

mucous or serous. In fact, the functions of every organ are sustained by a due balance between the processes of secretion and absorption in unintermitting activity. Hence the constitutional pyrexia in vaccination commences with the formation of the vesicle; and hence, too, the number of vesicles is a measure of the immunity conferred. This argument holds good, I think, in small-pox and other similar affections, as well as cow-pock." Mr. Ross then recited the particulars of several cases illustrating his views, and continued: "I need not quote a large number of cases, as they resemble each other very closely. A table accompanying this paper exhibits at one view all the facts I have been able to collect. It will be observed, in reference to the table, that the frequency of the secondary disease depends upon the time of year when vaccination is performed. During the summer, when the circulation is hastened, and the functions of the skin are actively performed, the consecutive eruption appears more frequently than in winter, when it is very rare. The winter is generally admitted to be an unfavourable time for vaccinating, as the coldness of the temperature depresses the vital powers, and tends to prevent, especially among the poor, the proper development of the poek. In consequence of the greater prevalence of the secondary eruption in summer, and the suspicion with which it is viewed by parents, I have been accustomed to postpone vaccination as much as possible during the high temperature of June, July, and August; and I think it would be better if this caution were generally observed, especially with private patients, for nothing can be more disagreeable to a surgeon than to find his little patients covered with an eruption which he did not anticipate. It is fortunate that the eruption rarely continues more than three or four days, and is frequently more evanescent, a circumstance which distinguishes it from the ordinary eczematous diseases. I may observe here, that no experience on this matter can be worth much that is limited to an observation of the poek on the eighth day, as is the ordinary practice in public institutions. Hence I do not regard as of any weight the objections of those gentlemen who, with such an experience, have denied the existence of a special secondary eruption. Being public vaccinator for an extensive district, I vaccinate a considerable number of children every week, at the present time, yet from never watching the cases after the eighth day, I rarely hear of instances of secondary eruption; but I have not the slightest doubt that I should discover them, as frequently as heretofore, if I followed the cases up as I did when I was conducting these investigations. I think that I have now adduced evidence sufficient, if not to convince absolutely, at least to induce a strong presumption in the mind of an unbiassed man, that vaccinia, under certain circumstances, is followed by a secondary eruption, special in its nature, though various in forms, which observes fixed periods of evolution, and is an integral part of the original affection."

A discussion of some length took place, in which several fellows of the Society joined. The chief point discussed referred to the question whether the secondary eruption was the direct result of the vaccination, or merely the consequence of the irritation produced in the system by the introduction of a foreign matter. It was generally considered that the secondary eruption was the result of simple irritation produced in the system by the vaccine virus, and that any other source of irritation might have been followed by the same results; that, in fact, the eruption was due to the development of some latent disposition in the system to the eruptive disease which manifested itself. None of the speakers had been enabled from observation to connect the eruption with any periodicity in its appearance.

Mr. Ross, in reply, stated that the whole gist of his paper depended on this periodicity, of which he was certain, and without which his paper advanced nothing new. He thought the subject open to investigation, and upon that point was worthy of the serious consideration of the Society.—*Lancet*, Feb. 14, 1857.

21. *Inoculation of Man with the Matter of "Grease."*—On the 29th of April, in the present year, a communication was addressed to the Academy of Medicine, at Paris, by M. MANOURY, surgeon to the Hôtel Dieu, at Chartres, and M. PICHOT,

a physician at La Loupe, concerning a man who had been accidentally inoculated with matter proceeding from a horse affected with grease; and at the same time some of the matter obtained from the man was forwarded to M. Bousquet for experimental purposes. The account of the case is this: On Tuesday, the 5th of March, a farrier, named Brissot, aged 28, called upon Dr. Pichot in consequence of a painful affection of his hands, and, on examination, these organs were found to be considerably swollen, and covered with *opaline and umbilicated pustules, which were confluent, and in every respect similar to vaccine pustules of the eighth or ninth day*. He had never been vaccinated, and he had not been near any cow, but he remembered to have shod a short time previously a horse affected with grease. This happened on the 11th of February. There are twenty-four days from the 11th of February to the 5th of March, but as at this latter date the pustules presented the appearance of vaccine pustules of the eighth or ninth day, it is necessary to conclude that the period of incubation had been fifteen days. The horse was seen by M. Boussergent, a pupil of the veterinary schools of Toulouse and Alfort, and found to be suffering from a true attack of grease.

Dr. Pichot obtained some matter from the back of the hands of the patient by puncturing the pustules with a lancet, and having placed it upon glass, some was sent to M. Manoury, at Chartres, and some to M. Bousquet. With the matter sent to him, M. Manoury made a series of very exact experiments upon children, and in every case (the number is not given) the inoculation resulted in a well-defined pustule, of the size of a large lentil, umbilicated, surrounded with an areola, and not to be distinguished from a vaccine pustule. He also obtained similar pustules by inoculating other children with the matter obtained from these pustules. Some of this secondary matter was also sent by M. Manoury to M. Bousquet, and this gentleman inoculated a child at one and the same time with it and with the matter obtained directly from Brissot, and sent to him by Dr. Pichot. The right arm was inoculated with the one kind of matter, and the left arm with the other kind. The result was remarkable. The inoculation made with the matter obtained from the farrier failed altogether, producing neither congestion nor irritation; but in the inoculation made with the matter obtained secondarily from the child, the operation was perfectly successful, and every puncture was followed by a pustule which differed in no respect, either in its history or its appearance, from the common cowpox.

These facts speak for themselves. There is developed in the hands of this farrier a malady which has all the properties as well as all the appearances of cowpox, and the only question is as to how this malady originated. The man declares that he had not been near any cow, and he remembers to have shod a horse affected with grease, fifteen days before the skin became affected—a horse which, when examined by a veterinarian, was found to be suffering in the foot and lower part of the leg from that cutaneous malady which is characterized by a discharge, at first serous and limpid, then yellowish, acrid, and fetid, with a reddish swelling of the skin and subcutaneous tissue, which the French call *défluxions, eaux-puantes, eaux aux jambes*, and which we call grease. Is there, then, that intimate relation between cowpox and grease which appeared to be so probable to the illustrious discoverer of vaccination, and to some of his contemporaries, and which has since this time been almost or altogether overlooked? Jenner wrote, in 1798, that cowpox was given to cows by farm servants, from horses suffering from grease; and he succeeded in producing cowpox in a cow, and the vaccine pustule in a man, by inoculating them respectively with matter obtained from a horse thus affected. These experiments were repeated at the time, sometimes with success and sometimes without; and the cause of the uncertainty was not known until the subject was investigated by Mr. Loy, a surgeon living at Pickering, in Yorkshire. These investigations, which are models of scientific induction and deduction, were made in 1801. In the beginning of the year this gentleman was consulted by a farrier, whose hands were covered with an eruption, consisting of pustules, separated from each other, and surrounded by an inflammatory circle. These vesicles resembled those proceeding from a burn, only they were regularly rounded, and their centre exhibited a black spot which seemed to have been caused by some slight

injury. This man had been engaged in dressing a horse suffering from grease. He had never suffered in the same way before, but he had had the smallpox. About the same period, a butcher, living at Middleton, a place near Pickering, was attacked by painful ulcers on both hands, and especially about the roots of the nails. These ulcers became inflamed in the course of a few days, and a vesicle formed upon each of them. The lymphatics of the arms also became red and painful, and a tumour formed in one of the armpits. There was also a pustule on one of the eyebrows, similar to the pustules upon the hands, which had to all appearance been communicated by touching or rubbing the part. In this case there was considerable fever. This patient, like the last, had been occupied in attending upon a horse suffering from grease, and was so occupied at the time he fell ill. He had not had smallpox.

In order to ascertain whether this malady was communicable by inoculation. Mr. Loy inserted some of the matter contained in the pustules into the arm of a brother of the man, who had never had smallpox. On the third day a vesicle had formed. Then there were some feverish symptoms. In the end the vesicle exhibited all the character of true cowpox.

Contemporaneously with this experiment, some of the same matter was inserted, by means of a new lancet, into the teat of a cow. Nine days afterwards there was a vesicle, surrounded by a red areola. The teat also was hard to some distance from the puncture, and so painful that the animal would not allow it to be touched. A few days later a crust had formed upon the vesicle, and the inflammation had subsided.

An infant was inoculated with matter taken from the pustule which had formed upon the teat of this cow, on the ninth day from its commencement, and the progress of the inoculation was watched with great attention, when it was found that the inflammation, the vesicles, and the formation of the crust were not to be distinguished from the corresponding phenomena in ordinary vaccination. On the sixth day this infant was inoculated with the smallpox, and the puncture seemed to inflame until the third day; but this disturbance passed off without any further development, and the child escaped the disease.

Another infant was inoculated with matter taken from the butcher. On the third day there was a pimple on the part punctured; on the sixth day this was surrounded with a pale inflammatory circle, and the borders were more elevated than the centre; on the eighth day there was a vesicle containing a limpid fluid; on the fourteenth this vesicle had changed into a brown and hard crust. Shortly afterwards this child was inoculated with the smallpox, without any result.

In addition to these experiments, Mr. Loy inoculated the nipple of a cow with a very limpid matter, taken by a perfectly clean lancet, from the heel of a horse suffering from grease. On the fifth day the part punctured was elevated and surrounded with a pale redness. A few days afterwards a purple vesicle, containing a limpid fluid, had become formed, and the part was swollen and painful, but the general health of the animal did not appear to be affected.

Mr. Loy then inserted matter, which he had taken from the pustule of this cow, into the arm of an infant. On the sixth day afterwards there was considerable redness, and on the ninth a vesicle. Then this infant was inoculated in three different places with smallpox, and absolutely without result, either local or general.

Another infant was inoculated with matter taken from the heel of the horse which had been the occasion of the mischief. Three days afterwards there was a pustule, surrounded with a small degree of inflammation; on the day following this pustule was more elevated; on the fifth day it had changed into a vesicle of a purple colour; on the sixth and seventh days this vesicle had become larger and darker. These changes were accompanied by a considerable degree of fever, the onset of which was marked by shivering and vomiting. The variolous inoculation was tried in this case, also, but no impression was made by it.

Three other children were inoculated with matter obtained from this last-mentioned child on the sixth day after its inoculation; and on the tenth day they presented vesicles surrounded with some degree of erysipelatous redness.

These vesicles at this time were beginning to dry, but they still contained a considerable quantity of limpid matter. The children were then inoculated with the matter of smallpox, and the only effect of this operation was to produce a slight degree of local inflammation, which disappeared on the fifth day.

It was only after several unsuccessful attempts that Mr. Loy was able to satisfy himself that the matter of grease would act upon the cow without having first passed through a metamorphosis in the human body. At last, however, he found that the inoculation was abortive unless the matter was taken from a horse in which the symptoms of grease were general as well as local, beginning with fever and ending with an eruption, not only in the heels, but upon other parts of the skin, the fever subsiding when the eruption made its appearance.

These observations of Mr. Loy are also confirmed in every respect by the observations of Signor Sacco, whose *Trattato de Vaccinazione con osserv. sul Giavardo et Vajuolo Pecorine* were published in Milan in 1800.

M. Sacco says that his first attempts at inoculation with the matter of grease were very unsuccessful. Before reading Mr. Loy's treatise, he had operated unsuccessfully upon twenty-seven cows and eighteen children; and, before he succeeded, he was still doomed to failure in several instances. At length his own horse was attacked with grease, and he repeated his experiment with the clear viscid and fetid serosity which escaped from a crack in the heel on the fourth day from the commencement of the symptoms. These experiments, which were made upon two children and one cow, failed as completely as the others. *But his groom, who had to dress the heels of his horse, was affected with five pustules*, three on the right hand and two on the left forearm, which pustules were precisely like those of the cowpox. This man had not been inoculated. Unfortunately, however, these pustules were too much dried up to be serviceable for any experiment when they were first seen by M. Sacco. About the same time, the coachman of a gentleman called Clari, who had also had to dress a horse suffering from grease, and who had not had smallpox, had both his hands covered with a vesicular eruption, accompanied with fever and diarrhoea. These vesicles were perfectly similar to the vesicles of smallpox, and several children who were inoculated with matter obtained from them by a colleague of M. Sacco, M. Birago, went through the regular stages of the vaccine complaint. In addition to this, the same coachman was taken, on the same day on which M. Birago made his experiments, to the Foundling Hospital at Lembrete, and then M. Sacco inoculated nine children and one cow with matter obtained from him; the result being, that the operation failed upon the cow and upon seven of the children, and succeeded upon the remaining two children. In these two children the complaint produced was absolutely undistinguishable from common cowpox, and the matter obtained from these children has been subsequently used in a long series of vaccination.

Nor is this the only evidence connected with this subject. On the contrary, Jenner himself wrote, in January, 1801, of a farm-servant on a neighbouring estate near Berkeley, who was affected on one of his hands, after tending upon a horse affected with grease, with pustules which were not to be distinguished from those of cowpox, and upon whom the inoculation with the matter of smallpox failed some three months afterwards. And in February, of the following year, Jenner writes of having seen, in the preceding summer, a pustule resembling cowpox upon the hand of another farm-servant, who had been employed in dressing a diseased horse. He says, moreover, that he made several attempts to vaccinate with matter procured from this pustule, but without producing any other effect than a slight and transitory redness. This failure, however, did not at all shake Jenner's confidence as to the relationship existing between grease and smallpox; and as explaining the failure by showing that the causes of success depend upon very subtle conditions, he remarks further that he had always failed to carry cowpox by a lancet from one cow to the teat of another. He also says that oxen and bulls are never affected with cowpox (this might be expected), and that vaccination succeeds readily upon calves of either sex.

Such, then, is the evidence upon which the analogy between grease and cowpox must be made to rest, and hence the case of Brissot must be regarded as a

very important contribution to the history of philosophical medicine.—*Ranking's Abstract*, vol. xxiv., from *Gaz. Méd. de Paris*, May 31, June 7, 14, and 21, 1856.

22. *Treatment of Asphyxia*.—M. FAURE terminates a long series of papers by the following conclusions: 1. Asphyxia, whatever may be its cause or its form, is identical. If the symptoms dependent upon the manner in which it is produced, or upon the secondary lesions it has given rise to, vary, its own characters, viz., those which are due to the general alterations consecutive to the changes in the blood produced by a defective hæmatisis, are absolutely invariable. 2. It is the most exact representation of the condition termed hyposthesia. From the beginning to the end, it is but a gradual enfeeblement of the vital powers. The intellectual faculties first succumb, then the locomotive powers, next the organic functions, and, finally, the proper properties of the tissues. 3. Of all the faculties, that which is easiest followed during the different phases of its disappearance is the sensibility. Abolished at first at the extremities of the limbs, it goes on gradually diminishing, until it exists only in a very limited portion of the body, the pupil. Not only does it thus progressively disappear from the surface of the body, but there is also observed a determinate gradation in the decrease of the different degrees of its power. At first, mechanical stimuli are found to have lost their power over it, then cold, and, lastly, the actual cautery. When this last is applied to the upper part of the chest without producing any effect, death has certainly taken place. 4. When the asphyxiated person is restored to life, we find him recovering his lost properties, functions, and faculties, one by one, in the inverse order to that in which he had lost them. Locomotive power is never re-established till a late period, and the intellectual and moral faculties later still. Sensibility is especially recovered at the point it was last limited to, and then gradually extends over a larger surface. 5. The fundamental fact in asphyxia is the abolition of general excitability, and the reproduction of this is the sign of the return of life. 6. In our treatment we must exclude everything that can diminish the powers of the organism. We must not mistake for the effects of organic changes the perturbations that may be observed, as a tendency to coma, convulsions, etc. These being merely functional, dependent upon the condition of asphyxia, disappear with it without the aid of any special treatment. Especially must bleeding be abstained from, except in regard to true inflammatory accidents that may be ulteriorly developed. 7. The only suitable treatment consists in the employment of stimuli. These lose or gain in power according to their mode of application. Applied from below upwards, that is, in the direction of the paralysis, however powerful they may be, they will prove of no avail; while even very simple ones, employed in a contrary direction, are of great efficacy. A drowned person had resisted for eight hours the most energetic stimuli applied to all parts of his body, when Cagé restored life by gently tickling the fauces with a feather. 8. Slight stimuli may suffice in the most serious cases, when the asphyxia has not lasted long; but this is not so when the state of apparent death has long continued; for then the asphyxia has produced disorders which, added to the primary cause, render the restoration of life more difficult. In such cases, we must act with perseverance and energy, in order not only to obtain the first signs of returning life, but also to resist the tendency to relapse into a state of somnolence, and to definitively expire as soon as the attempts at revival are discontinued. 9. The first resistance should be overcome by means of cold affusions or cauterizations, and sometimes by the simultaneous employment of these. The affusions should be extended over the entire surface, being especially directed towards the head, and projected with force, at short intervals. For cauterization, the nearest object capable of bearing a great heat will suffice, as a piece of iron, or charcoal, a heated pipe, etc. In order to judge of the condition of the patient, we may first try the application to the lower extremities; but we must never expect to reanimate him, except by applications made from above downwards, commencing at the point where sensibility still exists. The heated body must be gently applied, the applications being multiplied, each not occupying more than three millimetres in extent, and not penetrating beneath the epidermis. As soon as some signs