PRACTICAL OBSERVATIONS
ON THE VACCINATION QUESTION.

By E. OKE SPOONER, Esq., M.R.C.S.,
BLANDFORD.

I HAVE read with much interest the able paper of Dr. Oke on the subject of vaccination, and the letter of Mr. Newnham, published in recent numbers of the *Provincial Medical and Surgical Journal*. It is with much pleasure that I observe these accomplished veterans, with all the energy of youth, bringing forward their matured views for the instruction and consideration of their medical brethren. They should be imitated to a greater extent by our younger members, and their example should stimulate the zeal and activity of many who are competent to enlighten us, if they would only take the trouble. Allow me, however, with all due deference, to differ in some respects from the views advocated by these gentlemen. A few years ago I should have been disposed fully to concur with them, but later and more matured experience has shaken considerably the confidence which I once entertained in vaccination. I was formerly of opinion, with the most strenuous followers of Jenner, that the occurrences of small-pox after vaccination were to be considered only as exceptional cases. That the great rule was protection, the occasional exceptions not occurring in sufficient numbers, or in sufficient severity, for us to discredit the adequacy of the great Jennerian discovery. A late epidemic of small-pox of nine months' duration in Blandford and its neighbourhood, has shown to me most decidedly the hollowness of my previous confidence, and the insecurity of those who many years ago underwent the process of vaccination. I have not the slightest reason to doubt the genuine character of the vaccine disease to which they had been subjected. Men of practical skill and sound judgment performed the operations, watched the processes, and were satisfied with the results, but in a large number of cases, an interval of twenty years having elapsed from the time of their vaccinations has sufficed to render them susceptible of small-pox when brought into close proximity with those affected by the disease. I know it has been rather too common with medical men to question the due performance of the professional duties of their brother practitioners, and that it is a very easy and ready way to say,—“Oh! this case could not have been properly vaccinated, or that case must have imperfectly developed itself.” The instances, however, are too numerous, and occur in too many cases, where the utmost possible skill, and the utmost possible watching and observation, from men of undoubted character, had been employed in the early vaccination. I have known that many of those who have been vaccinated by Jenner himself and some of his able successors, have caught the casual small-pox, and that in no mild form.

My experience has taught me that the severity of the disease very much depends upon the period of time which has elapsed since the vaccination. Very few

children recently, or within a few years, vaccinated either by myself or by others, have caught the disease, even when it has been raging in the same house. After an interval of twenty years I have witnessed very many severe and dangerous cases, of a confluent kind, leaving behind very extensive pitting and disfigurement. After thirty years I have witnessed life very narrowly saved; and the Registrar in the practice of others has had to record, in some instances, a fatal issue. I find in unison with the experiments made a few years ago in the Prussian army, that revaccination is successful in again producing cow-pox, in a large proportion of cases, when the interval from the previous vaccination has exceeded fifteen or twenty years, so that I have not the slightest doubt the same subjects would have been liable to small-pox, if closely exposed to the infection; and though in the majority of cases the vaccine vesicle is not quite so perfect in all its characters, in some instances I could discover but little, if any, difference from the first vaccination. I have examined the lymph under the microscope, and have discovered exactly similar cellular bodies, which I take to be the sporidiae of the disease. And I have tested the lymph by using it in vaccinating primary subjects, and have found it perfectly successful, and proved it to be so from subsequent vaccination from primary vesicles, as well as by the security it has afforded against small-pox.

The security for a time at least which revaccination has afforded in the same houses where the members of the family have been affected with small-pox, I have amply verified in scores of cases, and the insecurity of those who were vaccinated more than twenty years I have so frequently witnessed, that I have not the slightest doubt the results arise from some definite law, and are not by any means exceptional.

I believe I need not now-a-days enter into any argument to prove the identity of small-pox and cow-pox; the experiments of Mr. Ceely have set that question completely at rest. It is by no means the only disease which is capable of developing itself in two different genera of the animal world. Glanders, so ably elucidated by Dr. Elliotson, and hydrophobia so fatally experienced in the various mammalia, are glaring instances of the point in question. The modification of small-pox produced by passing through the cow, disarms the disease of its severity, by rendering it incapable of effluvial propagation. You must insert the germ in its proper nidus—the skin—to produce cow-pox. This constitutes at once its valuable character to the community, whilst its comparative mildness gives it its advantage to the individual.

Dr. Baron, in his interesting “Life of Jenner,” says, (Vol. 2, page 254,) “It can scarcely in my opinion be doubted, where small-pox has prevailed after cow-pox, that there has been some imperfection in the vaccine process, and that, thereby, another maxim of the author of vaccination is illustrated, which tells us that these imperfections may be propagated, and that they will afford varying degrees of protection, according as they recede from, or approach to, the perfect standard.” And he adds, sceptically:—“I am especially

struck with the force of these remarks, when I look at some of the recent accounts from Denmark. From Dr. Wendt's book it appears that revaccination is employed in the Danish army to counteract the contagion of variola. He mentions that in the year 1835, out of 3173 persons, between the ages of 20 and 25, 2175 were successfully revaccinated, while 998 resisted the infection. This is an enormous proportion, for every one of the larger number would have been liable to an attack of small-pox. I cannot avoid thinking that the first vaccinations had been imperfect.

The results of revaccination in the Prussian army have likewise led to the belief that the susceptibility to small-pox among the vaccinated is annually increasing. Thus of 100 revaccinations in 1833, thirty-one were successful; in 1834, thirty-seven; in 1835, thirty-nine; and in 1836 forty-three. How it may be in other parts of the world I cannot say: but I am constrained to repeat, that nothing has happened in this vicinity to countenance such a statement; I cannot, therefore arrive at any other conclusion than that the defect is not in vaccination itself, but in the manner of conducting the process or in the employment of imperfect virus."

I must confess that the experience I have of late years had in England corresponds very much with the Danish and Prussian experiments, though I do not partake of Dr. Baron's views respecting the cause, inasmuch as I cannot suppose the able physicians of Prussia and Denmark were incompetent to the task of securing the true vaccine process, or would have failed in detecting any abnormal development of the disease. Even if this suspicion—somewhat disparaging and ungenerous—be allowed, we have the important fact that such large proportions of the vaccinated in various countries are susceptible of small-pox, although not in its severest form. I must confess this is a great drawback on the previous confidence which the public and the profession once entertained. The question must be met fairly, and if re-vaccination be required for more complete security, the doctrine must be received by the profession, and the public mind instructed in some degree in opposition to the views of Mr. Newnham. "Since the discovery of small-pox," says Dr. Gregory, in the article on this disease in the *Cyclopædia of Medicine*, "the milder varieties of small-pox have greatly increased in frequency, so as at the present time to be familiar to every one engaged in practice." "In a certain limited number of cases, even when the proofs of correct vaccination have been most undeniable, the small-pox has been found to run its regular course, unaltered in its symptoms, and unmodified in any of its features. We cannot therefore be surprised if it has sometimes, when so occurring, proved fatal." The value of variolous inoculation, as formerly practised, in moderating the quantity of eruption and lessening the virulence of the disease, is proved by the fact that only three in a thousand cases proved fatal at the Inoculation Hospital previously to the general practice of vaccination, while three in ten died of the casual disease in the wards of the Small-pox Hospital. Now, if we combine this fact

with another, that there is no instance on record, which I have yet met with, of an individual dying of small-pox, when variolous inoculation has produced the disease after vaccination, I think we may very fairly entertain the question,—Whether or not individual life would not be secured and society greatly benefitted, if the Vaccination Act be so far modified as to allow of small-pox inoculation, after vaccination, by all legally-qualified practitioners? I would by no means pander to public prejudice, (which I must acknowledge has somewhat increased of late years,) against the practice of vaccination in consequence of the numerous failures of its protective power; neither would I for one moment depreciate the value of the splendid discovery of Jenner, which I think thus capable of still further ameliorating the condition of the human race. Vaccination, in my opinion, should be still further extended and sacredly guarded, with all the pious care which the vestal virgins took of the sacred fire of the Temple. None should be inoculated except under extraordinary and special circumstances of exposure to receiving disease in the casual and natural way; but the Legislature might fairly allow of the practice of inoculation in well-qualified hands. Allow me to explain to you the theoretical as well as practical grounds on which I base this opinion.

First of all, I would briefly notice the erroneous and crude idea of vaccination, which the homœopathic quacks of the day are in the habit of propounding, that the vaccine virus is the true prophylactic of small-pox, on the principle "*similia similibus curantur*." Now, the administration of a globule of vaccine lymph internally as a remedy in actual small-pox, is the real therapeutics of this system, but I have not yet heard of its having reached this bathos of absurdity. The cure of small-pox then, in this manner, is left to the experimental hardihood of some of those nascent geniuses, half rogue and half fool, who are now likely to abound more and more, since the lights of the fashionable world have consented to become the dupes of the system. Where flat fish are plentiful I have no doubt skilful fishermen will be found; and there are always a sufficient number of those in our profession, who fail to get employment in a legitimate way, and are willing to turn their hands to any humbug which the credulous portion of our enlightened age may choose to patronize.

"For sure the pleasure is as great
Of being cheated as to cheat."

And often, too, the profit is greater, therefore there is no lack of German diplomas among homœopathic sharpers; and as all is "fish which comes to net," there is of course a very fine catch of "eels and flounders" in the soft mediterranean of easy life and hypochondriacal fancy.

Small-pox, however, and cow-pox, have been proved by Mr. Ceeley and others, to be identical diseases, and though the *similia* part of the story vanishes before the light of science, we still sometimes hear the absurd statement that vaccination is the homœopathic remedy of small-pox.

There is a remarkable fact noticed by Simon, in his valuable work the "Chemistry of Man," one of the publications of the Sydenham Society, (of which some of us no doubt are, and all of us ought to be, members, as the books published by this society are of the highest character of standard works, and remarkably cheap and well deserving of the most extensive patronage of the profession.) Simon says (page 127, vol. I.,) "that Macgregor ascertained that the air expired by persons ill of confluent small-pox contained as much as eight per cent. of carbonic acid, and in proportion as health was restored the percentage was diminished to its natural standard. Carbonic acid is also produced during the process of fermentation." Now, I trust it may be fairly concluded, that a change takes place in the constituents of the blood during the progress of small-pox. What the exact nature of that change may be must be left for future inquirers to determine. Cow-pox appears to effect a similar change by a more gradual and less violent process. That it is less complete and less permanent in its duration than the true small-pox, appears to be indicated by the subsequent renewal of susceptibility to the contagion, which indeed we sometimes, but very rarely, notice after small-pox itself. Now this recurring susceptibility, which appears to increase with the length of the interval, may be again exhausted by a repetition of vaccination, or by inoculation with small-pox itself; and the point which we would more particularly urge on the consideration of the profession is,—whether the *post-vaccine* inoculation of small-pox would not afford us a more powerful auxiliary in treating the fever of the disease, than by leaving the community to the chance of casual infection during the progress of an epidemic.

If we examine the small-pox and the cow-pox microscopically, as I have done very carefully in every stage, we find that the essential character consists of a number of minute cells, not exceeding the 10,000th part of an inch in diameter, being about one-fourth smaller than the globules of the blood, containing within their circumference many still more minute nuclei, and presenting beyond their circumference bud-like cells of the same size and character as those contained within the circle. They exactly resemble in every thing except the size, the globules of the yeast plant, the *torula cerevisiæ*, which it is very well known is a species of living organism, requiring a certain temperature, having a definite growth, living and depending on, a particular species of food, when it has exhausted which, it ceases to multiply, but if preserved and introduced into a new nidus, containing the saccharine element on which it feeds, reproduces its kind, and continues its half-animal half-vegetable existence. The *torula cerevisiæ* contains nitrogen, and therefore may be considered somewhat allied to either kingdom. Now, if we examine more circumstantially the analogies of what I would call the *torula variolæ* with the *torula cerevisiæ*, we observe the following corresponding facts.

What do we accomplish by inoculation as it is called? Simply this. We take on the top of a lancet, or an ivory point, a few of these minute cells or germs, and

we put them into their appropriate nidus, the subcuticular tissue, where, after a few days, if they find their appropriate nutrient elements, they grow and multiply. If those nutrient elements have been exhausted by previous inoculation or vaccination, they infallibly die without reproducing their race. If the previous vaccination or inoculation has not wholly exhausted the material, or if length of time, and the growth of the body through a long series of years, has renewed the original element, they increase in a stunted or modified manner,—that is, they run through their whole course of multiplication, and decay much more rapidly,—and the process is ended many days before it would have done so in a primary affection. It is just the same with the *torula cerevisiæ*: if the whole of the saccharine matter has been changed by previous *fermentation* into alcohol, no fresh fermentation can be produced by the introduction of the yeast; but if sugar is added, the *torula* grows again with less vigorous reproductive powers; and if the proportion of spirit in the liquid be very great, it is entirely destructive to the living process. I have now under my care a woman, aged nearly seventy, who sixty years ago was inoculated successfully for small-pox, and bears the peculiar mark on her arm, and other specific marks on the body, indicative of her having passed through the disease. She is now recovering from a second attack of casual small-pox. These cases, however, are extremely rare. I have met with three only during the late epidemic.

Now, I would beg to call your particular attention, and that of the profession generally, to the double mitigation afforded by early vaccination and subsequent inoculation, and for my own part I have never observed a case in which the slightest evidence existed of the inoculated disease, in such circumstances, producing a case severe enough to spread atmospherically. It has then all the mildness of cow-pox itself, and you have the means of producing it close at hand, and in one day may secure a large population from an infliction which, if left to itself, will last for months. I am of opinion then, that by using the discovery of Jenner as the first mitigation, and the inoculated disease as the second, you may completely destroy the virulent character of small-pox, and carry out to its fullest extent those benevolent views which the immortal discoverer fondly anticipated. It is not by a blind adherence to the plans and recommendations of a great man that society and science can advance with sure and progressive steps. New experience throws fresh light upon old questions, and though inoculation has been for some time eclipsed by the noble attempts of the profession and the legislature to realize the wishes of Jenner, I think it is quite clear, that by rescuing the early and equally magnificent discovery of variolous inoculation from the shade into which it has been cast we should still more immortalize the name of Jenner himself, by removing all the suspicions and prejudices of the people against its exclusive employment, and destroy the force of that feeling which has been provoked against it by its numerous palpable and indubitable failures to produce a permanent security against an attack of natural small-pox. The

plan I would propose then, would be, that every child within a twelvemonth of its birth shall be required, under a certain penalty, to produce evidence of its having undergone the process of vaccination. That no child shall be received into any public or private school without such a testimonial or mark, and that subsequent inoculation by a qualified practitioner shall be allowed by the law whenever small-pox is threatened, of the proximity of which due notice shall be given to Boards of Guardians by District Registrars or other proper authorities. That the penalty against unqualified persons inoculating shall continue as it at present stands.

If we take the case of an emigrant ship, with six or seven hundred passengers of all ages on board, of whom some fifty or sixty may have had the small-pox, while the remainder have been vaccinated only, we may suppose, as has frequently occurred, that the small-pox breaks out when about ten days' sail from the port. Now, by inoculating all who have not passed through the disease, every life may be preserved, and a disease, so mild in its character, passed through without leaving a single injury behind; so that in one fortnight every vestige of small-pox may be banished entirely. If the disease is suffered to take its natural course, a few will die who take the disease severely, many will be suffering from intense fever and foul effusion, with considerable danger, trouble, and anxiety, even when the cases terminate in eventual recovery. It was only a short time ago that a transport ship lost eighty of its men, and was refused pratique at Malta in consequence of a very similar occurrence. Now, all this might have been prevented by the simple process of immediate inoculation. Is it fair to tie up the hand of the surgeon by forbidding him to inoculate? Is it just that the law should interpose with its veto and deprive the crew of the certain means of safety, and leave them for weeks together anticipating a daily accession of fresh cases? It has been objected to inoculation that you hereby spread the disease, but this argument falls to the ground when a ship's crew are threatened far away from land. Now, let us examine for a few moments the very mild character of the inoculated small-pox after vaccination. Never has a fatal case occurred to me, even when no previous vaccination had been effected; very few pustules are even then produced, but in cases where the cow-pox has been previously received, the disease is by the double process so effectually mitigated, that I very much question whether sufficient effluvia or exuviae are produced to give the natural disease to another. Now, the case of the ship may be transferred to the household, and the same line of argument may be adopted to prove the propriety of allowing inoculation at the discretion of the medical practitioner, when the parties have been previously protected by vaccination. The Vaccination Act has now been ten years in operation; for my own part I have seen more of small-pox than in the ten years previous, and I believe my experience corresponds with that of the profession generally. It is vain to hope that the small-pox can be extinguished by the rendering inoculation illegal, it spreads to a more dangerous extent by leaving it to take its own course,

and a town or village, of moderate size, instead of getting rid of the disease in a few weeks, as it might do by immediate inoculation of the vaccinated, retains the frightful malady for months, and leaves hundreds of its marked victims, even where it does not appear in the mortality returns of the Registrar-General. I am quite sure the poor generally will be willing to pay for their own inoculation, if the State pays for the primary vaccination, and those who prefer re-vaccination or are willing to trust to the preservative effects of a primary vaccination, may be left to follow their own course. The liberty of the subject will be by this plan perfectly preserved, and the security of the population against a heavy calamity within the reach of legal investigation.

Dr. Wilson, in his excellent and standard lectures "On the Practice of Physic," states, that during an epidemic of small-pox in Scotland, Dr. John Thomson saw from June, 1818, to December, 1819, 556 cases. Of these, 205 had previously neither small-pox nor cow-pox, and 50 of them died, or 1 in 4. Forty-one took the small pox for the second time, and Dr. Thomson knew of 30 other such cases of which 3 died, or 1 in 23. Three hundred and ten had been previously vaccinated, and among them there was but one death.

The town of Marseilles, in 1838, at the time of an epidemic of small-pox, had 40,000 inhabitants; 30,000 of these had been vaccinated, 2000 had had small-pox, 8000 were unprotected. Among the 30,000 vaccinated, about 2000 were attacked with small-pox, and 20 perished, 1 in 100. Of the 8000 vaccinated 4000 were attacked, and 1000 died, or 1 in 4; and out of 200 variolated, 20 took the disease a second time, and 4 died, or 1 in 5.

Dr. Farr states in the "Medical Annual," that at the age of 15, 19 per cent. die; between 15 and 20, 24 per cent.; between 20 and 30, 34 per cent.; between 30 and 40, 46 per cent.; between 40 and 50, 58 per cent.; 50 and upwards, 79 per cent.

Now, if these persons had undergone previous vaccine protection, the length of the interval would be the rate for estimating the severity of the disease.

Baron Dimsdale, a great inoculator of the last century, states, not one in 1500 died of the inoculated disease. The two Brothers Sutton declare not one in 20,000. Dr. Gregory, at the Small-pox Hospital, where the chances of effluvial contemporaneous infections are greater and most probably reach the average, shews that about one death in 500 takes place after inoculation.*

Now, taking these averages for the mortality of unprotected inoculation, what can we say the average of the mortality would be, if all were previously vaccinated. The deaths would be reduced to a mere fraction, and this I contend would be the case if the test of inoculation, which I would thus fairly expose to the consideration of the profession, were fairly adopted.

There are many objections to frequent repetitions of vaccination, although of course to all who are willing to undergo it, it may be and should be afforded. My remarks on this point I will reserve for a future paper.