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❖ VACCINATION ❖

BY

DR. JOSEPH F. EDWARDS.

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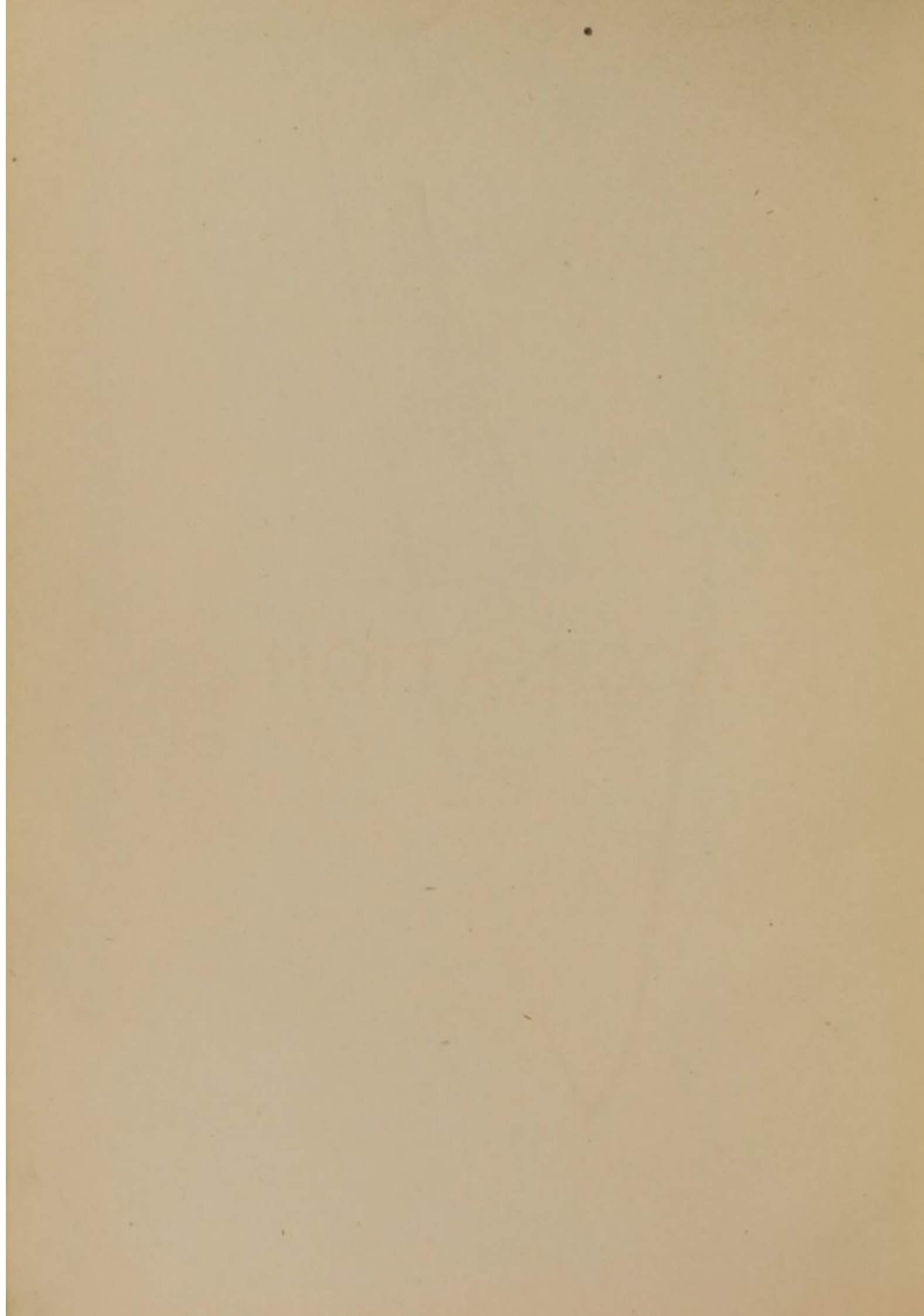
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ARGUMENTS PRO AND CON.

WITH A CHAPTER

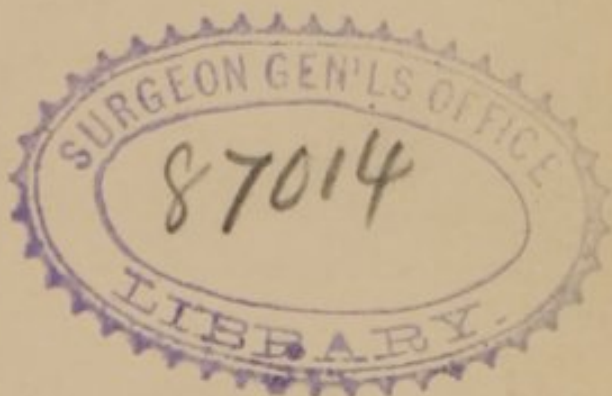
ON

THE HYGIENE OF SMALLPOX.

BY

✓
JOSEPH F. EDWARDS, M.D.,

AUTHOR OF "HOW A PERSON THREATENED OR AFFLICTED WITH BRIGHT'S DISEASE OUGHT TO LIVE," "CONSTIPATION PLAINLY TREATED AND RELIEVED WITHOUT THE USE OF DRUGS," "DYSPEPSIA, AND HOW TO AVOID IT," "MALARIA: WHAT IT MEANS AND HOW AVOIDED."
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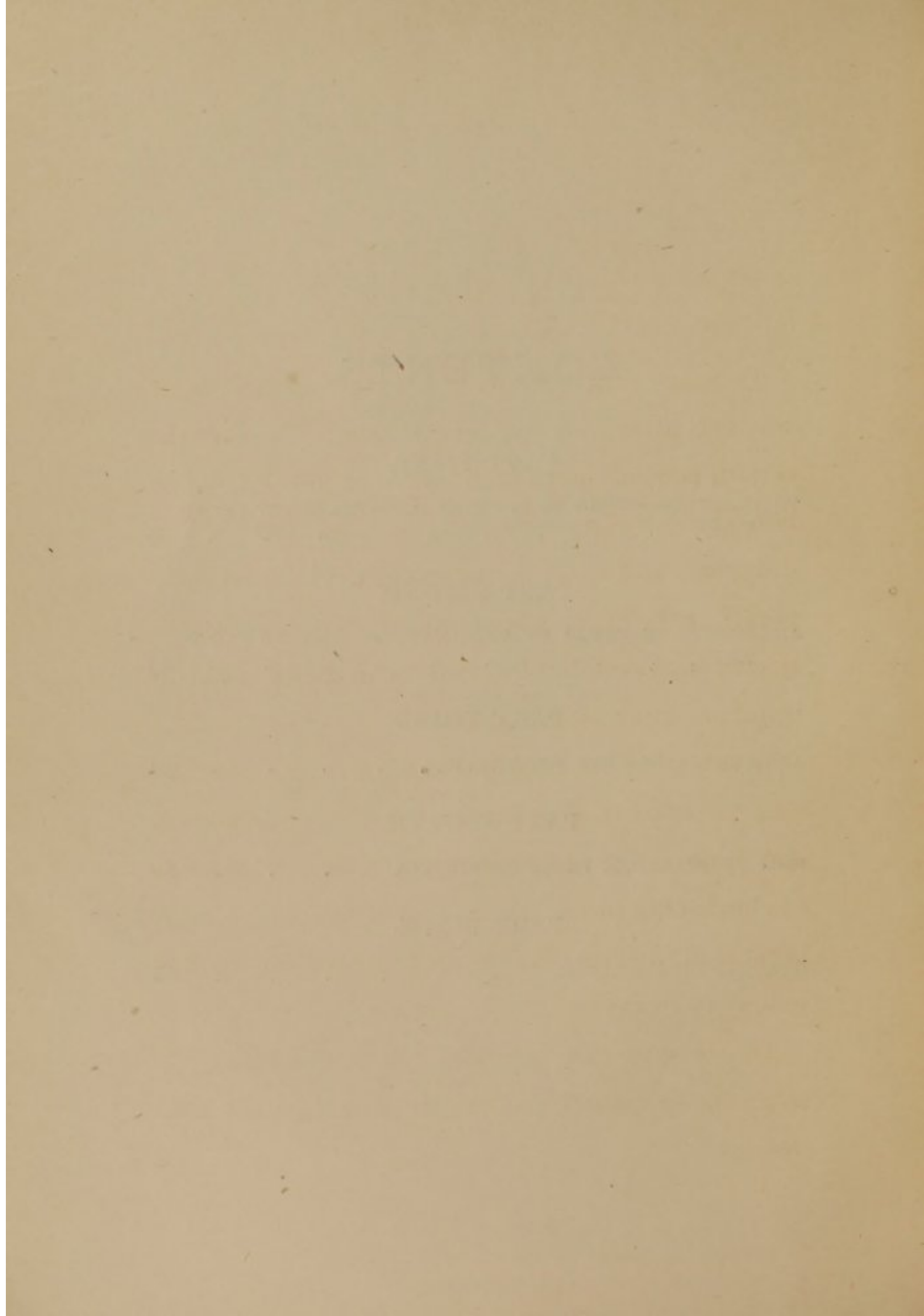
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PREFACE.

In a few simple words will be given the reasons why this little book has been written. The fact that certain persons, more particularly in the Old World, have recently attempted to cast vaccination into disrepute, and have, by numerous devices, sought to prevent persons from resorting to it as a preventive against smallpox, has induced the author to make an impartial study of the question.

Information has been gathered from all available sources, and the question has been viewed carefully and from an impartial standpoint, with the result of convincing the author that in vaccination properly performed, and in this measure alone, can we find immunity from this terrible disease.

The reasons that have led him to this belief will be given, so that the reader may form his own conclusions.

It has seemed wise to “*take the bull by the horns, as it were,*” and to anticipate the opposition which is as yet only in its incipency in this country, but which, if not checked in the bud, may blossom into dangerous fruit.

After discussing the question of vaccination, a short chapter will be found on the hygiene of small-pox.

It is sincerely hoped and confidently trusted that the questions herein discussed and the facts stated may result in convincing all who read of the efficacy of vaccination.

VACCINATION.

PART FIRST.

VACCINATION—WHAT IT IS—HOW DISCOVERED—WHAT IT DOES.

Most persons have only a hereditary and very illy-defined notion of vaccination. They regard it as a something, as a mysterious operation, which if successful, *if it takes*, confers upon them immunity from smallpox; but what it really means, how it originated, why it protects or how it acts, they know not; no one has ever told them. Their parents before them have been vaccinated, and so when an epidemic of smallpox comes around, off they run to the doctor and are vaccinated, because they have the idea, gained in some vague way from parents or friends, that this little operation has some mysterious power to protect them from the disease. But they know not how to reason for themselves concerning it, and how to determine whether or not they are receiving a benefit from it.

Therefore they are ready to receive the conclusions

of anti-vaccinators, if perchance they happen to know of a single instance of unfortunate results from vaccination among their friends, without being able to intelligently reason for or against the operation.

If they know all about it they are better prepared to use their intelligence so as to determine for themselves whether or not the operation should be performed upon them. In this belief, I deem it wise to place the whole question before the thinking public.

I will now, for a brief space, in plain words, tell you what vaccination means.

Vaccination consists in an operation by which the system of man is so impressed by the introduction of a foreign substance, and the blood so altered by changes which this matter produces therein, that even though the successfully vaccinated person may thereafter be exposed to the influence of the smallpox poison, yet it will not find in his system the conditions necessary for the development of the disease. This is, in a small compass, a comprehensive definition of vaccination, and it is my purpose in this little book to be brief; I do not intend to waste any words, but to give you, in as short a space and as concisely as possible, the principal points of the subject

under consideration. By doing so, I feel that you will read it, while, were I to be tiresomely verbose, you would cast it aside, and my purpose in preparing it would be defeated.

The interesting points touching the discovery of vaccination next claim our attention. Some of the most wonderful and important discoveries of the world have been, as it were, the result of accident, of chance; that is to say, chance has brought to the notice of some master mind capable of utilizing and developing them, the phenomena or material from which great discoveries have been made. Vaccination is a remarkable illustration of this proposition.

Towards the close of the last century, a young man named Jenner was studying medicine in the house of Mr. Ludlow, a surgeon of Sodbury, near Bristol. It was customary for the young student to be present when his master was treating patients, in order that he might become practically familiar with the means of detecting and curing disease. One day, a young country woman came to the office of Mr. Ludlow for treatment, and while there, the question of small-pox coming up, she innocently and thoughtlessly made the remark, "*I cannot take that disease, because*

I have had cowpox.” She little thought that by this simple remark she was laying the foundation for a discovery that would electrify the world. The active, penetrating mind of Jenner was struck by the remark. He treasured it in his memory, and never missed an opportunity of verifying the truth of this carelessly uttered statement.

He found it to be a common belief among dairymaids, that those who had once had *cowpox* enjoyed an immunity from smallpox. Observation convinced him that this belief was more than a superstitious notion ; he soon saw that there was much truth in it, and he commenced to reason something after this fashion.

If *cowpox naturally* produced does give immunity from smallpox, why will not the same disease *artificially* developed confer the same protection. He was laughed at and ridiculed, as all great discoverers ever have been. He was, however, firm in his belief of the truth of his idea, and, nothing daunted, pushed forward in his good work, that was destined to make his name immortal.

For more than twenty-five years Jenner and his theory were sneered at. The public paid no attention

to it or him, while physicians pooh-poohed the idea as preposterous. Finally, Jenner's triumphal day came. The day that should be forever celebrated, throughout the civilized world, as the one on which was made public and demonstrated as potent the greatest discovery in preventive medicine that has ever occurred in the history of the world.

On the fourteenth day of May, 1796, Jenner vaccinated James Phipps, and with all the nervous anxiety of Fulton waiting to see his little boat move when the steam was turned on, he waited and watched.

To his unspeakable joy, he saw all the different stages of *vaccinia* or *cowpox* occur regularly and perfectly, when, with an exultant shout, he cried out to his hitherto sneering confreres, "Behold the consummation of my dream."

Still he had many trials yet to endure before his newly discovered and demonstrated fact became a generally accepted one. Just as we declared our independence from Great Britain in 1776, and then passed through eight years of doubt and uncertainty before this declaration became an accomplishment, so poor Jenner was doomed to undergo many tribu-

lations before his ridiculed announcement of 1796 became an enthusiastically accepted fact in 1799. In 1798 he wrote and published a work containing the evidence he had accumulated concerning vaccination, which, though very convincing, still left many in doubt, so conservative were the physicians of Great Britain and so indisposed to believe in his wonderful discovery. The truth must always prevail, however, and finally, in 1799, about seventy of the most distinguished physicians and surgeons in London signed a declaration of their entire confidence in the benefits and advantages of his discovery. When once accepted, it was but a short time before this discovery became known everywhere, and the name of Jenner was enrolled prominently among the great men of the world. Honors were now heaped upon him; he was made an honorary member of all the principal learned societies of the world, while the English Parliament voted him grants aggregating one hundred and fifty thousand dollars.

It will now be in order to examine into the manner of action of vaccination, and to ask *how* it affords protection.

In this connection, it will be possible only for us

to understand the facts ; the minute questions and reasons why these facts are facts, will, I fear, ever remain an impenetrable mystery.

Smallpox belongs to a class of diseases known to the physicians as “ Zymotic diseases.” This means a disease that is produced by a species of fermentation in the blood. The active poisonous agent is introduced into the body, and meeting in the blood with some necessary elements (the nature of which we know not) a sort of fermentative change takes place, and the resultant product of this process is the particular disease under consideration.

For this change to be produced it is necessary that the poison introduced from without should find some suitable elements, a favorable condition of the blood, for its development into the disease. If this condition is not present the disease cannot be produced, no matter how much of the poison may be introduced. It falls upon barren ground, as it were, and its power for evil becomes absolutely nil.

This will explain to you the apparently mysterious fact that while a given number of persons may be exposed to contagion, yet only a limited number are afflicted with the disease, since the blood of the rest

happens to be in such a condition that it will not furnish the necessary elements for development of the poison.

Thus, then, you will be prepared to understand that for the development of smallpox in an individual, two conditions are absolutely essential, and without them the disease cannot exist.

First, the poison must enter the system, and secondly, having gained access to the blood it must find therein conditions for its growth and development. It must be planted in good soil, suitable to produce a crop of smallpox, as it were, else, like vegetables planted in unsuitable ground, you will never see any more of it. What these conditions are, of course, we do not know ; science has not yet been able to penetrate this mystery, and we can only determine the presence of this state of the blood in one of two ways, either by exposing ourselves to smallpox, when, if they exist, we will take the disease—a very bad and not to be desired test—or by vaccination.

You will now be almost prepared to anticipate me when I say that vaccination confers immunity from smallpox by so altering the condition of the blood that when the poison of the disease is introduced sub-

sequently, it falls upon uncongenial soil ; it does not find the necessary conditions, and the disease is not developed. So thought Jenner, and such has subsequent experience proven to be the case.

When a person is vaccinated successfully, the matter placed on the abraded surface is absorbed into the blood and produces a constitutional disease known as *vaccinia*. It circulates throughout every portion of the body, and hunting up the various elements necessary for the development of smallpox, alters or destroys them. It is at the present time a mooted question whether *vaccinia* is a distinct disease or is a modified form of smallpox. This, however, is of no practical moment, since we do know that it possesses the alterative or destructive power described, and this is what we desire. It may be a matter of scientific interest or curiosity to determine the identity or non-identity of the two diseases, but for all practical purposes we know now as much as we require.

So, then, vaccination affords protection from smallpox, by producing in the body a constitutional disease, which runs a regular course, that is similar to and possibly identical with smallpox itself, but of a

character so mild as to be utterly and entirely harmless, but which so alters the condition of the blood as to render the development of the disease itself in its more virulent form almost an impossibility and certainly a very great rarity.

For many years previous to Jenner's great discovery an operation for protection against *smallpox* was resorted to, which was known as *inoculation*. It consisted of inserting beneath the skin some of the matter from a smallpox sore, which produced in the person so inoculated true smallpox, but of a type so mild as to prove but very rarely dangerous, while at the same time, it afforded, in the large majority of cases, protection against a subsequent and more severe attack of the disease. This practice of inoculation was in vogue in very early days. The Chinese had resorted to it more than twelve hundred years ago, and according to Collinson * it was in use in Persia, Armenia and Georgia many centuries since.

But since inoculation really produced smallpox, it proved to be more of an evil than a benefit, because when one man, say, was inoculated and

* Smallpox and Vaccination Historically and Medically Considered.

received smallpox, he might be the means of communicating the disease, in an aggravated and fatal form, to many who had not been inoculated ; because, as you can understand, the man who had been inoculated successfully had smallpox as truly and completely as any one could have it, only it developed less dangerous symptoms, and was much less likely to prove fatal than when contracted in the ordinary way. Still it was and is a fact, that a man with a *walking* case of smallpox can communicate a fatal attack of the disease to some neighbor. Hence these inoculated persons were deadly enemies going about among their fellows, and carrying disease and death to all who had not been inoculated. Had every person been inoculated, then indeed would this procedure have been a blessing, and surely would it have prevented the ravages of smallpox. But such not being the case, inoculation became more of an evil than a blessing, since it tended to perpetuate and even to increase the afflictions of smallpox. Hence inoculation was unsatisfactory, and being pronounced injurious, fell into disuse :—

Soon after the true danger of inoculation was recognized, Jenner made his great discovery, which

in substance is as follows, as stated by Jenner himself in his "*Inquiry into the causes and effects of the Variolæ Vaccinæ*," published in 1798:—

1st. This disease (vaccinia) communicated to man has the power of rendering him insusceptible to smallpox.

2d. That the cowpox or vaccinia might and can be communicated from the cow to man.

3d. That the cowpox once ingrafted on the human subject might be continued from individual to individual by successive transmissions, conferring on each the same immunity from smallpox as was enjoyed by the one first infected direct from the cow.

In other words, it was and is believed that the artificial production of cowpox in the individual so alters some of the constituents of the blood, that even though the poison of true smallpox may be introduced therein, it will not find the elements and conditions there necessary for the development of the disease, since the poison of cowpox has destroyed or altered these elements or conditions. So, then, vaccination confers immunity from smallpox by altering the condition of the blood from that favorable to its development to a state in which its production is

impossible. In this belief the world was happy for many years, believing, as it had good reasons to, that at last had been discovered a means by which this terrible disease could be driven out of existence. They were undoubtedly right in this belief, if subsequent experience is to be relied upon.

Human nature is ever restless and uneasy, however, and some one must always be agitating and discussing every question that exists, while, unfortunately, there are and ever have been many narrow-minded men, who, viewing a subject only from their own standpoint, and neglecting to go around and inspect the other side of the question, have judged partially and unjustly, when, I am sorry to say it, they find all too many men ready to blindly follow the erroneous and pernicious doctrines that they promulgate.

For many years vaccination was accepted by the universal world as an almost absolute protection against smallpox. Lately, within a very short time, some German physicians have raised a hue and cry against this beneficent and divine discovery, and have attempted to cast it into disrepute.

The agitation has been taken up in England and has gained many adherents, while in this country the anti-vaccination fever has but just commenced,

and will require heroic treatment to throttle it in its infancy, ere it gains strength and vigor.

The anti-vaccinators have undoubtedly some good reasons for their course, but they fail to make a distinction between the end to be acquired and the means by which this end is accomplished. Because vaccination does in some cases, and, unfortunately, in a good many, produce worse evils than smallpox itself would or could, therefore they reason that vaccination is wrong and should be abolished. They condemn the entirety without considering or endeavoring to correct the particulars that make this entirety dangerous.

That there are certain dangers to be dreaded, that certain evil results can and do occur from vaccination as practiced to-day, no reasonable man will or can deny. Whosoever has had experience with vaccination must oft and again have found this to be too true. The fault, however, does not lie with *vaccination*, but is to be found in the vaccinators, who perform their work incorrectly and with improper material. Many good things have fallen into disrepute and disuse through the fault of man, and not through any inherent short-coming in the thing itself. Vaccination is a remarkable illustration of this truth.

DOES IT PROTECT ?

PART SECOND.

ARGUMENTS IN FAVOR OF VACCINATION—HOW TO VACCINATE.

“ To vaccinate or not, that is the question !
Whether 'tis better for a man to suffer
The painful pangs and lasting scars of smallpox,
Or to bare arms before the surgeon's lancet,
And, by being vaccinated, end them. Yes !
To feel the tiny point, and say we end
The chance of many a thousand awful scars
That flesh is heir to—'tis a consummation
Devoutly to be wished. Ah ! soft, you, now,
The Vaccinator ! Sir, upon thy rounds
Be my poor arm remembered.” —*Punch*

Our humorous friend, *Punch*, concisely puts the question that is to-day agitating medical minds, when he says “*To vaccinate or not.*”

We will now see whether vaccination does really afford protection against smallpox. In order to form a correct estimate of the subject, we will select from current medical literature the opinions and experiences relating to the question, and allow you to draw your own deductions from them.

The *British Medical Journal* says: “The wicked-

ness of encouraging the anti-vaccination agitation could not, it is opportunely pointed out by the *Globe*, be more strikingly proved than by an account it printed of an outbreak of smallpox at Rotherhite. 'A leading anti-vaccinator, Escott by name, who had none of his children vaccinated, has lost his wife and two children by smallpox, and four others have had the disease. Escott borrowed a suit of mourning from a friend, named Angus, to attend his wife's funeral, and returned the clothes without disinfection, with the result, that the lender caught smallpox and died. Since then, nearly every house in the neighborhood has been attacked, and sixteen patients have been removed to the hospital.' " This is a striking case, but I will give you so many more, that I imagine I will make out a conclusive and convincing case in favor of vaccination.

Dr. E. S. Snow, of Providence, commenting, in the *Medical and Surgical Reporter*, of Philadelphia, on the prevalence of smallpox in our city during 1881 says: "No principle of sanitary science is more positively established than this, that there is an absolutely certain individual preventive of smallpox, which is easily obtainable and easily applied. The

whole question of the arrest of this disease, at any time and in any place, is simply the question of the faithful application of this preventive, with other suitable well-known sanitary measures." This individual preventive is none other than vaccination with suitable virus.

Dr. Schuyler reports the careful records of one hundred and ninety-nine cases of smallpox treated by him in the Troy Hospital. Of this number, only seventeen had been vaccinated, and of this seventeen only two died. While of one hundred and five who had not been vaccinated, thirty-three died. He notes that *not a single case*, having a *recent vaccination*, was admitted during his service, and concludes by expressing his belief in the absolute protective power of vaccination.

I will now produce a strong argument from the home of anti-vaccination. In consequence of the aggressive action of the Belgian Anti-vaccination League, the Belgian Academy of Medicine appointed a committee of three members for the purpose of undertaking an exhaustive examination of the whole subject. At the conclusion of their labors, M. Warlomont summed up the results as follows :—

1. Without vaccination, hygienic measures and means, whether public or private, are powerless in preserving mankind from smallpox.

2. The belief in the danger of vaccinating and re-vaccinating during the presence of a variolous epidemic, is not justified. We can no more cultivate variola by sowing vaccinia, than we can barley by sowing wheat.

3. Vaccination is always an inoffensive operation when practiced with proper care on healthy subjects. It gives rise to fewer and less serious accidents than simple piercing of the ears.

4. It is highly desirable, in the interests of the health and lives of our countrymen, that vaccination should be rendered *compulsory*.

You will notice that this report does not claim that vaccination never does harm, but it is careful to say that "when properly performed, it gives rise to fewer and less serious accidents," etc. No just man will claim that this operation *never* does harm, because sometimes it unquestionably does, but we can claim that the instances in which it is injurious are so infinitely few, compared with the large number in which it does good, that they cannot constitute a valid objection

to its use. Railroads often cause serious accidents, yet they are so clearly to the benefit of the large mass of mankind, that they are encouraged. So, although vaccination may, even when properly performed, very occasionally prove disastrous, yet in such a very large majority of instances does it do good that it ought to be encouraged.

From far-off India comes a most convincing argument, which I quote from a medical journal. "Although the epidemic of smallpox visited the northwestern provinces of India in a fearful manner, causing 58,800 deaths in the single year of 1878, all attempts at introducing vaccination as a protective measure were resisted by the superstitious natives. They looked upon smallpox as a visitation from a Deity, called by them *Sitta*, whose anger had to be appeased with special sacrifices and plagues. The faithful Hindoos considered it an act of impiety to still further incite the wrath of this deity by the administration of unholy medicines or vaccination. In spite of all this, however, vaccination, although under peculiar circumstances, was gradually introduced among the natives. The Thakers, a tribe that

still practices infanticide to a horrible extent, first allowed their female children to be vaccinated, being convinced of its fatal termination, and hoping thereby to get rid of this superfluous progeny. All the sons, however, were carefully guarded against vaccination. Smallpox broke out in four of their villages a short time afterwards, which carried off nearly all the boys, whilst the girls escaped the disease. This unlooked-for termination induced the natives to resort to the opposite practice, compelling the boys to be vaccinated, whilst the girls were left unprotected. Besides this, a large number of cases were observed where children were concealed by their families from the vaccinators; in almost all instances these died, whilst those vaccinated escaped smallpox." Even one such remarkable and unanswerable illustration as this should convince every one of the utility of vaccination, but I have only commenced my arguments, and will continue to give you many more interesting ones.

Dr. Welch, physician-in-charge of the Municipal (smallpox) Hospital of Philadelphia, in the course of an address on vaccination says: "In Sweden, during the pre-vaccinal period, from 1774 to 1801,

the annual average of deaths per million of inhabitants, from smallpox, was 1973; after vaccination was introduced, but was not obligatory, 1802-1816, the annual average per million inhabitants was 479; and after vaccination was made compulsory, during the period from 1817 to 1879, the annual average of deaths from smallpox per million of inhabitants was only 181. This shows an annual saving of life of 1792 persons out of every million of the population by vaccination, and fully justifies the law making it compulsory."

Statistics collected by Mr. Marson during a service of thirty years in the Smallpox Hospital of London, show that out of 15,000 cases the unvaccinated died at the rate of thirty-five per cent., while among those who had been vaccinated the death rate was only six and one half per cent.

Again, in Dr. Welch's experience of four thousand cases, the unvaccinated died at the rate of sixty per cent., while among those who had been protected by vaccination the death rate was only ten per cent. Still further, he says: "During the last twelve months I have had under my care at the hospital twelve hundred cases of smallpox, and of this number *only*

one had been *recently vaccinated*, and this case terminated in recovery."

In Germany vaccination is regulated by law, and when a man enters the army he is re-vaccinated. During the Franco-Prussian war, when the German army was double the strength of the French, there were only two hundred and sixty-three deaths from smallpox among the Germans, while among the French (with whom vaccination was not compulsory) the loss from this disease aggregated the enormous total of twenty three thousand three hundred and sixty-eight. A very striking example of the value of re-vaccination is furnished in the *British Medical Journal*. Some years ago, when smallpox was very prevalent, the surgeon of a large sailing vessel discovered, when a few days out at sea, that the captain had secretly conveyed on board the vessel his son, who was suffering from confluent smallpox. The surgeon at once procured all the vaccine lymph that he could, and re-vaccinated as many of the crew as possible. One-third or one-fourth of the crew remained unvaccinated. Of the re-vaccinated *not a single one* caught the disease, while among those who were not vaccinated *all, or all but one or two*, caught the disease, and three died.

Dr. John L. Atlee, of Lancaster, bears testimony to the wonderful power of vaccination in the following statement, conveyed in a letter to his son, Dr. Walter F. Atlee, of this city. He says: "I have tested the efficacy" (of vaccination) "by inoculating for smallpox after vaccination ; have taken patients after vaccination to cases of malignant smallpox in small and hot stove rooms, and exposed them to the foul atmosphere for fifteen or twenty minutes, secure from danger. In one case of a mother, with six unvaccinated children, one at the breast, who had a severe attack of smallpox, as soon as I discovered the nature of the case, I vaccinated all the children and they all took the vaccine disease. The room—it was in February—was a small ten by twelve feet room, with a hot ten-plate stove, and but one bed, on which they all slept, and which was saturated with smallpox contagion ; yet these children picked off the scabs from their mother's body and the baby nursed at her breast, and no one took the smallpox."

Owing to the violent opposition displayed by the anti-vaccinators in London, the National Health Society has issued and distributed twenty thousand

pamphlets, and are sending out more, in which conclusive evidence is furnished of the following points:

1. That vaccination is the only available means of protection against smallpox.

2. That with due care in the performance of the operation, no risk of injurious effects from it need be run.

3. That before its discovery the mortality from smallpox was forty times greater than it is now.

4. That in the London Smallpox Hospital the records show a rate of mortality of less than one per cent. for well vaccinated persons, against a rate of thirty-five per cent. for the unvaccinated.

Sir John Pope Hennessey, Governor of Hong Kong, says that while no port is more liable to the introduction of smallpox, yet it never *spreads* there ; and this blessing he attributes to the fact that the Chinese so firmly believe in and so faithfully practice vaccination. The native doctors of the Tung-wa Hospital not only vaccinate their countrymen in the colony itself, but actually send traveling vaccinators over the adjoining provinces of China, so firm is their belief in its protective power.

The *North Carolina Medical Journal* for June, 1881,

furnishes a striking illustration of the protective power of vaccination, and although you may consider that I am furnishing too many illustrations, yet I desire to give all the important information I can gather on the subject, in order that the question may be completely and thoroughly put before you. It says: "Few commercial towns for a long time escape visitations of smallpox, notwithstanding that it is the most preventable of all diseases, and smallpox having once made its appearance, is seldom limited to the introduced case.

"An example of complete success in limiting smallpox to the original case (or cases, we should say) came under our observation recently. A vessel from New York, loaded with guano, had a case of smallpox on board. The disease made its appearance at sea, in the person of a son of the captain. The young man was taken into the cabin and nursed there by his brother, who was a mate, and by the steward. Arriving at the Cape Fear quarantine station, the vessel was made to set the signal for the quarantine officer, for the steward, who had acute rheumatism. In the meantime, the case of smallpox was convalescent, and the eruption on the face and

hands was accounted for by the action of the guano fumes. The vessel was permitted to come to Wilmington, and the steward was admitted to the Marine Hospital with rheumatism. The convalescent smallpox patient did not come under the observation of any medical man. For, as the friends of the patient afterwards declared, having passed the quarantine physician at Smithville, they assumed that the case was not smallpox but chickenpox, and consequently the young man attended church and enjoyed unrestricted intercourse. About the tenth day after the admission of the Steward, for rheumatism, he was seized with fever and pain in the back, followed by eruption on the forehead. The Superintendent of Health was notified within an hour after the eruption was noticed, and deciding that it was smallpox, preparation was made for the removal of the patient to the smallpox hospital, four miles below the city. In the ward where the disease made its appearance there were eleven other patients, of Scandinavian and German nationality, except one elderly negro. It is well known that vaccination among the Germans and Norwegians is most thoroughly done, and so the vaccine cicatrices

indicated in these cases. Nevertheless, it was considered necessary to revaccinate all of them with *Animal Virus*, this being designated by the law of the State. All the vaccinations took, with but one exception. In the Seaman's Home, a building connected with the hospital by an entrance-way, there is a boarding house. Every one there was carefully vaccinated. To provide against the risk of an outbreak resulting from the intercourse of the convalescent case of smallpox with his friends on shore, the Superintendent of Health vaccinated unsparingly. The case at the smallpox hospital resulted favorably, and the whole affair terminated *without the occurrence of another case.*"

An editorial in the *Chicago Medical Review* of November 5, 1881, thus bears testimony to the efficacy of vaccination: "It is almost unnecessary to say that cleanliness in person or surroundings has no influence on smallpox infection. The doctrine that cleanliness is more important than vaccination has been expounded by some of the medical lights of this neighborhood. They, however, forget, or never have been acquainted with, the history of modern epidemics. The experience of Andersonville

prison, where something like sixty thousand prisoners were confined in a filth appalling in character and extent, demonstrates this position. Smallpox was twice introduced into that pen, but extensive and thorough vaccination at the date of enlistment prevented the spread of the disease. Not more than a dozen deaths occurred. In modern European armies the same facts have been observed. *In successful vaccination, and in vaccination alone, their safety lies."*

While this editorial rather belittles the influence which filth exerts indirectly on smallpox production and perpetuation, yet it is, in the main, correct, since no matter how clean and pure a person or locality may be, yet without vaccination, smallpox is more than a possibility; it is indeed a probability. The Louisville *Medical News* of March 19, 1881, tells us that "Dr. Turner Anderson delivered a child while the neck and face of the mother were covered by the eruption of smallpox. He vaccinated it immediately, on both arms. The result was most favorable."

Among other conclusions on this subject arrived at by the Académie de Médecine of France is the

important one, that "without vaccination, hygienic measures (isolation, disinfection, etc.) are of themselves insufficient for preservation from smallpox."

From another source I learn the astounding but satisfactory and comforting fact that Dr. Buchanan, the medical officer of the London Government Board, has issued his statistics, which show that the smallpox death rate among adult persons vaccinated is ninety to a million ; whereas among those unvaccinated it is 3350 to a million. Among vaccinated children under five years of age forty and one-half per million ; whereas among unvaccinated children of the same age it is 5950 per million.

The lower classes in the Island of Madeira are exceedingly hostile to the practice of vaccination, and the *Pacific Medical and Surgical Journal* tells us that six years ago smallpox prevailed there and carried off one thousand persons out of a population of one hundred and thirty thousand.

Macaulay thus graphically describes the ravages of this disease, at the close of the seventeenth century : "The smallpox was always present, filling the churchyards with corpses, leaving on those whose lives it spared the hideous traces of its power,

turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover." How vaccination has changed this picture every one knows full well.

Still, the *Public Ledger* recently said, editorially, "The world is getting on pretty near the close of the nineteenth century, and yet it appears to be necessary for skilled physicians and sanitarians to make formal argument before a committee of our city Councils to convince Councils that vaccination is a safeguard against the fatal ravages of smallpox! A hundred years of accumulated experience seems to have gone for nothing."

One of the foremost physicians of America, Dr. N. S. Davis, of Chicago, believes that an immediate re-vaccination is the surest test of a successful vaccination, since if it does not take the second time it is sufficient proof that the first has been successful, and he considers that if this precaution were observed "*not one in a million would take smallpox.*" He adds that if compulsory re-vaccination were enforced it would stamp out the disease.

Have I not adduced sufficient evidence to con-

clusively prove that when properly and successfully performed vaccination does afford immunity from smallpox? If I have, how, then, can any one have the hardihood to deny himself this immense protection, to be procured from so trivial an operation.

Is it that we do not thoroughly realize the dangers and the horrors of the disease, or is it that we are careless about means of preserving our health until that valuable health becomes impaired? I am inclined to think that both of these elements conspire to produce the comparative apathy existing among the public in connection with this protective operation. The general mass of the people see so little of the ravages of the disease, unless it happens to enter their own household, that they do not realize its horrors. They are so little acquainted with the infinite number of avenues of contagion that they do not fear, half as much as they ought to, that they may themselves take the disease, and until it is brought very near home to them they fail to avail themselves of the immunity which vaccination confers.

I will relate three instances, which, kept before

your minds, will assist you to realize the horrors and the dangers of the disease.

1. A man in Jersey City recently died of smallpox. When the Health Officer went to examine the house he found the widow lying on a bundle of rags on the floor, and she, too, was dying from the same disease. On her right hand lay a boy of seven, dead, while on her left was the dead body of a girl of five. In the corner were two more children sick with smallpox. Can you conceive a more horrible sight? None of this family had been vaccinated. Now, contrast this case with that alluded to as reported by Dr. Atlee, in which six successfully vaccinated children slept in the same bed with their mother, when she was suffering from confluent smallpox, and none of them ever took the disease. This illustrates the *horrors* of smallpox. The next cases will illustrate its contagion.

2. Two ladies in Philadelphia kept a boarding house; one of them was taken sick with smallpox; she died. Ten days subsequently the servant who nursed her was taken sick and died.

3. Recently, at the town of Gratz, near Harrisburg, a prominent citizen died of smallpox; the nature of

the malady having been kept secret, the funeral was largely attended ; in a few days three children were taken with the disease, and in a very short time seventeen of those who attended the funeral were down with the disease and new cases were being reported.

Of all diseases, smallpox is, probably, the most violently contagious, and, unlike other terrible diseases, it is not content with killing many persons and destroying many happy homes, but upon those whose lives it spares it forever leaves its ineffacable warning to others ; a warning that speaks louder than words, a caution so strong that it ought to do more in favor of vaccination than the greatest eloquence of the most wonderful orators, or the written accumulations of the most facile and convincing pens.

It would really seem as though men valued their live stock at a higher rate than they do their own flesh and blood. Recently M. Pasteur, a distinguished scientist, has discovered a method of vaccination by which sheep, hogs, horses and other live stock can be given immunity against a very fatal disease that is oftentimes very prevalent among them. When his

discovery was made known, farmers from all about came flocking to him in large numbers, to have their animals vaccinated, so that in a short time more than fifty thousand were thus given protection in the suburbs and near vicinity of Paris alone.

And yet, these very men, who feared lest they might lose some money by the death of their sheep, and who so hastily and greedily availed themselves of protective vaccination for their stock, are evidently so careless about the welfare of their human stock, of their own children, that in this very country, where such a prodigious number of the lower animals have been protected, it has been found necessary to compel human vaccination by legislative enactments.

What a commentary on human nature, when a civilized and enlightened nation like France, though verbally denying the indictment, yet by action admits that to them, money, and live stock, as representing money, are of more value, are in reality nearer and dearer to their hearts, than their own offspring.

Does it not seem almost incredible and beyond the possibility of belief, that in this enlightened age of mental and material progress it should become neces-

sary to *compel* persons to avail themselves of the protection which my arguments must tend to show vaccination does confer. I doubt not that if you were to ask any man if he would not consider it a great blessing if some means could be devised by which smallpox could be eradicated, he would answer, *indeed I do*, most emphatically, and without the slightest hesitation. Yet, when such a means has been devised, does exist and is to be so easily procured, they keep putting off until it is too late.

I feel confident that if the most devout and persistent anti-vaccinator in the world were laid up on his back with a virulent case of confluent smallpox, if he told the truth, he would cry out, from the very innermost recesses of his soul, his regret for having neglected the protection he could so easily have procured. You all know the old saying, "*When the devil was sick, etc.*" This is applicable to the anti-vaccinators in a marked degree.

While they have some arguments for their side, (which I will fairly present) yet I cannot bring myself to believe that any one of them, who is sincere, really does not believe in the protective power of vaccination. If they would confine their agitation

to the endeavor to reform the evils of the present system of vaccination, they would receive the hearty support and co-operation of the respectable medical profession and of every honest, thinking man. But when they endeavor to create an absolute disbelief in this protective power, or when they endeavor to maintain that vaccination does more harm than good, they assume the relation that Don Quixote once held to a windmill; they are battering against an impregnable barrier in their endeavor to reach their goal; they are fighting an invulnerable and invincible foe, since they will ever find arrayed between them and the consummation of their iconoclastic campaign a solid and impassable phalanx, composed of nearly the universal medical profession of the world, supported by the mass of intelligent, thinking laymen, who will keep vaccination alive and afloat till this storm of prejudice and misrepresentation shall have expended its fury, when they will guide it into port, to be welcomed once again by the hosannahs and the hallelujahs of a grateful and eager world.

I doubt not that some persons may say that they thought that vaccination was very universally re-

sorted to, and that they do not understand why I should take such a position.

A few words will disabuse them of this erroneous idea, and may perhaps enlist their co-operation in making it universal. It is true that the anti-vaccination storm has not yet reached our country in its full force, but its advance agents are already among us, and unless we show them by a very determined stand that such ideas are obnoxious and will not be entertained, we will soon have the anti-vaccination agitation in full force among us.

The present epidemic of smallpox, taken in connection with the arguments adduced in favor of the protective power of vaccination, is one proof that it is not universally resorted to, else, if it were, we would not have this epidemic.

Still more, I recently received a pamphlet, written by a physician, in which he endeavors to show that vaccination not only does not afford protection from smallpox, but he even goes so far as to say that this operation is productive of more evil even than smallpox itself. This is one of the forerunners of the anti-vaccination storm. Some of his arguments are good as far as they go, but they do not go far enough. He and those who agree with him fall into

the error of universally condemning an entirety, without looking into and endeavoring to correct the faulty particulars that make this entirety seem dangerous. Some of his objections will be noted and explained away in the next part of this book.

It will seem strange, no doubt, to many of my readers who already firmly believe in vaccination, that so much skepticism should exist concerning it; but the fact is that such doubt does obtain, and we might as well stare it in the face, admit its existence and endeavor to stifle it in its infancy. How to do this I will suggest further on.

A few words on how to vaccinate will now be in order, but only a very few, since, entering upon this question, I am encroaching upon the territory of the physician, which I have neither the right nor the inclination to do in a popular treatise.

The essential principle of the vaccine virus gains entrance to the system in the operation by being absorbed from the abraded surface of the skin. Grossly speaking, the skin consists of two layers. In the operation for vaccination the outer layer is scraped off, leaving exposed a raw surface or space on the lower layer or true skin, which possesses the power of absorption. The vaccine

material mixed with water is then placed on this raw surface, from which it is absorbed into the system. It matters not how this abrasion is secured, the point being to remove the outer skin. It is not necessary to bring blood, indeed, it would be better not, since it is possible that the blood may clot on the surface and offer a mechanical impediment to the absorption of the vaccine matter, though this latter is not likely. But to repeat and impress on you, the essential consideration in the operation is to secure the removal of the outer skin.

It matters not what portion of the body is selected for the operation ; one is as good as another, so far as the efficacy is concerned. The left arm above the elbow is usually selected, but simply as a matter of convenience, since that portion can be more easily given the rest and quiet so essential to an inflamed and sore spot.

It must be remembered that a successful vaccination will sometimes produce very marked constitutional symptoms, and will oftentimes make a person so sick as to compel him to go to bed. It will also produce a very painful local sore, with much inflammation, that will require absolute rest of the part and the application of soothing lotions. Some parts of

the body can, of course, be more readily placed at rest than others, hence they should be chosen, since a disregard of this precept may give rise, in some cases, to very troublesome and painful complications. A prominent operatic singer was recently vaccinated in the West. She objected to having the operation performed on her arm, on account of the disfigurement which the subsequent scar would entail; the thigh was decided upon and the operation was there performed. She was cautioned to be very careful of the limb and to exercise it as little as possible. The vaccination took. For some days the lady was very careful; but one night, receiving an enthusiastic reception from a very large audience, she was carried away, and forgetting her caution, endeavored to act her best, with the result that she was laid up in bed for two days with a very sore limb.

Therefore I would advise all to follow these few simple directions. Select that portion of the body which you are sure you can keep most at rest, and when the vaccination commences to take, if the arm or part is very sore, keep applied to it a rag smeared with some greasy substance; you may use for this purpose cosmoline, vaseline or even plain lard, which will do as well as anything.

It will be well, before concluding these remarks in favor of vaccination, to summarize the points we have given, so that you may, if you so desire, commit the digest of them to memory, and have ever ready, at your tongue's end, the conclusions of the majority of physicians, with which you may answer the arguments of anti-vaccinators, or confirm the wavering of any friends who may have a tendency to take up with their views. These, then, are the conclusions of the advocates of vaccination. That in the large majority of cases, when successfully performed with proper virus, it does afford protection from smallpox. That in those few cases, comparatively speaking, in which it does not afford absolute immunity, it so modifies the intensity of the disease that it rarely proves fatal. That *pure* bovine virus is to be preferred to that from the human subject, since it absolutely prevents the passage of extraneous diseases from one to another. That the proportion of cases in which this operation proves a benefit is so greatly in excess of those in which it is injurious, that it becomes, not only justifiable, but greatly to be desired.

PART THIRD.

ARGUMENTS AGAINST VACCINATION.

After presenting such overwhelmingly strong arguments in its favor, it will now be in order to ask, why does any one attempt to cast disrepute and obloquy upon such a self-evident benefit to mankind, and upon what ground can anti-vaccinators stand?

They have, indeed, very strong arguments, and so far as they go, very sensible ones; but, as I have already intimated, the validity of their objections can be upheld only when they condemn the usual methods of vaccinating, and are valueless when they attack the protective power of properly performed vaccination. The platform upon which anti-vaccinators stand has, in reality, only two props or supports, and I hope to be able to demolish them and drop the platform, with its occupants, into a belief in vaccination. These two points are—

1. The fact that, in some instances, vaccination does not confer immunity from smallpox.
2. That various diseases can be transmitted from

unhealthy persons, through the medium of vaccination, to those previously healthy.

These two objections undoubtedly do exist, and are strong points as far as they go ; but when viewed impartially, and in connection with the favorable evidence I have furnished, they only tend to prove that the fault lies not with vaccination itself, but with the vaccinator.

We will take them up in turn and see the correctness of this proposition.

1. Undoubtedly, vaccination does, in many cases, fail to afford immunity from smallpox ; for two reasons.

(a) There is no universal rule in nature. There is no law without its exception. Every sensible man knows, realizes and daily experiences this fact. Neither Jenner nor his most ardent disciples ever claimed that vaccination would, in *every* case, protect from smallpox. There must and ever will be exceptions to this, as to every other natural law. But they do claim, and experience substantiates this claim, that in the vast majority of cases, when properly performed, with good material, and it is successful, it does afford protection.

(*b*) Great carelessness and even criminal fraud exists, to an inexcusable extent, in the production and selection of vaccine virus, and in the performance of the operation.

The story is told of a physician, who, when visited in his office by a stranger, to be vaccinated, not having any virus on hand, and fearing to lose his fee, mixed up some gum arabic, and vaccinated his unsuspecting victim with it, telling him that if it did not take in a week, to return, and he would do it over again. No doubt similar cases have repeatedly occurred, and since, in some persons, the mere scratching of the arm might make a *sore* with a subsequent *scab*, and since the general public does not know how to recognize a successful vaccination, believing that a mere *sore arm* is sufficient proof that it has *taken*, they consider themselves protected, do not return to the doctor, and subsequently taking small-pox, another case is added to the list of unsuccessful vaccinations.

This same insufficiency in the protective power of the material used, from various causes, unnecessary to mention here, has tended to cast distrust upon vaccination, when the fault really lies with the physician.

It is unnecessary, and would be tiresome, to here detail the numerous reasons why some virus possesses no protective power. Suffice it to say that such is an unquestioned fact, and to suggest a remedy, which I will do further on.

2d. That various diseases have been and can be transmitted from one to another, through the medium of the vaccine virus, is a pretty generally accepted proposition. But here again the fault lies with the material and the carelessness or criminality in its propagation and supply, and not with the operation itself.

When a *conscientious* physician desires to procure a supply of vaccine virus, he goes to some druggist, *in whom he has confidence*, and buys some ivory points coated with bovine virus, or he procures from some brother physician (also conscientious) a scab taken from a child who was believed by this doctor to be perfectly healthy. In many instances, indeed in nearly all, the material thus procured will be pure and efficient, will confer immunity from small-pox, and will not contain the seeds of any foreign disease. But it is impossible for the most careful druggist to avoid occasionally receiving some impure

points. The desire for money and to make it easily, to derive unnaturally large profits from all business operations, is so inherent in human nature, that adulteration, in order that expense may be lessened and profit increased, has even entered into the business of supplying vaccine virus.

In order not to be too personal I will make no mention of locality or names in the story I am now going to tell, but will assure you that it is true.

I have been informed by reliable authority that a physician of this city is in the habit of collecting all the scabs from vaccinated persons that he can get and forwarding them to a neighboring city, near which are several vaccine farms. Of course, I do not know what is there done with them, but it would not require a very great stretch of the imagination to suppose that they are mixed with water, and ivory points, coated with the mixture, dried and shipped over the country as "*genuine bovine virus direct from the cow.*" Still worse, I have been informed on good authority that an extensive and generally-considered reliable drug firm in this city buy scabs directly from physicians, and in their own establishment mix them with water, coat ivory points

with the mixture, and sell the same to unsuspecting physicians (upon whom they fawn and into whose good graces they insinuate themselves, by a miserable, cringing sycophancy) as *pure bovine virus, direct from the vaccine farm*. This firm, by a number of years of plausible catering to physicians, have worked into their confidence and built up an extensive trade, so that any material coming from their store is generally considered irreproachable.

Is it any wonder, when such outrageous practices are resorted to, that vaccination meets with opposition. It is enough to make the blood of an honest man fairly boil with indignation when he hears that a firm making more than fifty thousand dollars a year will resort to such a contemptible device to add a few dollars to their profits. Neither is it a harmless device, since, as we will see further on, this firm and such other mean, contemptible puppies as they are, may be the means of spreading abroad the most loathsome diseases among their unsuspecting fellow citizens. We will be charitable enough to trust that they do not realize the true nature of their nefarious traffic, else how could they sleep of nights.

Again, it is a fact, that many persons contain in

their systems the seeds of some disease, when to all outward appearances they are perfectly healthy. A scab derived from such a person, and honestly believed to be perfectly harmless and efficient, may, unfortunately, in the person vaccinated with it, develop some terrible disease.

Again, in the medical profession, as in every other calling, the majority of men are not hampered with any too much conscience. They want to make money, and are not overly particular how they get it; the end, in their imagination, justifies the means. Hence, any scab or any virus is good enough for them. They are not very particular as to its purity or efficiency. In this way, no doubt, much misery is caused and very much undeserved censure and condemnation is heaped upon vaccination.

Here, then, we have concisely and illustratively stated the two arguments upon which anti-vaccinators base their case. To sum up: The facts that, in some cases, because of carelessness in selection of material, vaccination fails to confer protection, and in other cases produces disease nearly or quite as bad as smallpox itself.

These two arguments, as far as they go, we must

and do cheerfully concede to the anti-vaccinators. But they are very weak, and prove nothing for their case. The fact is sufficiently answered by the admission made, that no law is so absolute and universal as to be without an exception—unless, may be, as is popularly said, in the cases of taxes and death, and we might add the law that a note will be protested if you fail to pay it. The second argument constitutes one of the *abuses* of vaccination, and has no weight to prove anything more than the corrupt and mercenary nature of that portion of mankind who are depraved enough to resort to such base and villainous practices.

The fact that the instances in which vaccination fails to afford protection are the exceptions, has been sufficiently demonstrated by the arguments already adduced.

Therefore, at the risk of repetition, we must regard the arguments of those who oppose vaccination as being based upon wrong premises, since they use the exceptional cases and the abuses of the practice to point their arguments.

One other argument, which probably ought to be mentioned, upon which our opponents base their case,

is that vaccination is prone to produce erysipelas. In answer, we might admit that erysipelas is produced in every successful vaccination. The disease means an inflammation of what we call connective tissue, that is, the tissue beneath the skin. Now, since successful vaccination does produce a violent inflammation of the skin about the seat of the operation, it is but fair to infer that this inflammation may extend to the tissue beneath and produce a local inflammation of it, or a localized erysipelas, which is trivial and perfectly harmless. As for its ever producing a genuine and dangerous attack of the disease, I can quote the statement of a New York physician, who had vaccinated two thousand persons and had never seen a resultant attack of erysipelas ; and can also say that, after a careful examination of all the medical literature of the past year, I have found but one reported case of erysipelas following vaccination, and in this single instance the disease could not be clearly traced to the operation, since other causes for its development existed.

Here, then, I have concisely, honestly, and conscientiously, stated the arguments advanced by anti-vaccinators, and have endeavored to refute them. I

have carefully scanned all the most recent literature, and these have been the only arguments worthy of notice that I could find.

Since there are strong objections, and since they do qualify and modify the benefits to be expected, and that can be derived from vaccination, we will go on to our next subject and endeavor to suggest a means by which these defects may be remedied, and the full, free, and unalloyed protection that vaccination is capable of conferring be vouchsafed to all.

PART FOURTH.

HOW TO OVERCOME THESE OBJECTIONS.

It seems conclusively established that were vaccination and revaccination to become absolutely universal, smallpox could in time be exterminated. This is truly a consummation most devoutly to be wished for. But how can it be brought about? Only in one way, namely, by *legislation*.

I will suggest a form of legislation, which, if carried into effect, would demolish the platform of anti-vaccinators, and would, beyond doubt, if persevered in, eventually eradicate smallpox. And this suggestion I will make in the form of some points or hints for a bill to be presented to, and acted upon, by the legislatures of our various States.

I would suggest the establishment of a "State Board of Vaccination," who should be given the authority to compel, under penalty of fine and imprisonment, the vaccination of every man, woman and child, in the State. The members of this Board should be elected for life, or good behavior, by the

State Medical Society, and any vacancies that might occur by resignation, death or removal, be filled by the same Society in annual session. By this method of organizing the Board, the damning influence of politics would be kept as remote as possible from the groundwork of our plan. An annual appropriation should be made, sufficiently large to enable this Board to thoroughly carry on its good work.

This Board should commence its work by the establishment of a State vaccine farm; the Superintendent of which should be a physician, and be elected by the Board. The State should be divided into vaccine districts, and an inspector appointed for each, whose duty it should be to constantly watch over the persons in his district, and to report all who had not been vaccinated within the prescribed time to the vaccine physician, who should forthwith cause a notice to be served on such person to call at his office *at once*, and be vaccinated. A vaccine physician for each district should be elected by the State Board, whose duty it should be to vaccinate every man, woman and child, in his district. These physicians should be supplied with virus direct from the State farm, free of cost, under the following

conditions : Once a week, they should each make requisition upon the Superintendent of the farm for as many points as they may require, and should at this time return all unused points in their possession. Each lot of points sent out should have a distinctive mark on each point, and a careful record kept of the destination of each lot, as well as the source from which the virus has been derived. When a person is vaccinated, the point used should be given to him with its distinctive mark. Thus, if any accidents occurred, if any disease was communicated by vaccination, it would be a very simple matter to place the responsibility, through the physician using the virus which has proved disastrous, to the Superintendent of the farm, and if negligence or carelessness on his part could be substantiated, he should be severely punished, besides being removed from office. It should be made a penitentiary offence for any physician, other than the duly elected and authorized vaccine physician of the district, to perform vaccination. No charge should be made for his services. The vaccine physician should be required to keep careful and complete records of all cases vaccinated, and should make monthly reports to the superintendent of the farm,

who should in turn make an annual statistical report to the State Board.

It should be made compulsory for every man, woman and child to be vaccinated every five years. When vaccinated, each person should receive a card like the following: —

This certifies that JOHN BLANK has been vaccinated by me,
on February 1st, 1882.

JAMES BROWN, M. D.,
Vaccine Physician,

1st Vaccine District, State of Pennsylvania.

FEBRUARY 8, 1882.—JOHN BLANK has been seen by me, and his vaccination, performed February 1st, 1882, has been successful.

JAMES BROWN, M. D.,
Vaccine Physician,

1st Vaccine District, State of Pennsylvania.

The District Inspectors should be allowed the authority to inspect this card at any time, and any person not possessing one should be compelled to call on the district physician and be vaccinated. It should be made an offence as great as counterfeiting United States bank notes for any one to fraudulently print one of these cards, and as criminal as forgery for him to write himself, or get any one else to write, the name of the duly authorized vaccine physician to it. As much care should be exercised

in the prevention of counterfeiting these cards as is used to prevent the counterfeiting of money.

It should be compulsory on all to be vaccinated every five years, and a severe penalty should be visited upon all who neglected this provision.

This system of vaccination, when once fairly inaugurated, would work smoothly, and ought not to meet with any opposition. The intelligent classes would have no reason to object to it, since they would have the assurance that they were being vaccinated with pure virus and by competent physicians, while such opposition as might be encountered from the ignorant ought to be neutralized by the strong arm of the law, since, when people are so foolish as to object to that which would be undoubtedly for their good, then indeed does it become necessary to force these foolish people to take care of themselves.

In addition to these measures by the different State governments the National Government would have to do something. I would suggest that Congress empower the National Board of Health to appoint a vaccine physician for every Port of entry, whose imperative duty it would be to vaccinate every

emigrant arriving in the country and every native returning from a foreign trip, unless he could produce evidence (in the shape of the vaccine card already referred to) that he had been vaccinated successfully within five years. A card, similar to the one referred to, should be furnished to each emigrant, and it should be a part of the police duty of every city and town to note the arrival of every new person, to notify the vaccine inspectors of such arrival, and they in turn should take the precaution to ascertain whether or not the new arrival had been successfully vaccinated, and so report to the vaccine physician.

All these officers should be liberally paid, and no charge should be made for vaccination, so that no one could have the excuse "of want of means" to offer in extenuation of non-compliance with the law.

Such is, in a crude form, the only method by which smallpox can be eradicated. It really means *universal vaccination*, and by this universality, and by it alone, can this disease be stamped out of existence, and by it, if faithfully and persistently carried out, can this disease be rendered a thing of the past.

Does it not seem strange and almost incredible that human nature can be so blind to its own interests as to neglect securing the wonderful immunity from a terrible disease that is conferred by so trivial an operation? Still, it is true that many persons do neglect to be vaccinated, and since they are so careless, it becomes the paramount duty of our lawmakers to force them to protect themselves.

Let me urge all classes to seriously consider and act on these suggestions. Let me beg you all to invoke the mighty power of legislation to drive from the haunts of men forever this ghastly spectre that makes desolate so many homes and ruins so many faces.

I will ask the father as he gazes on his innocent and beautiful children, the young man admiring his sweetheart's beautiful skin, the wife her husband's manly beauty, and the brother who takes pride in his sister's comeliness, to agitate this question. Go and see your representatives in the legislature ; it is your votes that send them there ; they must do as you desire, else you can send some others who *will* do your bidding in their places ; insist with them that they must so legislate that you and your neighbors

can be protected from this terrible disease, when protection is so easily attainable.

Do not rest satisfied until you have accomplished this purpose. As surely as the sun rises, smallpox can be exterminated, but it can only be done by universal vaccination with pure material.

When the Almighty has allowed the mind of man to furnish to us such a wonderful and yet such a simple means of preserving health and beauty, does it not seem terribly negligent in us that we do not all avail ourselves of it.

Let us hope that the day is not far distant when from the legislative halls of every commonwealth in this great country shall go forth the glad tidings, "*vaccination is compulsory.*" Then can we confidently trust that the medical historians of the future will refer to smallpox as one of the ancient and extinct diseases, as we of to-day are wont to speak of leprosy, and then can we hope that the one disease will be as rarely met with as the other.

PART FIFTH.

HYGIENE OF SMALLPOX.

Under this heading I propose to give a few hints concerning the means of prevention (besides vaccination) as well as the hygienic treatment of one sick with the disease, and the best means of controlling and preventing its spread. The subject will be divided into two parts. The first will give some hints as to what might be called public hygiene, or the duties that devolve upon city and state officials, while the second will sketch the part that the individual must take in preventing the spread of smallpox.

1. *Public hygiene.* The *College and Clinical Record* of August 15, 1881, contained an editorial from which I will make some selections as pertinent to the subject under consideration. It says: "Should any of our readers or correspondents be in need of a good illustration of the way in which a large, wealthy and comparatively enlightened community, in a position, as regards social and material advantages other than sanitary, second to none in this country,

can mismanage an epidemic of smallpox, we invite their attention to the history of the present epidemic in Philadelphia, which, commencing in 1879, still drags its length along, with every prospect, during the coming fall and winter, of being as virulent as at any time in the history of the city." This prediction we all know has been verified. "Not a month has passed for nearly two years without furnishing its quota of cases, with a large aggregate of deaths. No one doubts that smallpox is a preventable disease, and that epidemics cease under proper sanitary precautions. Some of the causes of a want of efficient management of the epidemic have been, first, the want of sufficient appropriations for the purpose; second, the want of a proper sanitary organization, clothed with necessary power, and finally, a want of moral support from the community, who have been kept in ignorance of the true condition of affairs, by the secular press, lest the publication of the facts might cause the mercantile interests of the city to suffer. Free vaccination is very good, when actively carried on, and proper precautions are taken to insure the use of true vaccine virus. But vaccination is not all. Systematic and rigorous isolation of all

cases of smallpox, as well as convalescents and attendants upon the sick until they are free from infection. Under the present administration of affairs smallpox patients, with the eruption still out upon them, are to be met with at public dispensaries, in doctors' offices, in stores, in public schools, in the street cars; in short, anywhere where people congregate. Even the visitors to the Smallpox Hospital go and return in the public conveyances. Not long ago a smallpox bed was deposited on a vacant lot down town, in front of a row of new and clean dwellings; no less than twenty-five cases of smallpox occurred in the local outbreak which followed. In New York a corps of physicians has been organized for systematic house to house visitation, prompt isolation of the sick, disinfection of premises and the reporting of sanitary defects in dwelling houses." These are all just accusations and crying shames. If, as the Board of Health claims, they are prevented from carrying out proper sanitary measures, by the refusal of Councils to appropriate sufficient money, the people have it in their power to force them to do so, by refusing to send to Councils any representatives until they have clearly and thor-

oughly pledged themselves to support liberally all measures looking to the public health.

Again, the Public Health Organization of Philadelphia at least, and of any other cities where it is similarly organized, is faulty. The Health Officer, whose supposed duty it is to carry out the directions of the Board of Health, is entirely independent of them, being a politician, appointed to office by the Governor. He may do what the Board tells him or he may not, as he pleases, and they can do nothing with him. A recent striking illustration of the faulty organization of our Health Department will be interesting. A prominent physician was called on a Friday evening, to a sick lady. On Sunday smallpox was developed. As the Health Office was closed, it was the obvious duty which this physician owed to society, to visit the Health Officer at his residence and report the case. Instead of doing so, he claims that he sent him an informal notice by *mail*, which could not have been delivered until Monday morning. In the absence of the physician the Health Board passed a vote of censure and fined him the paltry sum of fifty dollars. The doctor, learning of this action, asked for a hearing, which

was granted. He then, in addition to what has been already said, stated that on Sunday morning he received, by mail, a formal blank, to be filled in; he filled it in and returned it by mail, and it reached the Health Office Wednesday morning, *three days after the nature of the disease had become known to him.* The, Health Officer was asked whether he had received the communication of Sunday night, when he nonchalantly replied that he did not recollect. Whereupon the Board remitted the fine, but retained the vote of censure, and the culpable doctor departed, happy. In the meantime the patient died, and her *dead and poisonous body was allowed to remain in a room in a crowded boarding house for three days.* This in the enlightened city of Philadelphia, with a Board of Health counting several prominent physicians among its members. Such carelessness on the part of physicians and health authorities, when viewed in the light of probable evil it entails, is most censurable, if not criminal, and ought not to be tolerated. If Councils cannot be forced to appropriate enough money to prevent the ravages of a disease that we know how to control, surely there are enough rich and public-spirited citizens, who annually give

away large sums of money, who, by uniting, could give, and hardly miss, more than enough to stay the worst epidemic of smallpox.

The public duty in this matter of prevention can be summed up under three heads: Universal vaccination, complete isolation, and thorough disinfection. It will be unnecessary to discuss these points in detail, since, if the requisite amount of money is forthcoming, there are many gentlemen thoroughly conversant with the subject and amply competent to satisfactorily carry them into effect.

I have heard it said that "smallpox attacks the poorer classes, and that the rich care but little about vaccination and have but little fear of the disease." If this is so, it is a most fatal error. Smallpox makes no distinction; it would as soon enter the palace of the King as the house of the pauper. In support of the belief that the rich are careless about protecting themselves from smallpox, and to demonstrate that they are suffering from this carelessness, the conclusions derived from an elaborate statistical table which I have compiled from our Health Reports will be of value.

On one hand I have selected the three most aristo-

cratic wards of our city, into which, owing to the presumed intelligence of the inhabitants, the health authorities but rarely penetrate, leaving preventive measures, in a large degree, to the individual action of the citizens. On the other hand will be found the three plebeian wards, into which, owing to their crowded condition, and the filth, carelessness and disregard of sanitary laws of the inhabitants, the chief energies of the Health Board are expended. What do we find?

In 1861 the three aristocratic wards contributed only two and a half per cent. to the total deaths from smallpox. While during six subsequent years, during which I made my investigations, they contributed more than four per cent., a loss of over one and one-half per cent.

In 1861 the three plebeian wards contributed twenty-seven per cent. of the total deaths, while during the six subsequent years their proportion was only fourteen per cent., a clear gain of thirteen per cent., which, added to the loss in the aristocratic wards would give a comparative gain of over fourteen and one-half per cent. in favor of the plebeians.

This clearly demonstrates that it will not do to

trust to individual efforts. It shows plainly the efficacy of well-directed public efforts, and it forces us to conclude that the rich as well as the poor must be subjected to them, if we would hope to eradicate smallpox.

So much, then, for public hygiene.

2. *Private or personal hygiene.* The same cardinal points are here to be observed. Vaccination, isolation and disinfection.

Vaccination has been already sufficiently discussed. Isolation and disinfection now claim our attention. The ignorant classes must be isolated by law, since argument and persuasion have very little influence on them. There are two classes of intelligent persons to whom some advice concerning this question ought to be addressed. The first class consists of those who are keeping house, and the second of those who are boarding. When a case of smallpox occurs among the first class, if it is desired that the patient shall remain at home, the physician in charge should notify the Health Officer, who ought to send an inspector to examine into the conditions and surroundings of the patient, and to decide whether or not it would be dangerous to others to

allow the sufferer to remain where he is. If he decides in the affirmative, then all members of the family should be vaccinated and sent away, save, perhaps, one, who may insist, even after being acquainted with the peril of doing so, on remaining to nurse the sick one, as in the case of husband and wife or mother and child. The patient should be removed to an upper room, and absolutely no one should have access to him or her, save the physician and nurse. Every article that is removed from the room should be disinfected beforehand. Sheets should be hung in the door and window ways, which should be kept constantly saturated with some disinfecting solution, the nature of which I will leave to the intelligent physician, since there are so many to choose from. Thus would be reduced to the minimum the danger of any of the poisonous emanations being wafted by the wind to other portions of the house or to the outside world. It would be well to keep the air of the room constantly saturated with disinfectant vapors, which can be accomplished with the aid of a small portable steam atomizer. All clothing removed from the patient or the bed should be thoroughly washed in a disinfecting solution before being removed from the

room, while any scabs that may fall from the body should be immediately placed in the same liquid. Absolutely no intercourse should be had by the nurse with the outside world, until the physician has declared all danger of contagion to have passed.

When this period has arrived, and before any of the family are allowed to return, the sick room must be thoroughly disinfected, and for this purpose you should employ only persons who have been thoroughly protected from smallpox by a recent attack of the disease, or by a recent successful vaccination. The floor should be scrubbed, over and over again, with the strongest possible disinfectant solution. The paper should be torn from the walls, and they should be washed, as the floor, and repapered. The wood-work should all be repainted ; and in the case of very rich persons, this process should be extended to the whole house. *Every article, including even the bedstead, should be burned ;* indeed, were it possible, it would be the safest course to burn the whole house, and I am almost tempted to say, to cremate the patient himself. In this holocaust must be included all wearing apparel used by the nurse.

The second class, those who live in boarding-houses

or hotels, can be settled in a few words. They should be at once removed, either to some private house, whose inmates are willing to have them, subject to the terms and conditions already laid down for private houses, or they should be taken to the Smallpox Hospital. They have no right to remain in a house full of people who do not care for them, and to endanger the lives of their fellow-boarders. If they do not, of themselves, realize this, they must be made to do so.

They need not fear the Municipal Hospital. It should be so ruled that they would there be allowed the nurse and doctor of their own choosing, and when they once have the disease, their chances of recovery will not be lessened by removal to the Smallpox Hospital (providing they are allowed their own nurse and doctor), while the danger of infecting others will be very much reduced.

The necessity for this very great caution will be understood, when you learn that the scabs from a convalescing smallpox patient may retain their contagious or infectious powers for a long time.

Some years ago, a patient recovering from an attack of smallpox wrote a letter to a friend in a city

three hundred and fifty miles distant. When leaning over the paper, writing, a small piece of scab from his face fell, unnoticed on the paper ; the letter was folded, sealed, directed and forwarded. When received, the friend noticed this spec in one of the folds of the letter, but supposing it to be merely some dirt or imperfection in the paper, or perhaps not considering it at all, put the letter in his pocket with this scab still in it. Result: in a short time this man was taken with smallpox and died, and his death was followed by a local epidemic of the disease.

Does not this one case, which is a true one, drawn from life and not imaginative, sufficiently demonstrate the property which smallpox scabs may possess and retain for a long time, of transmitting the disease to great distances, and may it not serve to explain the sometimes apparently mysterious origin of an outbreak where no case of the disease has previously existed ?

I have now reviewed the question of vaccination as comprehensively as is possible in so small a book. The main points in each question involved have been concisely stated, the arguments for and against vaccination have been impartially and fairly stated ; and

the decision of the question has been left to the judgment of the intelligent portion of my readers.

I commenced the study of this subject as a believer in vaccination, and I have concluded it a much firmer believer than before.

I fully recognize and admit the dangers that may arise from the abuses of vaccination, but I find sufficient evidence to convince me that these abuses can be remedied.

From the evidence, I have been led to conclude that smallpox can be entirely eradicated by the universal and faithful practice of the three requirements, VACCINATION—ISOLATION—DISINFECTION.

Should my suggestions in this brochure meet with favor I will at some future time furnish conclusive and unquestioned proof that the money necessary to procure these desired conditions would be a most excellent national or state investment, since the increase in the national wealth from the number of lives saved by them would be so enormous that the expense incurred would be but as a drop in the bucket.

In the meantime, I will be very glad to hear from my readers any undoubted instances either favorable or opposed to vaccination.

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
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