Art. LXIII.—*Is it expedient to make Vaccination compulsory?*

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[*Read before the Auckland Institute, 20th July, 1891.*]

Finding my name and opinions much quoted in the publications of the Anti-Vaccination League, and in the evidence given before the Royal Commission on Vaccination now sitting in London, I am desirous of recording my opinions on the question of compulsory vaccination in a more formal manner than I have hitherto done. The subject is one of great and increasing importance and interest—few are more so, as it is a question which is personal for every parent of children born on British soil or in British colonies.

Let us begin by defining our terms. I ask, Is it *expedient* to make vaccination compulsory?—not "Is it right?" I use the term "expedient" advisedly, since we have no national or authoritative code or basis of ethics, and the terms "right" and "wrong" are therefore inapplicable. Under a parliamentary system the individual has no rights; his life, his health, his property, are all at the mercy of the supreme power residing in Parliament. Nevertheless, like all despotisms, Parliaments find it expedient to exercise their supreme power within certain self-imposed limits. It would be quite within the competence of Parliament, and would be the logical sequence of the Compulsory Vaccination Act, to enact that, when the parents object to vaccination, their children should be taken from them by force, and vaccinated by force. But the inexpediency of sending a policeman to snatch a baby from its mother's arms in order to have it vaccinated, was stated as the reason for not resorting to legislation of this extreme kind.

Then, what is "vaccination"? It is too well known to need a description of its external symptoms or appearance; but it may be as well to note that there are two kinds of vaccination—the one derived from a disease which appears to be a natural disease of the cow and horse—the true Jennerian vaccinia—and the other derived from the inoculation of human small-pox into the heifer or cow. Owing to the feebleness and apparent inefficiency of the Jennerian vaccine, Mr. Marson, some twenty-five or thirty years ago, inoculated

cows with human small-pox, and obtained vesicles of modified small-pox, from which he vaccinated children. This form of vaccine proved much more powerful than the Jennerian vaccine, and was very extensively used. I procured a supply from Mr. Marson when I was Vaccinator-General of Trinidad, and introduced it into the island; many thousands of children were vaccinated from it.

It is important to remember, in the discussion of this question, that vaccine, generally speaking, is only modified small-pox. The reason, and the only reason, for vaccinating infants is to prevent their having natural small-pox; in other words, the law compels them to suffer a mild form of small-pox, inoculated, in order to prevent them from having small-pox in the natural way by ordinary infection. This procedure is vindicated on the ground of public safety, and an appeal is made to the experience of former days, before vaccination was introduced, to show the terrible ravages committed by small-pox, and the comparative immunity created by vaccination.

In my younger days it was contended boldly that a thoroughly successful vaccination, leaving four good and characteristic scars, was an all but absolute preventive of an attack of small-pox for the whole of life. Nobody maintains this view now. It was Marson's view, supported by statistics which he had gathered from his experience at the Small-pox Hospital, London, and from other sources. With two good marks, the mortality was only 3·6 per cent.; with three marks, 3·1 per cent.; and with four marks, 1·6 per cent. But it is to be noted that in 1876–78 the mortality among persons having four marks was 3·1 per cent. at the Hampstead Hospital, one of the finest hospitals in the world, in a magnificent situation, and with every possible aid that medical skill could afford. Now, 3 per cent. of deaths in an acute disease, tending to terminate in health, and among patients having all the advantages just enumerated, would serve to show that there is very little protective influence in the vaccine itself. In an epidemic of typhoid in a tropical climate, amongst patients mostly of the lowest class in the community, living in the most insanitary dwellings, badly fed and badly nursed, I have had a mortality of only three out of ninety-three cases, or 3·2 per cent. I have had a mortality of only 4 per cent. in an epidemic of acute scorbutic dysentery in the same colony among 111 patients. So that a mortality of 3·1 per cent. does not imply any specially protective power over those attacked.

But does vaccination protect the vaccinated person from an attack of small-pox? In other words, if a thousand vaccinated persons and a thousand unvaccinated, living under

similar circumstances, belonging to the same race, are exposed to the same danger of infection, will more of the unvaccinated than of the vaccinated be attacked by small-pox? To my mind, there can be but one answer to this question. Undoubtedly a far larger proportion of the unvaccinated will be attacked. I will go even further, and say that, in proportion to the length of time that has elapsed since the vaccination, and the thoroughness of the operation, a much larger proportion of the vaccinated will have small-pox in the mild or discrete form, and so the mortality amongst the whole number attacked of vaccinated persons will be smaller than that of the number attacked who were unvaccinated. It must be remembered that a discrete attack of small-pox is never fatal unless by some gross mismanagement. But if the vaccinated persons get the confluent or hæmorrhagic forms, then, other things being equal, I believe their mortality will be as large as if they had never been vaccinated.

The question still remains whether, vaccination being partially protective against attacks of small-pox, it inflicts any such permanent injury on the constitution as to make it better to risk a possible attack of small-pox than to endure the evils produced by vaccination.

To answer this question we must consider (1) what are the inevitable evil results of vaccination, and (2) what accidents may occur, either unavoidable in themselves, or only to be prevented by the use of precautions which it is hopeless to expect the use of, when vaccination is performed on a large scale.

Now, the direct and unavoidable evils of vaccination are the infliction of an acute febrile disease, accompanied by a painful eruption, and an alteration of the state of the whole blood from its normal condition to one which for some years, and those the most important in the growth and the development of the body, renders it incapable of nourishing or reproducing the small-pox germ. The febrile disease is a temporary affair, and not, in the vast majority of cases, dangerous to life. When children are so delicate or unhealthy as to make the vaccine fever and eruption dangerous they can always be excused the operation.

The permanent change in the blood is quite another matter. I commenced, but have never completed, some microscopical investigations into the conditions of the infant's blood before, during, and after vaccination. It is evident that a fertile field for inquiry is open here; and without a series of well-conducted examinations, extending over children of different races, and in different climates, no positive conclusions could be arrived at. But of one thing we are quite certain, as it does not need the aid of a microscope: there is a

large destruction of the red corpuscles during the febrile stage of vaccinia, followed by an anæmic condition. How long this anæmic condition lasts we have no trustworthy observations to tell us; and how far it extends—that is, what is the actual loss of red corpuscles—is, as far as I know, in the same state of uncertainty. Of course, we often find parents complaining that children who were perfectly healthy before vaccination have lost colour, strength, and flesh after it, and have never recovered their previous good health. But these complaints, tinctured as they evidently are by a strong prejudice against compulsory vaccination, must be received with caution. Still, there is such a mass of evidence of this kind that it ought to be allowed some weight.

So much for the inevitable results of vaccination. The accidents of vaccination may be roughly classified under the following heads:—

1. Inflammatory: including erysipelas and other septicæmic diseases; glandular swellings; phagedæna, sloughing, or mortification at the points vaccinated.

2. Eruptive diseases, mostly of a pustular character, occurring with or immediately after the vaccine eruption; eczema, herpetic eruptions, ecthyma, and impetigo.

3. The inoculation of constitutional diseases—syphilis, leprosy, tubercle.

Now, as regards the inflammatory diseases, there are some vaccinators of large experience who assert that they have never seen any ill-results of this kind arising from vaccination. Well, some people are very lucky, but they have no right to argue from their limited experience that such accidents never occur. I have been very fortunate in my midwifery cases; I have never lost a case in my own practice for thirty-five years; but for all that I do not deny that women die in childbirth. I have seen erysipelas more than once or twice, or a dozen times. In the West Indies it used to be common. The inflammation that followed the vaccination of coloured children was very intense, and the number of insects attacking the unfortunate children no doubt contributed to carry the germs of erysipelas to them. Glandular swellings, particularly in scrofulous children, are not rare. I had myself a case in which each vaccine vesicle was followed by mortification of the skin beneath it, and a phagedænic ulceration which required very vigorous measures to stop it. This was in a young woman during the epidemic period in Trinidad. I am not sure whether it was a primary vaccination or a revaccination. The latter, as is well known, causes very severe inflammation, pain, glandular irritation, and erysipelas in the majority of adults, besides severe and most

oppressive febrile disturbance: at least, this is the case at the time of epidemics, when revaccination is most practised.

Post-vaccinal eruptions are so very common amongst the children of the poorer classes in England that they form one of the stock arguments against vaccination.

The inoculation of constitutional diseases used to be laughed to scorn in my younger days. It was said in my hearing by Sir John Simon, K.C.B., then Mr. Simon, the Medical Officer of the Privy Council, that no such inoculation could take place without gross carelessness or unskilfulness on the part of the vaccinator. I used to be of the same opinion; but a case I saw some sixteen or seventeen years ago convinced me that an infant might look perfectly healthy, and yet be the subject of unmistakable hereditary syphilis. The evidence that syphilis has been communicated by vaccination is simply overwhelming. I may refer to the report of the Committee of the House of Commons on Compulsory Vaccination; the Third Report of the Royal Commission on Vaccination now sitting in London; the work of Mr. Jonathan Hutchinson, F.R.S., late President of the Royal College of Surgeons of England, on syphilis, in which he devotes a chapter to the description of vaccinal syphilis; and my own experience in this colony and elsewhere. I have seen three cases in this colony alone.

The inoculation of leprosy by means of vaccination is now exciting much attention. It will form one of the subjects which the Commission of Inquiry sent out to India by the National Leprosy Committee will have to investigate. My friend Mr. William Tebb, whose arduous and disinterested labours for many years as Chairman of the Executive Council of the Anti-Compulsory Vaccination League must excite the admiration even of his opponents, has literally circumnavigated the globe in his search after evidence on this point. The alarming spread of leprosy of late years contemporaneously with the extensive diffusion of vaccination must cause thoughtful men to consider the question very seriously. When I was examined before the Committee of the House of Commons I gave evidence to this effect.*

On my return to Trinidad I had to encounter an epidemic of small-pox which spurred us on to vaccinate right and left, and to revaccinate all who would submit to the operation. But so firmly fixed was the belief of the people that vaccination from a child of a leprous family would be a possible cause of the vaccinated person becoming leprous, that not even the fear of such a terrible epidemic of small-pox as was then going on would induce them to allow themselves or their

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* *Vide* Report of the Committee of the House of Commons on Compulsory Vaccination, Answers 3563, 3564, pp. 207, 208.

children to be vaccinated from any vaccinifer in whose family any member was a leper. And then, to my astonishment and dismay, I found that there was hardly a Creole family in the island—white, coloured, or black—free from the taint of leprosy.

The evidence accumulated by Mr. Tebb and contained in the Third Report of the Vaccination Commission is most interesting and valuable. He quotes from many medical men of experience in support of his views. Dr. Arning, formerly of Honolulu, says: "The unusually rapid spread of the disease about thirty years ago may possibly be attributed to the great amount of indiscriminate vaccination carried on about that period. . . . I attach far more importance to an instance of an increase of leprosy soon after vaccination on a much smaller scale and during a much more recent period than the above." Then he alludes to a "very remarkable new crop of leprosy" which had "sprung up at one of the islands in the year 1871–72, about a year after most careless vaccination had been practised."

That bacilli exist in both leprosy and tubercle is beyond all dispute; that the bacilli of these diseases may be grown and cultivated in suitable media is ascertained as a fact respecting one of them — tubercle — and, although not experimentally proved as regards the bacillus of leprosy,* yet is almost beyond doubt. Artificial nutrient materials have hitherto failed, and it is not allowable to try the only natural medium—the blood and tissues of a person living under conditions likely to develope leprosy. I have no doubt, from seeing the origin of leprosy cases, and studying several hundred cases of the disease, that it is not only inoculable, but that it spreads by inoculation or absolute contiguity, and I have no hesitation, after twenty years' consideration of the subject, in affirming again the opinion given before the Committee of the House of Commons.

Inoculation of Tubercle.—Considering the great abundance of tuberculous diseases, and the infinitely various ways by which the tubercle bacillus may be introduced into the system, it may seem hardly worth while to guard against the small chance of inoculating with lymph from a tuberculous child. Yet the same objection would lie about the inoculation from a syphilitic child. Inoculation in either case would almost certainly give the disease.

Having now as briefly as possible considered the essential and accidental dangers of vaccination, we have to answer the practical question, "Is it expedient to make vaccination com-

* Since this paper was read, it is reported that the *Bacillus leprœ* has been cultivated in India.

pulsory?" To this question I give an unhesitating answer in the negative. I hold that it is not expedient to force vaccination on the people,—

1. Because vaccination does not invariably protect from small-pox even for a few months. [See my book on small-pox, pp. 40, 41.]

2. Because the protective influence of vaccination is so feeble after the age of puberty that revaccination becomes necessary whenever the person is exposed to immediate danger of infection.

3. Because even revaccination repeatedly, successfully, and recently performed does not protect from an attack of small-pox—*e.g.*, my own case after *five* successful vaccinations, the last within six months of the attack of small-pox.

4. Because vaccination, even performed with care, may be followed by accidents which may destroy life, or produce permanent constitutional changes of an injurious character, or be the means of introducing the germs of syphilis, tubercle, or leprosy into the system.

5. Because in this colony vaccination is quite unnecessary, inasmuch as small-pox has never spread here, although it has frequently been introduced. Hence it appears that our system of quarantine, although far from perfect, amply suffices to preserve us from small-pox.

6. Because, so far from compulsory vaccination being expedient, vaccination here is highly inexpedient, and may be followed by much evil, while it cannot do any good.

I must guard myself on one point. I am not prepared to recommend that vaccination—that is, as I understand it, the inoculation of a modified small-pox in infancy—should not be practised in Europe, where the conditions of life are totally different. Nobody who has seen small-pox of the severer types—confluent, corymbose, or hæmorrhagic—would be inclined to deny that vaccination, with its possible dangers, is far preferable to an attack of natural small-pox. The horror and disgust inspired by a small-pox patient, the hideous loathsome aspect of the face, the horrid smell, the frightful pits and scars that often result, the blindness and deafness that sometimes follow; and the difficulty of getting nursing attendance for such cases, can only be appreciated by those who, like myself, have attended small-pox patients and hospitals in an epidemic. I saw cases in England—a few dozen, perhaps—but until I had to attend in an epidemic, where we had over twenty thousand cases in a year in a small island, I had no adequate idea of what small-pox was. Young people of the present day have no idea of what ravages small-pox used to inflict. Forty or fifty years ago a very considerable percentage of the population in Britain was pitted by small-pox, and the disfigurement this

occasioned amongst women was one cause of the great and rapid spread of vaccination. There is not a woman in existence who would not risk any possible damage to her health or constitution if it would save her from the disfigurement produced by confluent small-pox. There is another point too: the dread of the disease often causes people to take it, and makes it fatal when taken. The protective influence of vaccination, therefore, has a double action, physical and mental.

For these reasons I cannot, in the present state of sanitary science, or rather ignorance, see how vaccination, voluntary of course, can be given up in Europe, or in thickly-peopled countries like North America.

ART. LXIV. *Brake-Fins: A Proposed Appliance for the Better Handling of Ocean Steamers.*

By the Rev. PHILIP WALSH, Waimate North.

[*Read before the Auckland Institute, 24th August, 1891.*]

WHEN we contrast the modern ocean liner with the old sailing-packet that many of us are able to remember, we cannot but be amazed at the giant strides that have been made within a very few years in the numerous arts and sciences upon the correct application of which a safe and prosperous voyage depends. The confined space on deck, the stuffy cabins, the rough-and-tumble of slippery planks and flying tackle, the salt diet, and the hazardous cookery—all these have given way to a new order of things, and a sea-voyage is now looked forward to as a prolonged picnic in a floating palace furnished with all the conveniences of a first-class hotel, instead of a tedious imprisonment, during which every element contributed its share of discomfort. But the improvement, astounding as it is, has not been uniform; the advance has not taken place along the whole line: indeed, in some departments there has been a positive standstill, if not actual retrogression.

The most noticeable instance of this deficiency is that which regards the handling of vessels under certain important and inevitable conditions. Given plenty of sea-room, when the only question is how to get over the ground—or, rather, the water—in the shortest possible time, there is no comparison between the modern ship and all those that have preceded her, whether impelled by sail or steam; but when it is