue of the disorder.

But, again, there are some conditions on which the protective power of vaccination depends which are under our own control; then, what are these?

First, then, it is within our own power to secure *perfect* vaccination, in other words, to secure the fullest protective power of the vaccine disease, and this depends upon the perfection of its development as an exanthematous disease; upon the closeness of the similarity it exhibits to small-pox in its process of development, in truth, upon the perfection of the substitution.

The production of a *perfect vesicle* is alone insufficient without the constitutional disturbance, both are equally important, because both are pathologically associated. The *areola* indicates the incapability of the system to undergo further impression, and the development of the *vaccinal fever* and *areola* indicate that the system has become fortified against the receptivity of *small-pox virus*, even by inoculation, at any future time.

As to the local phenomena, the fulness of the eruption and the number and character of the vaccine vesicles are to be considered.

The degree in which protection from small-pox depends upon the character of the vesicle produced by vaccination is very considerable; as imperfectly developed or abortive vesicles are a sure indication of some defect either on the part of the *virus* used or the patient's constitution, and demands an application of Bryce's test of re-vaccination upon the other arm on the fifth day. A well-developed vesicle, with a well marked areola, which usually appears on the eighth, sometimes not until later (I have had it appear on the 10th, and, in one case, no appearance of the arm taking appeared until the 12th day, which caused the appearance of the *areola* to be deferred until the 15th day, but these cases are exceptional) and a profound vaccinal fever, are the best indications of a successful vaccination.

About the fifth or sixth day, usually, (sometimes later with Longue Pointe virus) a red pimple may be felt at the point of vaccination, which gradually increases in size and prominence until the eighth day, when it is fully developed, and usually presents the appearance of a *small-sized bead of pearl* set in the skin. After the areola has developed it answers very well to the description of a *bead of pearl upon a rose leaf*. The nearer the animal, the smaller, more circumscribed, harder, more elevated and firm the vesicles appear. Generally there are a number of them; corresponding to the number of points of infection, which usually coalesce and, running together, form a larger scab, of a brownish mahogany colour, thick and elevated, and, when held up to the light, translucent in appearance. I have never had any suppuration or ulceration as yet in any case from this virus: Good, well-filled vesicles, always leave good well marked circular scars; which may be seen plainly at a distance. They are very distinct, sunk beneath the level of the surrounding skin, having a rather well marked edge, and foveated or dotted with minute indentations, in a few cases striated, the fovea being most numerous near the outer circle of the depression.

In every case, where the vesicles are not well developed and full, I have taken the precaution to re-vaccinate upon the other arm, in which case the second seems to add intensity to the first, both mature, and the crusts fall off at about the same period, or from the sixteenth to the twentieth day.

There are three tests recommended as applicable in judging respecting the amount of protection any case of vaccination has afforded:—1st. The subsequent inoculation of small-pox virus, or Jenner's test already spoken of; 2nd. The result of casual exposure to contagion; and, 3rd. An attempt to reproduce the disease by re-vaccination, or Bryce's test. As to the value of the first there can be no question whatever; as to the second, the length of time after vaccination and the degree of exposure will determine the result. All other things being equal those persons having good scars on their arms are less frequently attacked with small-pox than people with bad scars. But all persons are not equally exposed, and this mode of reasoning is fallacious, for one good mark with strong fresh virus would be more protective than several marks with old deteriorated virus, as I will presently shew. Drs. Jenner and Woodville's original tests with small-pox, were all made upon persons upon whom the animal virus had been used in *one point* only,