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**REPORT**  
**ENDORISING VACCINATION**  
**AS A PREVENTION AGAINST**  
**SMALLPOX**

BY  
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REPORT OF DR. CHARLES J. HASTINGS, MEDICAL OFFICER OF  
HEALTH, ENDORSING VACCINATION AS A PRE-  
VENTION AGAINST SMALLPOX.

SUBMITTED TO THE LOCAL BOARD OF HEALTH, NOVEMBER 13TH, 1919.

The epidemic of smallpox that we are now confronted with in Toronto has gained its present proportions in consequence of the mild character of the outbreak and the differences of opinion for some weeks past as to the diagnosis, a great majority of the cases having been diagnosed as chickenpox. I may say, however, that similar epidemics and outbreaks have occurred in a very large number of the States in the Union during the past fifteen years, in many cases there being probably only one or two of the pox that appeared on the individual patient that had any characteristics of smallpox, the great majority not going beyond the stage of the vesicle, and consequently resembling chickenpox rather than smallpox. However, a definite opinion has been arrived at, and there is no question about the cases under quarantine. No doubt there are also an enormous number of cases that have not been reported, being a mild form of this disease.

In this connection, it is important to bear in mind that this mild form of the disease is quite as communicable as is the more severe form, and that more serious cases may develop at any time. The total number of cases reported up to Tuesday morning of this week is 227. The spread of the disease seems to be rather on the increase, as the average number previous to this date was 25 during the 24 hours, but in the 24 hours preceding Tuesday, 58 cases had been reported. A portion of these are being cared for in the Smallpox Hospital and the balance are quarantined in their homes.

OVERWHELMING ENDORSATION OF VACCINATION.

The present outbreak of smallpox has revealed to us a lamentable lack of knowledge in a certain group of our population at least, as regards vaccination, which, in the light of our present knowledge of this subject, is incomprehensible. Previous to this, one felt justified in concluding that if these people would have even read intelligently the newspaper reports during the war that we have just passed through, they could not have failed to recognize the value of vaccination against smallpox, typhoid fever, paratyphoid and tetanus.

When the various nations entered the war, they called into requisition the best scientific skill in all activities, including the highest recognized authorities in medicine, surgery, bacteriology and scientific medical research, in order that our boys might be efficiently protected and receive the advantage of the united opinions of the aforesaid authorities. The consensus of opinion of these medical experts, not only of the Allied Nations, but also of Germany and Austria, was to the effect that no man should be permitted to enter the firing line until he was successfully vaccinated

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against smallpox, typhoid fever, para-typhoid and tetanus. The result of this was that there was not a death from smallpox on the entire Western Front during the whole period of the war, and the deaths from typhoid, para-typhoid and tetanus were practically negligible.

When one considers that this group represented the largest gathering of intellectual lights in advanced medical, surgical and bacteriological science ever assembled, one would think that such an overwhelming endorsement of the value of vaccination against smallpox would appeal to men of even the most ordinary intelligence as being most convincing.

To this we can add the endorsement of every scientific medical research institution in the civilized world, embracing; such institutions in England and on this Continent as the Lister Institute for Research, the Rockefeller Foundation for Medical and Scientific Research, the Carnegie Foundation for Scientific and Medical Research. To these might be added the endorsement of those who have immortalized their names in the field of medical and bacteriological research and have passed on to the next cycle of existence. I refer to such men as Jenner, Pasteur, Lister, Koch, Van Bering, and scores of others. And again to these may be added the British Medical Association, the American Medical Association, the Canadian Medical Association, the Local Government Board of Great Britain, the Department of Health of Great Britain, the various British Public Health Associations, the American Public Health Association, the American Association of State and Provincial Health Officers, the Canadian Public Health Association and the various Provincial Health Officers' Associations of the Dominion. The Ontario Medical Association, the Toronto Academy of Medicine, the New York Academy of Medicine, and in fact every recognized Medical Association throughout the civilized world. So that one can readily understand why, in the 60-page article on Smallpox and Vaccination, in the System of Modern Medicine, by Sir Wm. Osler, Regius Professor of Medicine in Oxford University, and Professor Thos. McCrae, M.B., F.R.C.P., Professor of Medicine in the Jefferson Medical College, the author goes on to say:

"Smallpox is highly infectious and no immunity is given by race, age, sex, season or even the most sanitary environment. Notwithstanding this, so great is the protection given by vaccination and re-vaccination, that a large majority of physicians who have been in practice for years have never seen a typical case of smallpox, and in civilized lands we rarely see an individual carrying the scars produced by this disease. The disease is infrequently seen, but its presence is continued by the ignorant or by the careless. The floating population, who do not acquire residence so as to be subject to vaccination laws, are often responsible for epidemics. The disease is also kept in existence by a class of people that have that peculiar order of mind which renders them incapable of sane judgment and who seek in every way to oppose vaccination and re-vaccination, not only for themselves, but for others. One of the saddest features in this connection is that in every epidemic there are a number of unvaccinated, innocent children, in no way

responsible, who die of the disease or are permanently disfigured or blinded."

#### EVIDENCE OF THE INFLUENCE OF VACCINATION ON SMALLPOX.

The statistics of the London Smallpox Hospital show that the mortality of the unvaccinated was 35.5 per cent., and of those protected by vaccination 8.7 per cent. It is a recognized fact that even where smallpox occurs amongst those that are vaccinated it assumes a modified and usually an abortive form.

Possibly the most striking test of the possibilities of vaccination was in the war of 1870-71. This was the result of the far-sighted care of the German Military Authorities. The following are the comparative figures of case mortality in different classes:

First—Those that had been only once vaccinated	14 per cent.
Second—Those re-vaccinated	5 per cent.
Third—Those not vaccinated at all	45 per cent.

With all her shortcomings, Germany has been among the nations that have led the world in safeguarding their people against smallpox. In 1874, the first law was passed requiring vaccination of every child in the German Empire before the end of the second year, and re-vaccination of all school children in the civil population before they reached their twelfth year. The mortality from this disease sank rapidly so that in 1910 the deaths from smallpox in the whole Empire of over sixty-five million people were 33, fifteen of these being foreigners. Previous to the compulsory vaccination Germany had from two thousand to three thousand deaths annually.

Another striking evidence of the protective value of vaccination is in the Philippines, Cuba, and Porto Rico. In the Philippines, under Spanish rule, there were about 40,000 smallpox deaths yearly, and 6,000 in Manila. Although the people were at first bitterly opposed to vaccination, yet under the American Government compulsory vaccination was carried out in a most successful manner. So rapid were the results that since 1906 there has not been a single death from smallpox in Manila, and the mortality in all the Island has dropped from 40,000 to 700 per year. Over six million of the Philippines have been vaccinated, without a single death, and where originally they fought the measure viciously, they have now learned to appreciate its results and seek vaccination with avidity.

It is rather interesting to note in this connection that owing to the precautions taken by the Hebrews to have their children vaccinated in early life, we have never had a case of smallpox in Toronto amongst the Jews previous to the present outbreak. Dr. Evans, former Commissioner of Health in Chicago, says that they rarely have a case of smallpox among the foreigners as they practically all come from countries where vaccination is compulsory. "Vaccinated foreigners," said Dr. Evans, "living in slum conditions, in all our cities, are much freer from smallpox than are our native born in the best residential districts."

In Africa, nearly everyone is pock-marked. The mortality from smallpox ranges from 25 to 50 per cent. In fact, in every nation where vaccination is not in force and the people are not vaccinated, the mortality from this disease ranges from 10 to 40 per cent. In 1914 the deaths from smallpox in Germany were 7, while in the neighboring countries where vaccination was not compulsory the number of deaths annually ranged from 800 to 5,821.

Previous to the time of Jenner, 95 per cent. of the people exposed to smallpox contracted the disease and an average of 25 per cent of these proved fatal. It has been estimated that an average of 90 per cent. of those not vaccinated, if brought into direct contact with the disease, will contract it, and at the same time it has been demonstrated that at least 90 per cent. of those vaccinated if brought in direct contact with the disease, will escape infection. The number of cases of smallpox in any community is a true index of the extent to which compulsory vaccination is being enforced and is also accepted as an accurate index to the intelligence of the people.

It is obvious then that the only objection that so-called conscientious objectors to vaccination can raise is the alleged dangers of complications from impure vaccine itself following the operation of vaccination, and it is regrettable that we have had such gross exaggeration and misrepresentation in this connection. In the first place, practically all the vaccine used for the vaccination of our children is glycerinated vaccine and prepared at the Connaught Laboratories, under the supervision of the best recognized experts in the country. This vaccine is guaranteed to be absolutely free from any pathogenic germs.

One can understand that in the early history of vaccination, when direct inoculation took place, and when the arm to arm process of vaccination was in vogue, that that procedure left itself open to objections, and the possibilities of undesirable complications. That procedure is now condemned by our Legislature and is no longer permitted, and therefore need not enter into the discussion of this subject.

#### ALLEGED DANGERS FROM VACCINATION.

The gross misrepresentations of facts in this connection by those opposed to vaccination and for the purpose of discrediting vaccination might be looked upon, in the light of modern knowledge, on this subject, as a huge joke, if it were not for the tragedy of it. Fortunately these people are not taken seriously by the intelligent, but there is a large number of people in every municipality who have not the time nor the opportunity to obtain the facts, and that is my apology for bringing this problem before your Board. These people must be protected against these misrepresentations as well as against the smallpox.

It must be distinctly understood that the operation for vaccination is a minor surgical operation. That is, the epidermis, or outer layer of skin, is

removed over one or two small areas in order that the surface exposed may be capable of absorbing the virus, and that there is the same element of danger in connection with this tiny wound that there would be in connection with any other wound if it were not properly cared for until it had entirely healed up. With the perfected vaccine that we have at present and our knowledge of the necessary precautionary methods to be observed in vaccinating, I do not think any Health Officer would hesitate to guarantee that there would be no complications following the operation of vaccination, no matter how large a number there might be, providing these cases would be under more or less constant observation, or would report at stated intervals for treatment such as in any minor operation. But inasmuch as there must be a large number in every municipality who will not take these precautions, there is always a possibility of an occasional sore arm developing. However, in the 7,000 cases which I vaccinated at the old City Hall in the epidemic of 1885, there was not one single fatal case.

Let us look on some of the facts in regard to recent experience. In speaking to the A. D. M. S. for this District on this matter, he advises me that among the first 50,000 of our boys sent out from Valcartier, who were vaccinated, there was not one fatal case, nor were there any serious complications, and that as far as he has been able to learn there was not a fatality in the way of a complication in over 500,000 of our boys that were vaccinated and sent overseas or retained for home service.

In the mobilization of the United States Army and Navy they have a record of 585,000 vaccinations, without a single fatality.

Then again Professor Rosenau of Harvard University quotes the experience of European nations in this connection, to show how seldom complications occur if proper care is used in the technic of vaccination. In 13 years from 1885 to 1898, 32,166,619 children were vaccinated. Of these 115 died within a few weeks or months after the operation, and further investigations show that one half did not die as a result of vaccination, and that the others were for the most part the result of wound infection, the same as might occur from carelessness in connection with even a pin scratch or a slight cut from a knife or a razor.

We have heard a good deal of talk about tetanus following vaccination. For years, since vaccines have been prepared under rigid precautions and government control, together with the more universal application of the principles of antiseptics and asepsis in the operation of vaccination, the number of such cases is practically negligible.

The American Public Health Reports from Washington show that from 1904 to 1913, inclusive, over 31,000,000 doses of vaccine virus were used in the United States, and while there were 41 cases of tetanus, yet when the histories of all the cases were obtained, there was no evidence to show that it had any connection with the vaccine.

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Dr. Anderson, formerly of the Public Health Service in Washington, in this report, states that infection with tetanus is received by the contamination of the vaccinated wound, such as might occur in the infection of any other minor surgical wound not properly cared for. One only needs to recall the enormous number of deaths from tetanus following the celebration of the Fourth of July until that was abolished.

Furthermore, out of over 6,000,000 vaccinated in the Philippines by the United States Public Health authorities, there was not one fatality, and yet the mortality from smallpox previous to the introduction of vaccination ranged from 25 to 40 per cent. and in some municipalities practically one half of the entire municipality was wiped out and the balance disfigured for life.

In the year 1917, reports from the New York State Department of Health state that in 50,000 vaccinations, in only one case out of the entire number did a death occur, which had the slightest connection with vaccination, and even in this case the evidence was not at all conclusive.

It must be apparent to you that it is impossible for me, having regard for space and time, to do more than quote some of the outstanding authorities who endorse in an unqualified way the value of vaccination as a protection against smallpox. We cannot all be experts in advanced medical science, but we should be sufficiently intelligent to interpret in an intelligent way the evidence placed before us by these scientists who are making a life study of these problems, and if we are not capable of doing this, we should know enough to maintain a dignified silence. If all the people in the world could be persuaded to stick to their last, the world would be much better advised and there would be decidedly less unrest.