REMARKS ON VACCINATION;

WITH

AN EXAMINATION

OF

SOME OF THE ARGUMENTS ADVANCED AGAINST ITS EMPLOYMENT.

BY

WILLIAM DRAPER, M.R.C.S., ETC., ETC.,

LATE SENIOR RESIDENT MEDICAL OFFICER TO THE YORK DISPENSARY, AND FORMERLY RESIDENT OBSTETRIC OFFICER TO THE MIDDLESEX HOSPITAL.

LONDON:

T. RICHARDS, 37, GREAT QUEEN STREET.

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J. SAMPSON. E. PICKERING. W. SESSIONS.

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The following remarks on vaccination were originally prepared for a private scientific society. At the suggestion of friends, they have been revised and extended with the view to publication. That they may lead to an increased belief in the advantages of vaccination is the hope of the Author.

~~25, Petergate, York,~~
Sept. 1872.

The Grey House,
St. Leonards, York

REMARKS ON VACCINATION.

Before considering the special questions discussed in the following pages, a word or two relative to the history of vaccination may not be uninteresting.

Dr. Jenner has received the credit of being the originator of the great discovery of vaccination, and far be it from me to detract one atom from his well-earned glory; for, although as a matter of historical verity, Jenner was not the first to inoculate with cow-pox, he has the incontestable merit of having successfully contended against all obstacles put in the way of vaccination, and of having communicated to his medical contemporaries the belief which he had deduced from the observation of facts.

Dr. Jenner made his first experiment in the year 1796, but the history of vaccination probably dates back as far as the year 1774. A statement in support of this may be found in the churchyard of Yetminster in Dorsetshire, where there is a tomb-stone bearing the following inscription:—

"Sacred to the memory of Benjamin Jesty, who departed this life on the 16th of April, 1816, aged 79 years. He was born at Yetminster in this county,

and was an upright, honest man, *particularly noticed for having been the first person (known) who introduced cow-pox by inoculation, and who, from his great strength of mind, made an experiment from the cow on his wife and two sons, in the year* 1774."

Therefore we see, by this inscription, that Benjamin Jesty made his first experiment just twenty-four years before Jenner communicated the result of his investigations. We are told that farmer Jesty was led to undertake the novel practice of inoculating with cow-pox to counteract small-pox during an epidemic of the disease, for the following reasons.

1. From knowing the common opinion of the county ever since he was a boy, that persons who had gone through the cow-pox naturally, *i. e.*, by taking it direct from the cow, were insusceptible of small-pox.

2. From being himself incapable of contracting small-pox, having taken cow-pox many years before.

3. From having personally known many individuals who, after having had cow-pox naturally, could not have small-pox excited; and, lastly, from believing that the cow-pox was an affection free from danger.

When the fact became known that Benjamin Jesty had vaccinated his wife and sons, his friends and neighbours, who had hitherto looked up to him with respect on account of his superior intelligence and honourable character, began to regard him as an inhuman brute for daring to practise experiments on his family, the sequel of which would be, as they thought, their me-

tamorphosis into horned beasts; consequently the worthy farmer was hooted at, reviled, and pelted whenever he attended the neighbouring markets. He remained, however, undaunted, and never failed, in spite of his persecutions, to attend to his duties, nor could he be shaken in his belief in the efficacy of his practice.

But to return to Jenner. In 1768 he, whose subsequent career proved so brilliant, was apprenticed to an apothecary at Sodbury in Gloucestershire. He was a thoughtful and observant youth. One day, happening to hear a young countrywomen say that "she could not take small-pox, for she had had cow-pox!" he was much struck with the remark, and at once made inquiries and instituted experiments on the subject. Finding that the popular notion was well-founded, he conceived the idea of transferring the cow-pox from one human being to another, and in this way he reasoned that protection from small-pox might be imparted to mankind in perpetuity. Circumstances obliged Jenner to suspend his inquiries for a while; but, in the year 1798, he announced his great scheme to the world. In the treatise which he then published, he proved that natural cow-pox casually communicated to man, produced immunity from small-pox either by inoculation or infection; that this protective power was not, in most instances, lost by time, but that it manifested itself at the end of twenty, thirty, or even fifty years, and that it was possessed by the genuine cow-pox alone, and not by other eruptions to which

the cow was subject; that cow-pox might be communicated at will to man, and that once ingrafted into the human subject it might be successively transmitted from individual to individual; moreover, that when once transmitted it conferred on each individual the same immunity from small-pox as direct vaccination from the cow.

In two years more Jenner was able to report that upwards of 6,000 persons had been inoculated with the virus of cow-pox, conveyed through a succession of human beings; and he adds, "The far greater part of them have been inoculated with small-pox, and exposed to its infection in every rational way that could be devised, *without effect*."

The protection which vaccination was capable of affording against small-pox was held by Jenner to be exactly that—neither more nor less—which an attack of small-pox, either taken naturally, or induced by completely successful inoculation, would confer against a subsequent attack of the same disease.

When Jenner first published his views concerning vaccination, they were opposed and condemned on all hands. The clergy even preached against them, and denounced the great physician from the pulpit for his supposed inhuman and barbarous practices. It was, no doubt, a rude shock to the prejudices of the people to take lymph from the body of a beast and place it in that of a man. Jenner, however, was not to be moved or intimidated, but he steadily worked on in the face

of all obstacles, and in the course of time the value of vaccination became recognised.

It need hardly be said that for vaccination to be an effectual safeguard against small-pox, it is indispensable that it be "duly and efficiently performed," for it is the regular course of the disease which so affects the constitution as to confer almost perfect immunity from small-pox, at least in a dangerous form, and not the mere performance of the operation of inserting cow-pox lymph into the human body. Neglect of this matter has led many persons to suppose that they and their children were fully protected when such was not the case, and thus sometimes caused vaccination to be improperly condemned as useless.

The protective power of vaccination against small-pox extends to every race of mankind; it is seen in every climate, and in every part of the habitable globe. Whenever small-pox has been known to occur, exemption from attack has been the *rule* among the vaccinated, the *exception* among the unvaccinated.

In consequence of this remarkable protective power, and the adoption of the practice universally by educated people, and in annually increasing proportions of the population at large, the present average death-rate from small-pox scarcely rises, in any European country, above one-tenth, and in those countries in which vaccination has been most carefully carried out it is much less than one-tenth, part of what it was at the end of last century. Mr. Simon (to whom we owe the

exhaustive report to the Board of Health on vaccination, 1857) says that since the introduction of vaccination the fatality from small-pox in Copenhagen is but an eleventh part of what it was; in Sweden, a little over a thirteenth part; in Berlin, and in considerable parts of Austria, but a twentieth; and, in Westphalia, not more than a twenty-fifth part. In the last named instance there now die of small-pox not more than *five* persons where formerly there died a *hundred.* In this country, the average small-pox death-rate for thirty years previous to the introduction of vaccination, was estimated at 3,000 per million of the population. The average for three years (1838-40), when vaccination had become to a great extent diffused, but before any public provision was made for its gratuitous performance, the rate fell to 770. The average of eleven years (1841-52), when public vaccination was gratuitously performed, but *not* rendered obligatory, was 304. The average of ten years (1854-64), during which period vaccination was to a certain extent obligatory, the death-rate was still further reduced to 171. If the compulsory clauses of the Vaccination Act of 1867 were fully carried out, there would be, there is good reason to believe, but very few deaths from the disease.

During thirty years, Mr. Marson, of the London Small-pox Hospital, has kept a most accurate and precise account of above 15,000 cases of small-pox which have, during that time, been under his personal

care. All particulars have been carefully recorded, and it has been found that, while the unvaccinated have died at the rate of 37 per cent., the vaccinated have died at the rate only of $6\frac{1}{2}$ per cent.! The recent epidemic in London was unusually severe, but a similar ratio was observed, the mortality among the vaccinated being 7 per cent.; among the unvaccinated, 42 per cent.

Mr. Marson has also observed that the degree of modifying power is in exact proportion to the excellence and completeness of the vaccination, as shown by the cicatrices or vaccine marks. Thus, the mortality amongst those said to have been vaccinated, but having *no* mark to prove it, was 23 per cent.; with one mark, 7.73 per cent.; with two marks, 4.70 per cent.; with three marks, 1.95 per cent.; with four or more marks, 0.55; or little more than one in two hundred. The average mortality amongst those with badly marked cicatrices was 8.82; and with well marked cicatrices, only 2.52. It thus appears that the average of vaccinated persons, if they should ever contract small-pox, have about one-sixth of the chance of having it fatally which is run by those who have not been vaccinated at all; some of them from bad vaccination, incur, in fact, one-third of that risk, while others, thoroughly well vaccinated, incur less than one-seventieth part of it.

During the year 1871, nearly five hundred cases of small-pox were admitted into the Cork Street Fever

Hospital in Dublin. The percentage of deaths during that period was, amongst the vaccinated, 9, whilst amongst the unvaccinated it was 75; the total percentage amongst both classes being 24.5. Of the cases of variola discreta (the least severe form of small-pox), there were *no* deaths amongst the vaccinated, whilst the percentage amongst the unvaccinated was 38.5. Of deaths from variola confluens (a more severe form of the disease), the percentage amongst the vaccinated was 48, whilst amongst the unvaccinated it was 79.5. Amongst those cases which had a purpuric complication, none had been vaccinated, and all died.

Instances are not uncommon in the experience of medical men in which two members of a family—the one vaccinated, and the other unvaccinated—have been simultaneously attacked with small-pox. In one case the disease has proved most severe, and perhaps fatal; in the other only trivial, and the patient has soon recovered. An example, well illustrating this, recently came under my own observation. Two healthy children, a boy and a girl, aged respectively six and seven years, contracted small-pox at the same time, and under exactly similar circumstances: they were placed in the same room and in the same bed, so that the general surroundings and conditions were precisely alike for each; the diet, medical treatment, nursing, etc., were also essentially the same in both cases. The little girl, who was *un*vaccinated, had a most severe attack of the disease, and died after much

suffering; the boy, on the contrary, who had been *well* vaccinated, had only a very slight attack, with not more than a dozen pocks on his body, and recovered perfectly in a week's time. The parents of these poor helpless children were avowed antivaccinists; but their own bitter experience caused them to alter their views, and they at once had the unprotected members of their family vaccinated. Is it not sad that such painful proofs as that just related should be necessary to convince people of their errors, and to induce them to abandon their unfortunate prejudices, which, alas! are but far too prevalent?

But there are other facts which relate to the comparative frequency and severity of the disease in the vaccinated and unvaccinated.

During the epidemic of small-pox in London in 1853, Drs. Seaton and Buchanan examined upwards of 5,000 children in various national and parochial schools, workhouses, etc., and found that of every 1,000 children who had *no* vaccine marks, no fewer than 360 had scars of small-pox; that of those who had only one *single bad* mark, nineteen per thousand were scarred; while of the children who had four or more perfect marks, less than one per thousand had any trace of the disease. In the well vaccinated it was quite exceptional to find anything approaching disfigurement, but in the unvaccinated a very large proportion were seriously marked and disfigured, many of them were really hideous to look at,

and in not a few cases there was permanent blindness or deafness.

Even at the present day, if any one visiting an institution for the blind takes the trouble to inquire into the causes of the affliction, he will find that, in a very large proportion of the cases, vision has been lost through small-pox; and if the investigation be carried still further, how constantly will it be found that vaccination has been neglected! Old people will tell us that, in their early years, they could not go into the street, for a few minutes even, without meeting several pock-marked persons; but now such cases are, comparatively, rarely met with, and even then seldom assume so hideous a character. Yet, strange to say, in the very face of these facts, which must be patent to all, there are not a few persons who utterly ignore vaccination. Ignorance of the facts and statistics which have been given in some measure accounts for this popular aversion; to a great extent, also, it is due to simple prejudice, and partly, I grieve to say, to the unfortunate influence of certain misguided members of the medical profession. These persons alarm the timid and ignorant by putting before them all kinds of imaginary evils as the results of vaccination; they make assertions opposed to fact, and thus they attempt to sacrifice one of the most valuable discoveries in medical science. But vaccination is an institution based on principles too sound, it is too well recognised by the country, and too valu-

able to public health, ever to be seriously damaged by such persons.

Some of the objections to vaccination, when it was first introduced, are amusing from their absurdity. One boy, with large eyes and a broad face, was said to have the visage of an ox; another boy, when fighting, was said to lower his head and run butt against his opponent like a bull; another had a patch of brown hair on his face; another was heard to make a noise like a cow; and so on. Objections such as these, foolish and void of reason or fact, dressed in a garb appropriate to the prejudices of the present day, still form the text for the wild assertions of contemporary antivaccinists.

It is a common thing to hear vaccination objected to as being *inhuman*, because the lymph comes from a lower animal, the cow. Might it not as reasonably be argued that it is inhuman to drink milk? We must bear in mind, too, that the lymph with which we now vaccinate is not usually direct from the cow, but that by successive transmissions through the human subject it becomes humanised; and even if vaccination were performed immediately from the heifer, would it not be better to induce the protective influence of a harmless and simple disease, even though it *be* obtained through a lower animal, than to run the risk of being stricken down, disfigured, blinded for life, or perhaps of being tormented, even unto death, by one of the most dreadful and loathsome of all diseases,

and especially so when the protective influence of cow-pox has been so clearly demonstrated and incontestably proved?

It is frequently said that vaccination is useless, because severe, and even fatal, cases of small-pox occur in those who have been vaccinated. The latter fact is admitted; but the inference is most certainly denied, as facts and figures, by all observers in all countries, prove the contrary. It is also stated that, though vaccination may save from small-pox, persons die of some other disease instead. Of course they do: they live to die, sooner or later, of some other disease, or of old age, but they are not rendered more *prone* to die of any particular disease; nor are they more liable to any disease than the unvaccinated. In truth, the reverse; for a serious illness, such as small-pox, may prove a predisposing cause to diseases which may end fatally. We have, again, facts to prove this. In London, the annual death-rate from all causes, at the middle of the last century, was 355 per 10,000 of the population; and from all causes, *except small-pox*, 325; but, in the middle of the present century, it was, *including small-pox*, not more than 249. In Sweden, in the period from 1755 to 1775, the general death-rate was 289 per 10,000 of the population; from 1840 to 1850 it was only 205. Similar results are obtained from the statistics of other countries. "The mortality of early life, and of all ages, save in old age, has steadily

diminished, and the number of persons who attain a good old age has regularly increased." Fevers and scrofulous diseases are said by some to have taken the place of small-pox. What are the facts? "The present death-rate of fever (including all cases formerly classed as such) amounts only to 385 per 100,000 of the population, whereas a century ago its death-rate was close on 539." Dr. Farr tells us that the combined mortality of small-pox, measles, and scarlet fever now, is only as great as the mortality formerly occasioned by small-pox alone. The mortality from scrofula, consumption, etc., has likewise been satisfactorily shown to be smaller. Whatever prevents small-pox in a population will, as before said, save many of that population from tuberculous and other diseases. The hypothesis, then, that vaccination, by rendering persons less liable to small-pox, renders them more liable to other diseases, is contrary to fact.

In the year 1856, the following questions were addressed, by the officer of the Board of Health, to a number of distinguished medical men. "Have you any reason to believe or to suspect that vaccinated persons, in being rendered less susceptible to small-pox, become more susceptible of any other infective disease, or of phthisis, or that their health is in any way disadvantageously affected?" Of 542 respondents, there was not a single one who gave the slightest support to the hypothesis.

The question of the transmission of diseases by

vaccination, apart from cow-pox, has excited much public attention of late, and much unfounded alarm respecting the matter has been occasioned. Parents are naturally unwilling to believe that there is anything constitutionally wrong in their offspring; and and when other diseases happen to follow closely after vaccination, the latter is pretty sure to get the credit of having caused them, although really and truly they are quite independent of it, and due to other conditions. Take, for instance, dentition, which process usually commences soon after vaccination has been performed. During the period of dentition, there is almost invariably more or less constitutional disturbance, frequently attended by skin eruptions and other disorders. Every medical practitioner is aware how very common it is for vaccination to be blamed for such occurrences, and equally well does he know how unjust and unfounded such blame usually is. But let us hear what some of our best authorities say on the subject.

Mr. Marson, of the London Small-pox Hospital, than whom no one has a better right to speak, in the performance of 50,000 vaccinations and more, "has never seen other diseases communicated with the vaccine disease, nor does he believe in the popular reports that they are so communicated."

Sir W. Jenner stated some years ago that, at University College Hospital, and at the Hospital for Sick Children, "he had in six years had more than 13,000

adults and children under his observation, and that, in no case, had he reason to believe, or even to suspect, that any constitutional taint had been conveyed from one person to another by vaccination."

Dr. West, one of our best authorities on diseases of children, gives similar experience. He states "that, in 26,000 infants and children under his care during a period of seventeen years, he never saw a case in which the disease could be said to be due to vaccination, nor does he believe that it excited cutaneous diseases in any but very exceptional cases, and then only when there was a disposition to them in the children themselves, this being brought out by the vaccination as it might have been by teething or any similar source of constitutional irritation."

For myself, I can safely say that I have never seen any other disease than cow-pox propagated by vaccination. Some years ago, when resident surgeon to the department for obstetrics and the special diseases of women and children at the Middlesex Hospital, I had a very extensive field for observation in constantly treating large numbers of children of ages ranging from a few weeks up to two years. It was a common thing to hear vaccination blamed by mothers for their little ones' ailments, but in no single case, after careful investigation, could I ever satisfy myself that such a cause had operated unfavourably. The charge by the parent was almost invariably grounded on the very fallacious and dangerous *post hoc, propter hoc* theory (of

which more will be said presently), that the complaint had occurred at the time of, or soon after vaccination. I am quite ready to admit that I have occasionally seen a good deal of local irritation produced by vaccination, but even when this has happened, the child vaccinated from, and other children vaccinated with the same lymph, have not suffered in the same way, so that the lymph could not fairly be blamed. I do not deny, also, that the irritation of vaccination may perhaps sometimes hasten the appearance of a complaint to which there is some latent constitutional tendency in the child operated upon, just as a cold or other accidental exciting cause might.

During a recent important assize trial, the question of the transmission or inducement of disease by vaccination was raised; the case was briefly this. A little girl five years of age was, at the request of her parents, revaccinated; within eight hours after the operation the child exhibited symptoms which (in the opinion of most of the medical men examined) were those of scarlet fever, a most unfortunate coincidence, for, in accordance with the delusive *post hoc, propter hoc* method of reasoning, it was of course argued that the vaccination had caused the affection! All the circumstances in connection with the case were most fully examined at the trial, and the evidence of some of the most eminent authorities on the subject, including that of Mr. Marson of the London Small-Pox Hospital, and Mr. Le Gros Clark of St. Thomas's Hospital, was

taken; the opinions also of Sir William Jenner, Sir William Gull, and Mr. John Simon of Her Majesty's Privy Council, and others being at hand. The statements of all these eminent men went to show most satisfactorily and undeniably that the vaccination and subsequent disease were perfectly distinct from, and unconnected with, each other. This case is by no means unique, but it serves fairly to illustrate the fact that diseases, both local and constitutional, do not unfrequently show themselves during the process of, or immediately subsequent to, vaccination. But surely, even when this accident does happen, no unbiassed observer who gives the matter proper consideration could fairly assert that the one is necessarily caused by the other. Such coincidences are much more reasonably and probably accounted for by the fact that in many diseases there is a period, in technical language called the period of incubation, during which they are latent, that is, before there is any evident manifestation of their symptoms. Now it may happen, and it occasionally does happen, that a child is vaccinated during this period of incubation of a disease, nor can any blame attach to the person who performs the operation; for, although the disease may actually be latent in the system at the time of vaccination, still there may not be the slightest sign or symptom to indicate its presence. It must be always remembered that, although vaccination is potent in preventing and modifying small-pox, it does not possess

the same influence over *all* forms of disease, therefore, after the period of incubation is over, the disease develops, and generally with neither more nor less severity than it would have done had not the vaccination been performed.

The *post hoc, propter hoc* theory, then as applied to vaccination and the causation of disease does not hold good; it is but a popular fallacy which has yet to be proved to be true. So far, I believe, that whenever the facts connected with an ailment supposed to have been the result of vaccination have been thoroughly investigated by unprejudiced persons, the verdict has been in favour of Jenner's great boon to mankind.

There are one or two points connected with vaccination, respecting which I entertain a most decided opinion, which I do not hesitate to express strongly, viz: that it is all-important carefully to investigate, as thoroughly as possible, every circumstance relative to the previous health and family history of the subject from whom vaccine lymph is taken; that it is highly essential to collect the lymph at the proper time from healthy looking vesicles; and further, that the operator be careful not to obtain any admixture of blood. These precautions being strictly observed, it is hard to believe that evil can accrue from the process.

Another objection which requires notice, is that to *compulsory* vaccination. It is obvious that for vaccination to be effectual in stamping out small-pox it must be *universal*; it cannot be universal without being

compulsory. For the good of the community *every* child must be vaccinated, not only for the sake of preventing that child from an attack of small-pox, from which *it* might possibly recover, but also, to prevent it being a source of danger to others, who might take the disease from it, and perhaps die. A father has no more right to deprive his child of the protection of vaccination than he has to deprive it of food and clothing, or of moral instruction and education. No man has a right to have his house in such a state as to become a nuisance and source of danger to his neighbours, however much that state of things may suit his own fancy.

The question of *re*-vaccination is one, respecting which much diversity of opinion exists; most of our best authorities however are, I believe, in favour of it, at stated periods, and especially on the advent of an epidemic of small-pox.

In support of re-vaccination the fact may be stated that the nurses and servants of the London Small-Pox Hospital, when they enter the service of that charity, are invariably vaccinated, which in their case is generally *re*-vaccination, and so perfect is the protection thus obtained, that although these persons live in the closest contact with, and most constant attendance on small-pox patients, the resident surgeon, during his thirty-four years of office has *never known a single instance in which the disease has been contracted.* It is a singular fact, too, that when the small-pox hospital

was built, many of the workmen were employed about the premises and wards for several months after the arrival of patients; the majority of these workmen were re-vaccinated, and not one case of small-pox occurred among them, but among the very few who objected to be re-vaccinated there were two cases!

I am of opinion that *re*-vaccination is valuable as a test for ascertaining the efficiency of the primary operation. The vaccinator usually finds that, when the vaccine cicatrices are distinctly visible, well-defined, and of sufficient number, the secondary operation, although it may take effect to some extent, will not mature, or in other words a spurious pock will be formed; on the contrary, when the cicatrices are too few in number or not well marked, probably the vaccine vesicle will run its normal course, and the ordinary constitutional symptoms of cow-pox be exhibited, proving the necessity for re-vaccination. There are, however, some conditions which interfere with the foregoing statements, such as constitutional changes, and idiosyncrasies peculiar to certain individuals.

In conclusion, I would not for one moment deny that exceptional cases of many kinds do occur; severe, and even fatal cases of small-pox happen to those who have, to all appearance, been properly vaccinated; others, who have not been vaccinated, have had the disease in a mild form, and have recovered; accidents have arisen from the careless use of lymph in too advanced a stage, and from other causes beyond control. Taking,

however, all these points into consideration, and even, did we admit that vaccination is *justly* chargeable with all the evils that have been attributed to it, there can be no doubt in any reasonable mind, that upon the whole, vaccination has been a great gain, an immense saving of human life, and a preventative of serious disfigurement, and of much misery, all over the world. What a debt of gratitude do we owe to our great fellow countryman the immortal Jenner for all this! Nor should good old farmer Jesty be forgotten. Jenner's adherents have had a hard fight, still they have stood their ground firmly; and although the struggle is not yet over, daily is it becoming less severe, daily is vaccination becoming more popular, and daily are its benefits more sought after. The success is, I believe, due to the fact that its true principles are now better understood than they formerly were, and the power which it possesses of preventing and modifying one of the most loathsome diseases to which the human body is subject, is more appreciated. It is the duty of every medical man to spread and inculcate such knowledge as far as in his power lies; with this object in view, these pages are published; should they succeed, even in a few instances, in elucidating the subject, and thus in aiding a good cause, and in advancing sound doctrines, the end for which they were written will have been gained.

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