Observations on variola vaccina, or cow-pock / by Sir Matthew John Tierney ... ; including a statement of the formation of the first county vaccine institution established in Sussex in 1804.

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Tierney, Sir M. J.

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OBSERVATIONS

ON

VARIOLA VACCINA,

OR

COW-POCK.

BY

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F.R.S. LIT., &c., &c:

INCLUDING A STATEMENT OF THE FORMATION OF THE FIRST COUNTY VACCINE INSTITUTION ESTABLISHED IN SUSSEX IN 1804.

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OBSERVATIONS ON VARIOLA VACCINA, OR COW-POCK.

The increased mortality by small pox, and the doubts expressed as to the efficacy of cow-pock, in protecting the human frame against that loathsome disease, induce me to call the attention of the medical profession, and the public at large, to this important subject. To justify me in doing so, I think it right to state the experience I have early had in cow-pock.

In the year 1798, soon after the late Dr. Jenner's valuable Treatise on Cow-Pock, I had an opportunity, on a large scale, of testing the accuracy of his statements.

The supplementary Militia being called out,

the South Glo'ster regiment was stationed, in part, at Littlehampton, in the County of Sussex ; to this I was attached. By the army regulations of the day, all recruits, not having had the small pox, were directed to be inoculated. In obedience to this order, these recruits were removed to what was then called a "Pest House" in the district of Arundel, used at all times for the reception of persons to be inoculated for small pox. During this process several of the recruits, although repeatedly inoculated, and constantly residing among the others in various stages of the disease, resisted the infection. On inquiry it was found that these men in attendance, and milking cows in Gloucestershire, had been infected by a disease familiarly known as cow-pock, and which was considered a perfect protection against small pox.

In the autumn of this year the regiment moved to the barracks at Horsham, where the small pox prevailed to an alarming extent in the South Middlesex Militia. The recruits which resisted the small pox in the "Pest

House," were placed in attendance on small pox patients. Having such experience and confidence in the preventative power of cow-pock, several of the Middlesex regiment were submitted to vaccination; after which they continued to resist small pox, although in constant communication with their fellows in and out of the hospital, and in various stages of that disease.

In the winter of 1799, I became a student in Edinburgh, and in the spring of 1800, the late Dr. Gregory, Professor of Medicine in that University, delivered in one of his chemical lectures, a severe and unqualified opinion against cow-pock. On the following day I had a full communication with this excellent and liberal minded gentleman, detailing to him my experience in cow-pock. He expressed himself so satisfied with my statement, that he requested me to vaccinate his then only son. For this purpose, having the vaccine virus from Dr. Jenner, I performed the operation. Dr. Gregory after this became a warm advocate for

cow-pock. It is due to this great man to state, that matter sent from the Small Pox Hospital in London, by some mismanagement produced small pox, and thus brought some discredit on Dr. Jenner's invaluable discovery. In the spring of 1802, during my residence at Glasgow, (where I graduated) I vaccinated the son of Dr. Jeffery, (one of the Professors of that University) thus the cow-pock was established in Glasgow and Edinburgh.

In May of this year I became a resident at Brighton. In 1803, the war being renewed, the Sussex Militia were called out and quartered at Brighton. In the early part of 1804, Lord Pelham, (the late Lord Chichester) commanding this regiment, requested me to visit some of the men, suffering from a complaint which had proved fatal in many instances. Being familiar with this disease, in which I had previously considerable experience, the measures adopted, arrested the progress of the complaint.*

* At some future time I hope to give a detailed account of this disease.

The small pox, accidentally introduced into Brighton in February of that year, proved fatal to several persons, and among these to some of the Sussex Militia. On this I stated to Lord Pelham my experience in cow-pock; and by his Lordship's desire, the men of the Sussex Militia, who had not had the small pox, were vaccinated, its success being complete. It appeared in the course of enquiry that the prejudice against vaccine inoculation was so great among the lower classes of the people, that many of the soldiers, when examined by the surgeon upon joining the regiment, had falsely stated that they had had the small pox or cow-pock; the consequence was that many caught the small pox, and it was not until several had fallen victims, that the rest could be persuaded to acknowledge that they had not had either of these diseases, and then submitted to vaccination. It also appeared in the course of enquiry, that, upon a false notion that the inoculation was easy, and required no particular medical attention, many had been inoculated (as they

supposed with cow-pock) by the blacksmith or shoemaker of the village, but had no certain knowledge that they had been infected.

Lord Pelham, with a laudable anxiety to extend the advantage of cow-pock, requested me to put on paper a plan to be submitted to the County. This plan was laid before the Deputy Lieutenants, at Lewes, and afterwards before the Grand Jury at Horsham, who expressed their confidence in cow-pock, and the advantage of an Institution for the County, to co-operate with the Royal Jennerian Society of London. His Royal Highness the Prince of Wales was applied to, and was pleased to become the patron of the proposed society; and thus in Sussex was established the *first* County Vaccine Institution, the medical gentlemen zealously and liberally supporting and forwarding its objects in the county.

The Medical Board of this Institution (of which I had the honour of being president and Dr. Blair vice-president) framed rules and regulations for its conduct, with instructions for

vaccine inoculation, and issued an address which I consider applicable at the present time, and therefore republish it as in the following pages.

Note.—Although perhaps irregular, I am induced by the importance of the subject, to call attention to the following:—

Heat is a powerful agent in decomposing the Vaccine Virus, as appears from the following facts:

"In the autumn of 1801, visiting a friend of mine in Cheshire, on whose estate, as well as neighbourhood, the small pox prevailed, I procured some Vaccine Virus from Dr. Jenner, transmitted between two small squares of glass; intending to use it the next day, I kept it in my pocket, there being also a large fire in the dining room; with this I inoculated several children. In three or four days considerable inflammation appeared on the arms, followed quickly by ulceration, in some, troublesome, in place of the usual progress of the proper Vaccine pustule. I mentioned to the parties the irregularity, and that I could not consider their children secure from small pox, and some being exposed to the disease, caught it. This may possibly account for occasional failure in vaccination in India and other hot climates.

In a few days having stated these facts to Dr. Jenner, I received from him a fresh supply, with which I vaccinated some of the previous patients and others in the neighbourhood, with complete success. It is scarcely necessary to add, that this supply of Virus was not exposed to heat, and the parties thus vaccinated were constantly exposed to the small pox with impunity."

M. J. T.

ADDRESS TO THE PUBLIC,

1804.

THE subject on which we at present address the public, is not only interesting to this county, but to society in general; and when it is considered that the object is no less than the preservation of the lives of many of our fellow creatures, we cannot but look forward with confidence to the co-operation of our countrymen. When the duty of arranging a plan and regulations for this institution was imposed on us, in a manner gratifying to our feelings, by a committee of the subscribers, we considered it necessary concisely to state to the public the views of the institution; and although so much has already been published on Cow-Pock, it may not be superfluous to add the following observations on its efficacy:

It is universally admitted that Small-pox has been for twelve centuries the scourge of Europe, and that one-twelfth of its population has been destroyed by this single disease: that 3,000 persons in London, and 40,000 in the United Kingdom have annually fallen victims to it; and it is scarcely necessary to observe, that many of those who have escaped with life have been mutilated or disfigured.* With such evidence of the effects of this formidable disease, highly gratifying must it be to the philanthropist to perceive within his reach the means of eradicating this 'plague' from the catalogue of human ills.

In Gloucestershire, certain pustules on the teats of cows, affecting the hands of the milkers, have long been considered in that county as a sufficient protection against the attacks of

* Although parochial evidence may be deemed unnecessary to assist in establishing so acknowledged a truth, it may not be amiss to adduce the testimony of the parish register of Slaugham, in this county, by the Rev. Mr. Ellison, by which it appears, that one-twelfth of the deaths in that parish for the last 50 years, has been occasioned by small pox.

small pox. Hence arises the appellation of cow-pock.

To the observations of Dr. Jenner, and a well-conducted series of experiments which he liberally communicated to the public in 1798, we are indebted for this valuable discovery, and its more general utility. It has now received confirmation from every quarter of the globe; and this nation has in particular sanctioned it by the parliament, having bestowed a reward on the discoverer. Some millions have already been vaccinated, and when failures have been observed, they are clearly proved to have occurred only when the disease was not genuine.

It is however proper to observe that the cow-pock being characterised by a single pustule, and from its effects not deserving the name of disease, its very simplicity has occasioned several mistakes, even in the hands of intelligent surgeons; and it is now admitted that experience is as necessary in this, as in any other part of medical or surgical science. The object

of this institution, is therefore to confine the practice to medical gentlemen, many of whom have benevolently proposed to give their labour during stated times, gratuitously, to vaccinate such poor persons as are proper objects; to keep regular registers of such vaccination; to shew at one view the progress of the institution; to have different stations in the county, by which genuine matter may at all times be distributed, and the greatest source of error be avoided; and lastly, by the union of all ranks of society in the cause, by an early and general adoption of Vaccine Inoculation, eventually to fulfil the benevolent views of the subscribers, by the extermination of small pox.

That the different objects of the institution will be accomplished there is every reason to expect, from the patronage under which it is introduced to the public, and the highly respectable persons who have given it their support. The advantages attendant on the cow-pock, must also powerfully recommend it, when it is considered that it requires neither

confinement nor medicine; that it cannot be propagated by effluvia; does not endanger life or limb; that all ages may with equal safety and advantage submit to the inoculation; and that, when truly produced, it protects the individual during life from small pox.

Surely no further recommendation is necessary!

It has been considered necessary to publish, with slight variations, some parts of the address of the Royal Jennerian Institution in London, such as Instructions for Inoculation, &c.; a Comparative Statement, &c.; and an Address from a Clergyman, &c.

INSTRUCTIONS

FOR

VACCINE INOCULATION.

AN ACCURATE KNOWLEDGE OF THE SIGNS OF INFECTION, AND OF THE CHARACTER AND PROGRESS OF THE VACCINE VESICLE, IS ESSENTIAL TO THE SUCCESS OF THIS INOCULATION.

The Signs of Infection, and Description of the Vaccine Vesicle.

When Vaccine Inoculation proves successful, a small red spot, with a degree of elevation which may be felt, commonly commences on the third day. When examined with a magnifying glass, it seems to consist of a small tumour, surrounded by a slight efflorescence.

Between the third and sixth day, a Vesicle appears, the shape and magnitude of which depend much on the mode in which the in-

oculation has been performed: when it is performed by a slight puncture, the Vesicle will be small and circular.

The edge of the Vaccine Vesicle is elevated and well defined; the centre is depressed, and a speck is there visible, of a darker colour than the rest of the surface. This Vesicle is distinguished from other Vesicles by the peculiarity of its structure, which is cellular, and somewhat hard and firm. At first it is of a light pink colour, sometimes blended with a bluish tint, gradually changing in its progress into a pearl colour. Its contents are limpid, and almost colourless. It commonly increases in size till about the tenth day.

In its early stages it has usually a small inflamed ring round its base, which about the ninth day begins to spread rapidly; and about the tenth forms an areola, more or less circular, an inch and a half or more in diameter. This areola is of a pink, scarlet, or crimson hue; and is attended with some degree of hardness and tumefaction. It con-

tinues nearly stationary a day or two, and then begins to fade; sometimes forming on its decline, two or three concentric circles.

When the areola is perfectly formed, the Vesicle begins to decline; first it turns brown in the centre; then it is gradually converted into a hard, smooth shining scab, of a dark mahogany brown colour, approaching to black; and, its general appearance, has not unaptly been compared to the section of a tamarind stone. This scab commonly falls off about the end of the third week; and leaves a circumscribed cicatrix, clearly denoting that the true skin has been affected.

In the computation of time, the day of inoculation is to be considered as the first day.

Occasional deviations of the Vaccine Vesicle from its ordinary Appearance and Character.

Deviations are occasionally met with, even

in the genuine Vaccine Vesicle; chiefly with regard to its rise, duration, and contents.

It seldom or never appears earlier, but often later than the period already mentioned; sometimes not till after the expiration of a fortnight or three weeks; but if it then makes a regular progress, it renders the patient equally secure as if it had appeared at the usual time.

Sometimes the Vesicle is ruptured by external violence. In that case the scab will in general be less firm, and of a lighter colour. Occasionally, also, instead of the regular progress to desiccation, as above described, it passes into a state of ulceration, with a much more extended inflammation.

The contained fluid instead of being limpid as usual, is now and then found opaque.

Spurious Pustules, which afford no security against the Small-pox.

The success of the operation is doubtful,

when there is any considerable deviation from the usual course of the disease; whether premature inflammation, irritation, itching, or vesication occurs; or the progress of the vesicle is too rapid, its contents yellow or opaque, its texture soft, its centre elevated, or its form not well defined; or whether a premature efflorescence takes place, and a distinct, vivid, circumscribed areola is wanting.

This anomalous vesicle, or spurious pustule, as it is called, is more liable to be broken than the regular genuine vesicle, from its centre being more elevated, and its texture less firm. When broken, it is frequently succeeded by ulceration; or by a light brown or amber-coloured creeping scab.

Probable Causes of Spurious Pustules.

Spurious pustules may be occasioned not only by matter taken from a spurious pustule, but from matter taken from a genuine vesicle at too

late a period; or by that which has been injured by keeping, exposure to heat,* or any other cause. They may also be occasioned by using rusty lancets in inoculating;—by rude and unskilful methods of performing the inoculation; or by the genuine vesicle having been destroyed at an early stage, and the regular progress of the disease thus interrupted.

The Methods of taking Vaccine Matter for Inoculation, and of preserving and conveying it.

Matter may be taken from a genuine vesicle at any time from its commencement till the areola begins to spread; commonly till the eighth or ninth day, sometimes later, but never after the areola is fully formed.

It is to be taken by small superficial punctures, made in several parts of the vesicle with the point of a lancet introduced horizontally. Time should be allowed for the full fluid to

* See Note at page 9.

exude, which will appear on the vesicle in the form of small pellucid drops. If necessary, very slight pressure may be applied with the flat surface of the lancet, to quicken the discharge.

Great caution must be observed in this process, or violent inflammation, and extensive ulceration may sometimes ensue.

The matter may be received on the points of common lancets, when it is designed for use immediately, or within a very few days, otherwise these instruments cannot with propriety be employed, either for the preservation or conveyance of vaccine matter, as when charged with that fluid they soon rust. An ivory lancet is not liable to this objection. It may be fixed in a handle, and screwed into a case, in order to exclude air.

A common method is, to take two small square pieces of glass, on the centre of one of which the matter may be received, by applying the glass to the vesicle, punctured in several places in the manner before described, and

covered with the fluid; it may then be suffered to dry, and applied to the vesicle repeatedly. When fully charged, and dry, it is to be covered with the corresponding piece of glass, and wrapped up in writing paper, or gold beater's skin.

Matter may also be taken on thread, which, being imbued with it, must be suffered to dry, and then charged again: this process may be repeated till it is well saturated: it may be kept in a phial, or in a quill, or a piece of tobacco-pipe, stopped with white wax:—the heat necessary to melt sealing-wax might injure the matter.

Another way of preserving matter is, to take it on the end of a quill, which, when dry, may be inserted into the barrel of another quill: or if slender portions of a quill be pointed like tooth picks, a number of them, when charged, may be inclosed in the barrel of one quill. These, as well as the thread, afford convenient modes of conveying the matter in a letter to any distant place.

A small instrument made of ivory, shaped like the tooth of a comb, and pointed like a lancet, which may be called a Vaccinator, is in every respect as well adapted to the same purpose; and not being liable to bend, it is introduced into the puncture with more ease and certainty than the tooth-pick. These instruments require much less matter to charge them than thread or glass; but when they are not intended to be used soon, they ought to be repeatedly charged. When they are to be used in a short time, it is sufficient to wrap them in paper.

Matter must always be allowed to dry without heat in the shade, and be kept in a dry and cool place.

Every practitioner who has not a constant succession of patients, ought to take matter when he has an opportunity, and to preserve it for any future occasion.

The Modes of Inoculation.

The constitutional, as well as the local symptoms of the Vaccine Affection, depend in a great degree on the mode in which the virus is inserted. The smaller the wound of the skin is, the lighter in general is the disease.

Fluid matter is better than dry, when it can be procured, because it is more likely to produce infection; and the operation is more lightly and quickly performed. Hence it is evident, that in every instance where it is practicable, the patient from whom the matter is to be taken should be present, and the matter should be transferred immediately from arm to arm.

Inoculation is generally performed in the upper arm, near the insertion of the deltoid muscle; but in some adults, who are likely to use the arm much, it is more advisable to inoculate on the inside of the leg, a little below the knee.

The point of a lancet being charged, the

skin should be stretched, that the cuticle may be penetrated with more ease. A small superficial puncture is then to be made with the point of the lancet, which will be more likely to leave the matter in contact with the skin, and to produce the desired effect, if it be held nearly in a horizontal direction. It is also worthy of remark, that when held in this direction, the lancet meets with greater obstruction when it has penetrated to a sufficient depth. On the contrary, when it is inserted in a more oblique or a perpendicular direction, it often penetrates suddenly to such a depth as to cause an effusion of blood, which washes away the matter, and prevents the operation from succeeding. In order to render infection more certain, the point of the lancet may be charged with matter a second time, and wiped on the puncture.

When several successive inoculations are to be performed, the lancet should be dipped in cold water, and wiped after every puncture.

Dry matter has been sometimes known to

succeed after the expiration of several months, but that which is recent is always preferable.

Dry matter on glass may be moistened with a little cold or tepid water on the point of a lancet, allowing it some time to dissolve, and blending it by a little friction with the lancet. It must not be much diluted, but of a thick consistence. It is to be inserted in the same manner as the recent fluid.

Dry matter on the barrel of a quill may be applied without dilution, to a very small abrasion or incision of the skin: and, being held in contact for some time, and then repeatedly drawn over the part, it will dissolve and be lodged in the wound.

When ivory lancets, tooth picks, and vaccinators, charged with dry matter, are used, the matter should not be first diluted, but a puncture having been first made with a common lancet, the point of the instrument is to be inserted, and held in the puncture half a minute or more; when the matter will gradually dissolve, and remain in the part. If the part of

the instrument which is charged, be afterwards wiped repeatedly upon the edges of the puncture, it will tend to ensure success.

Thread, charged with dry matter, may be used either dry or just moistened with cold or tepid water. A slight incision or abrasion is then to be made, not more than an eighth part of an inch in length, on which a small portion of the thread is to be placed. This is to be covered with a small bit of paper, and to be retained two or three days by a mild adhesive plaister: what is called court plaister is liable to produce irritation.

Inoculated patients must be cautioned not to wear tight sleeves, and not to injure the arm by pressure, friction, or any other violence, lest extensive inflammation or ulceration should ensue.

One vaccine vessicle secures the patient from all danger of the small-pox; but in many instances it is better to inoculate in both arms, especially when the small-pox is epidemic, or

the matter is dry, or the place of the patient's residence distant.

Lancets used for inoculation should be kept clean and bright.

Constitutional Symptoms.

The constitutional symptoms sometimes occur at a very early period, but more commonly from the seventh to the eleventh day.

In some cases the patient is drowsy; in others restless. Sometimes there is a chilliness, succeeded by heat, thirst, head-ache, and other marks of febrile affection. Now and then a sickness or vomiting takes place, especially in infants.

The constitutional symptoms, of whatever kind, are in general slight and transient, and such as require no remedy.

In a great proportion of cases there is no perceptible indisposition; nevertheless, the person

vaccinated is not the less secure from the future infection of the small-pox, provided the progress of the vesicle has been regular and complete.

Care must be taken not to confound the symptoms of infantile or other diseases with those of vaccine inoculation.

Medical Treatment.

In general no medicine is required in this mild affection; but if the symptoms happen to run a little more high than usual, the same remedies are to be applied, as if they proceeded from any other cause.

No preparation is necessary; and no cathartics need be given either before or after vaccination.

Should inflammation of the arm exceed the usual bounds, which rarely happens but from tight sleeves, pressure, or friction; it may soon be checked by the very frequent application of compresses of linen dipped in water, aqua

lithargyri acetati composita, or a solution of one drachm of cerussa acetata in a pint of water. These are to be applied cold.

If the scab be rubbed off prematurely, and ulceration take place, cooling and astringent applications may be used, such as a drop of aqua lithargyri acetati, which should be allowed to dry on the part, and then be covered with compresses, dipped in water, or any of the saturnine applications above mentioned, and frequently renewed.

When the ulceration is deep or extensive, a poultice, either of bread and milk, or of bread with any of saturnine preparations may be applied, as the case seems to require. They must never be applied till they are nearly, or quite cold.

In such foul and obstinate sores as resist the foregoing applications, the unguentum hydrargyri nitrati, the argentum nitratum, or other similar applications are sometimes resorted to with advantage. A single dressing with the sesubstances is usually sufficient; after which the sore heals under the mildest applications.

Spurious pustules are frequently followed by ulceration at an early period. This ulceration is to be treated in the same manner as if it proceeded from genuine species.

An assurance of perfect security from vaccine, inoculation can only be obtained by carefully observing the whole progress of the disease. If any doubt remain, the operation ought to be repeated.

When the patient has been previously exposed to the infection of the Small-pox, that disease will be superseded more or less, according to the time which is suffered to elapse before the inoculation of the Cow-pock.

The advantages of vaccine inoculation being now fully ascertained, it is the duty of every member of society, and particularly of every member of the medical profession, to discourage the inoculation of the small-pox.

AN ADDRESS

TO BE PRESENTED BY

CLERGYMEN AT THE BAPTISM OF CHILDREN.

To Fathers and Mothers.

You who are parents must feel yourselves not less bound by religion, than prompted by affection, to guard your child from every impending evil; and especially from infectious diseases endangering life. No human malady can give more serious cause of alarm than the Small-pox. When taken in the natural way it is, as you well know, violent, painful, and often fatal. Even in those who recover from it, the countenance is permanently disfigured, or the constitution receives some irretrievable

injury, by loss of sight, deafness, tedious ulcers, white-swellings, consumption, &c. In the small-pox, communicated by inoculation, there is certainly less danger; but to insure success, the most anxious attention and nicest management are requisite for a length of time. Notwithstanding every precaution, the inoculated small-pox has, in many cases, proved fatal: and it is further highly objectionable, since, by spreading infection, it endangers the lives of all persons in the neighbourhood, who have not previously had the disease. A mild and certain preventive of the small-pox, was a very few years ago providentially discovered by the JENNERIAN INOCULATION OF THE COW-POCK. This, after the strictest inquiry, has been approved, and recommended by the British Parliament, and is now extensively practised, under the patronage of their Majesties, and the whole Royal Family. The new inoculation may be safely performed at every season of the year, and at every period of life, since it occasions no material disorder, nor is attended with any

danger whatever. At the same time no infection is communicable from the persons inoculated to others with whom they have intercourse. Thus this simple and easy process, without endangering the community, preserves all those who undergo it, from a most loathsome disease; and never excites in the constitution the dreadful maladies above-mentioned, which so frequently succeed both the natural and inoculated small-pox.

That you might not remain ignorant of so inestimable a blessing, this short statement is presented to you; and as you value the life of your infant, and the safety of your neighbourhood, you will immediately avail yourselves of the advantage offered to you; for doubly poignant must be the sorrow, if, by neglecting so to do, your child should perish, or be materially injured by the small-pox.

(Signed)

Minister of