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Contributors

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AN INQUIRY

ON THE SUBJECT OF

VACCINATION;

ADDRESSED TO THE

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

BY

BENJAMIN RIDGE, M.D., M.R.C.S.E., &c.

AUTHOR OF A PAPER "ON A SYSTEM OF GLOSSOLOGY; OR, THE ADDITIONAL MEANS OF DIAGNOSIS
OF DISEASE TO BE DERIVED BY INDICATIONS AND APPEARANCES OF THE TONGUE."

ALSO, "ON THE PHYSIOLOGY OF THE UTERUS, PLACENTA, AND FŒTUS, WITH
OBSERVATIONS ON THE MEMBRANA MECONII AND RETE VASCULARE,
NEWLY-DISCOVERED STRUCTURES EXISTING IN THE
FŒTUS AND YOUNG OF MAN AND ANIMALS."



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"I am pleased at seeing the investigation so generally entered into ; and I hope that the spirit with which this important inquiry will be prosecuted may be tempered with that calmness and moderation which should ever accompany philosophical researches."—*Dr. Jenner, Preface to Second Treatise.*

"Ere I proceed, let me be permitted to observe that Truth, in this and every other physiological inquiry that has occupied my attention, has ever been the object of my pursuit ; and should it appear in the present instance that I have been led into error, fond as I may appear of the offspring of my labours, I had rather see it perish at once than exist and do a public injury."—*Dr. Jenner, Second Treatise, p. 3.*



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TO THE PRESIDENT AND FELLOWS OF THE ROYAL MEDICAL AND
CHIRURGICAL SOCIETY.

GENTLEMEN,—

A question has been raised among the members of your Society on the value of Vaccination. Its efficacy has been subjected to suspicion, and doubts may consequently arise in the minds of those who never doubted before, and the opinions of others who have combated the doctrine which inculcates its strict performance may receive a confirmation deeply mischievous in its results.

To you the profession will naturally look for the enunciation of some definite principles in relation to the subject; while the public at large may expect to receive at your hands something like an authoritative decision, giving them an assurance that agreement upon a matter which increases daily and hourly in importance is not altogether impossible.

The experience of more than half-a-century should, it might have been thought, have afforded a sufficient test of the merits of a practice which is in operation every day and everywhere; and it appears to me that nothing short of the production of certain new, important, self-evident, and incontrovertible facts bearing upon the subject of Vaccination, will be held to justify your Society in countenancing a suspicion of its efficiency.

After what has recently passed, your Society stand committed to a complete and candid investigation of the whole subject, or

“Our doubts are traitors,
And make us lose by fearing to attempt
The good we oft might win.”

As a fellow of your Society, I feel desirous of contributing some results of my own experience and reflection connected with the question under agitation, and beg, therefore, to lay before you the following observations for your consideration.

I am, Gentlemen,

Your sincere fellow-labourer,

BENJAMIN RIDGE.

Putney, April, 1851.

AN INQUIRY, ETC.

THE medical republic has its paroxysms and its great wordy conflicts, the fruitful subjects of which are epidemics and their sequences, their laws or their causes; and we find that the army engaged on each side more frequently end their disputes, after much talking and writing, precisely where they began them, than by any decisive victory on either side; the war terminating for a time as it were by a common consent or from exhaustion, only to break out again on the advent of another paroxysm. These periodical polemical campaigns are generally marked by more or less of rancour, or by opiniativeness, than of philosophy, and give rise to infinitely more ink-shed than argument; tending too often to justify the Spanish syllogism of Benito Geronimo Feijoo, who says, "That which is dubious is unknown: in physic almost everything is dubious: therefore almost everything in physic is unknown. For," he continues, "I see physicians almost universally divided in their practice. And if they have not ascertained TRUTH, what need I apologise for my doubts? I have not read many medical authors, but I have read enough to convince me that there is hardly an assertion in physic uncontroverted. If I had read more, probably my doubts would have been increased, which was exactly the case of Ramazzini, who says of himself, "*Idem prorsus mihi evenire sentio ac Terentiano seni, qui cum in filii sui causâ plures advocatos accersisset, eosque inter se pugnantes deprehendisset, incertior (inquit) multo sum quamdudum.*"

Vaccination, the subject of the latest medical paroxysm, suggests a variety of topics for consideration—topics in regard to which a vast amount of practical faith is found in daily operation among mankind, as well as no small degree of prejudice, which the dissemination of scientific truth has hitherto failed to explode.

I enter the lists as the advocate of no party. If I thought I should serve the interests of the profession as well by my silence as by my plain speaking, and had I not what I conceive to be new views to explain or enforce, I should refrain altogether from polemical discussion, as wiser men have done; but being impressed with the conviction that there is a vein of truth to be explored in connexion with the ideas I have been led to entertain on the subject of Vaccination, I feel bound to give them utterance at the present crisis.

In 1842 I made the discovery of two new membranes in the foetus and young of man and animals, and published an account of them in 1845. The first was a true membrane for the meconium; the second a vascular net-work of vessels lying be-

tween the meconic membrane and the true mucous membrane of the intestines, forming also a true membrane, which I named the Rete Vasculare.

The discovery of these hitherto unrecognised structures of course set me upon the investigation of their true nature and uses in the animal organism, in the hope of arriving at sound philosophical conclusions respecting them. From what I then published I must now extract as follows :—

“When Nature provides organisms she also provides uses for them. It seems apparent that the meconic membrane is an organ of nature, made to detain effete matters within the alimentary canal, instead of their lodging on the mucous membrane; and that its integrity is kept up by the rete vasculare supplying it with blood. It seems meant, too, to prevent the bile from flowing into the alimentary tube, where it could have no legitimate duty to perform, as chylication is not necessary to foetal life; for if chylication were performed, the bile must have something to act upon, and the product of this operation should be, or ought to be, used again. Now there is no necessity for such an action, or such a product; as, in the first place, where this action exists there must be waste, and where there is waste there must be repair. How can there be waste in a purely vegetative existence, such as is the foetal? What could be given to the foetus to support waste if chylication were performed? No product or matter can make its way into the alimentary tube save in the shape of effete excretions, and that must be considered as the ultimate end of all such matters. And if bile did get into the foetal alimentary canal, it could only mix with the meconium or effete matter already there; but this I believe to be of rare occurrence. In the absence of the meconic membrane and rete vasculare, the meconium would rest directly upon the true mucous membrane covering the muscular coat of the bowels. In that case, there would be nothing to prevent chylication and absorption of the contents of the small intestine, as the mouths of the absorbents, lacteals, &c., terminate in the mucous membrane; therefore the meconic membrane and rete vasculare are barriers to the action of these vessels, whose actions, through these phenomena, must of necessity be extremely limited. Were it not for the intervention of these new structures, there would be no hindrance to the absorbents acting on the contents of the bowels, and taking up and carrying into the system—what?—an excrementitious deposit! The meconic membrane is plainly a false mucous membrane, which is present for a certain time only and for a specific purpose in the child or animal after birth; as we find that that portion of it which is situated in the rectum comes away, in some instances, entire, with its contents, as a *cul*

de sac ; though probably, in the more numerous cases, it breaks and comes away piecemeal with portions of the meconium. It is by no means a smooth membrane, but appears laminated externally, and to have portions of its internal surface dipping into the meconium, in like manner as the arachnoid membrane dips into the brain.

“The rete vasculare appears to be provided by Nature for the nourishment of the meconic membrane, as well as the mucous membrane on which it lodges, and to sustain the functional integrity of both during foetal life. As far as I have been able to observe, it is the most beautifully-organised piece of network of blood-vessels the eye ever saw ; and, when first taken out of the gut of a strangled puppy or kitten, most brilliant in colour. It may probably assist in keeping up a highly-organised state of the alimentary canal during foetal life, which, with the lungs, appear to be the only organs not performing functions precisely similar to those which they are afterwards called upon to do. I may also add another reason for supposing the meconium to be an independent deposit of any secretion of the liver, though this opinion differs entirely from received authority—which is, that as the rete vasculare and meconic membranes are structures peculiar only to foetal life, they must disappear altogether some time after birth, and Nature must provide for this first step. My impression is, that the bile traverses the whole length of the alimentary canal from the duodenum to the anus, and is, in foetal life, the proper menstruum to lubricate the rete vasculare and the meconic membrane ; whilst the meconium itself, by the aid of its antiseptic properties, prevents the chylicification of these structures. There can be no doubt, however, that an attempt at digestion and chylicification does occur in foetal life, as the piece of orange-coloured fecula on the external meconic sac and membrane of my first preparation fully demonstrates ; and also that this little piece of fecula passed down the alimentary canal between the rete vasculare and meconic membranes. This very act must have ruptured the union of the two membranes in the track down which it passed, as it is carried on by the minutest network of blood-vessels ; for previous to washing it, as before described, I noticed the unattached surface thickly strewed with hair-like vessels.

“As soon, no doubt, as the meconium has passed out of the system, the bile gets access to the centre of the meconic sac, so that chylicification is pretty certain to ensue, as both the rete vasculare and meconic membrane are inclosed and surrounded by bile, which serves to digest them ; and hence I have been led to the conviction that this action gives the orange-colour to the first infant stool. The great amount of organic matter

in a state of decomposition acted on by a large supply of bile, already prepared throughout its whole extent to chylify it, would produce this result. If the orange-coloured stools of children are examined, they will be found to contain a very large amount of coloured mucous matter, in which is embedded the curdy portions of the milk.

“And if these new structures perform highly important duties during foetal life, they appear to have equally important uses after the birth. From this period all animals are as dependent on what they make within themselves by the decomposition and appropriation of their own tissues as on what they take of foreign substances to support life. The action of the oxygen imbibed on the animal tissues constantly consumes them; and these being in an hourly stage of decomposition produce carbon, which they breathe, and ammonia, which generates nitrogen, the active and primary agent of their whole vital system. What is there to interpose between the metamorphosis of existing tissues in the new-born child, supposing, as we have hitherto done, that there are no such structures as the meconic membrane and rete vasculare? Liebig has founded a beautiful theory on this inquiry, which seems to carry conviction with it, and would live and last undisputed, if the meconic membrane and rete vasculare were undiscovered things. He says—

“‘Now the circulation in the young animal is not weaker, but, on the contrary, more rapid; the respirations are more frequent; and, for equal bulks, the consumption of oxygen must be greater rather than smaller in the young than in the adult animal. But since the metamorphosis of organised parts goes on more slowly, there would ensue a deficiency of those substances the carbon and hydrogen of which are adapted for combination with oxygen, because in the carnivora it is the new compounds produced by the metamorphosis of organised parts, which Nature has destined to furnish the necessary resistance to the action of the oxygen, and to produce animal heat. *What is wanting for these purposes an infinite WISDOM has supplied to the young animal in its NATURAL FOOD.*

“‘The carbon and hydrogen of butter, and the carbon of the sugar of milk, no part of either of which can yield blood, fibrine, or albumen, are destined for the support of the respiratory process, at an age when a greater resistance is opposed to the metamorphosis of existing organisms, or, in other words, to the production of compounds, which in the adult state are produced in quantity amply sufficient for the purpose of respiration.

“‘The change and metamorphosis of organised tissues going on in the vital process in the young animal consequently yield, in a given time, much less carbon and hydrogen in the form

adapted for the respiratory process than corresponds to the oxygen taken up in the lungs. The substance of its organised parts would undergo a more rapid consumption, and would necessarily yield to the action of the oxygen, were not the deficiency of carbon and hydrogen supplied from another source.'

"Now this is exactly the light in which we are to consider these new structures. Does not waste begin with the first cry of the infant? The moment of birth is the moment for receiving oxygen into the system, and the moment for commencing the decarbonisation of blood in the lungs. The carbon thus instantaneously generated there is expired in its first feeble cry. It has taken no milk, and consequently no caseine to add to its organisms; no butter (fat), nor sugar of milk, to make carbon or hydrogen; nor does it require these foreign assistances. The oxygen already begins acting on those extensive animal tissues no longer required for their foetal purposes, viz., the meconic membrane and rete vasculare, which are supplied to it by Infinite Wisdom at its birth, *and in the entire absence of its natural food.* A child thrives better for the first few days *in the entire absence of its natural food.* I have had abundant proof of this. . . . Children, however, cannot live without food any more than adults; they may be put to the breast, because the sucking of the nipple, even when no milk is present, causes them to draw in a greater quantity of oxygen, and practises them in deglutition. . . . The oxygen then has time to consume the superficial portions of the membrana meconii, whilst the first milk (beautifully and wisely made aperient!) detaches the meconium from its membrane, and assists in its expulsion from the system. The meconic membrane afterwards becomes very pulpy and mucous, the rete vasculare loses its supply of blood, and the milk gradually taken up by the child becomes, with the bile, its proper menstruum. . . . The smell of its stool indicates the large amount of decomposed animal matter of which it is composed; the curdy state of the milk in it, and the innumerable globules of air, show the acid stage and the highly fermenting process going on. . . . The early months of infancy require the simplest yet most judicious management. How long the meconic membrane and rete vasculare take to be entirely decomposed and carried off I am not in a position to determine; *the time, no doubt, varies according to the constitution of the child, but this is guided by certain laws.* The repair of waste is probably made up by the nitrogenised constituents of the caseine of its parent's milk, on the one hand, and the greater amount of nitrogenised constituents of its own organisms, by the decomposition and appropriation of the meconic membrane and rete vasculare, on the other. The non-nitrogenised

constituents of the milk act as a foreign menstruum on the nitrogenised portion of these animal tissues, the product of which is carried out of the system in the form of effete matter. The difference, therefore, in a thriving child and a poor, thin, atrophous one appears to me to consist in the power within it, on the one hand, to dissolve its new structures and free the absorbents, as well as on the power of the absorbents themselves to take up nourishment; and, on the other hand, the retention and undecomposed state of the rete vasculare prevents the absorbents from acting, by closing their mouths; for we find some children, in a state of atrophy threatening life, suddenly gaining lost ground, and becoming fat and thriving. As these phenomena seem inseparably connected with the treatment of infancy, I will conclude this treatise with a few observations which the discovery of these new structures has led me to make."—*pp.* 68-76.

"Having made many dissections of the intestines of fœtuses of various ages, I have found both the membrana meconii and the rete vasculare more particularly developed in the rectum and throughout the colon, and certainly present along the whole alimentary track, though less distinct from the colon to the œsophagus than in the colon and rectum."—*p.* 55.

"I have found these structures to exist in the kitten, the puppy, and the young pig, and this in scores of subjects; I therefore reasonably conclude that it is natural to all young animals."—*p.* 56.

"As fœtal fœces are deposits for a specific purpose, and differ so largely from the fœces of the child after birth, they must have an investing membrane, differing also in character from the true mucous membrane. The true mucous membrane, as it appears in adult life, cannot, in the first place, be a proper membrane for such fœcula in the fœtal life; and secondly, if the mucous membrane had no protection, how could it be suddenly called upon to perform such opposite duties as necessarily ensue in the change from fœtal to individual existence? The entire removal of effete matter of a meconic character from a large mucous membranous surface, such as the alimentary canal, on which it has lodged for so many months, would leave this mucous membrane in a bare and very unprotected state, and render it incapable of retaining its integrity, especially as it is absolutely required that all the meconium should come away. It would be necessary, also, that the whole mass of mucous membrane should be renewed, and that, too, very quickly.

"Would not the powers of infancy be overcome in this attempt? They could surely not withstand so rapid a change, and the renewal of a surface so great in extent as the mucous

surface. Nor could any purely mucous membranous surface withstand the injurious effects of the presence of such large quantities of oxygen as the child begins consuming immediately after birth. As we are dependent on the decomposition and appropriation of our own animal tissues to sustain our vital energies, which constant wear impairs, and but for these actions they would be always causing obstructions, we cannot get rid of them in any other way. That they are made to serve a second use, even when they have lost their first powers or duties, is an end only to be conceived and executed by Infinite Wisdom.

“ ‘The most ordinary experience,’ says Liebig, ‘shows that at each moment of life, in the animal organism, a continued change of matter, more or less accelerated, is going on: that a part of the structure is transformed into unorganised matter, loses its condition of life, and must be again renewed.’

“We cannot imagine that Nature has left the young of man and animals wholly dependent on a precarious external or foreign supply of food, to carry on the vital principle in the earliest stage of their existence; especially when we consider that by far the greater portion of the human family are in such wretched circumstances that even necessities for the parent are wanting. Such a thought would violate the wisdom and justice of her laws. Nature’s first law is creation; her second is to maintain what she has created. As long as the seed is kept in the condition of static rest, it contains unimpaired, even for years, those qualities which, when brought forward through the agency of other substances, and by new actions, germinate into a plant. The primary element of the vitality of the seed, the nitrogen, is contained within itself. Now, phenomena nearly allied to this occur in the young of animals and in the infancy of man.

“The child, and, in fact, the young of every animal, is born with the primary element of vitality, the nitrogen, in excess, or, more correctly speaking, with those elements which produce it. These, in the process of conversion into nitrogen, require an excess of alkaline nourishment to act properly upon them. At the maturity of utero-gestation the animal is born, and is born, too, with highly organised and consequently nitrogenised powers, which are to be acted upon by the diet which custom has assigned to babes, and which reason sanctions even without the aid of philosophy; and this diet, in the state in which it is given, is, strictly speaking, of an alkaline character. But in what form do the nitrogenised elements exist in the child? In what shape are they to be found, to furnish for a certain length of time elements for respiration, for the repair of waste, which commences from the earliest period of existence, and for the *repro-*

duction or increase of organisms? The infant receives oxygen from the air, even before any aliment is given to it, which must act on its own organisms to produce carbonic acid gas from its lungs in every expiration. Combustion must also begin early, in order to generate heat, and heat must have something to act upon. . . . It must be known, and well known, to those who have had much practice in obstetrics, that it often happens that children take milk which has been eliminated from irregular or imperfect supplies of blood, as well as from impure blood, through illness or debility of their parents, and which has contained but a small portion of caseine, when compared with the absolute quantity required. Yet they still live on: the primary element of vitality is still in force. On what do they depend, supposing, as is sometimes true, that the nitrogenised elements of the milk are deficient, if they have not something within themselves to combine with the non-nitrogenised elements supplied? Nature is too wise to overlook a consequence so vital as the chance of her offspring not obtaining at such critical times the elements which they require to sustain life. Now, Nature has amply provided for this end certain structures which have their uses both in foetal life and after birth; and these structures are, the *Membrana Meconii* and *Rete Vasculare*.”—*pp.* 48-51.

“In all arguments, the suspicion seems never to occur, that something is still undiscovered which would solve the question at once.”—*p.* 77.

“Considerable modifications of the treatment of infancy, from the principles at present laid down, must, I think, ensue if the presence of the meconic membrane and rete vasculare is proved to exist.”—*p.* 78.

“The assurance I have of the existence of the meconic membrane and rete vasculare, and of their probable uses both in foetal life and after birth; the duration of time these structures take in their decomposition before they entirely leave the system, and their beneficial uses during the time in which they are slowly going through this process; the activity, too, of their conversion into vital agents, and the changes thereby finally effected in the whole system, in every way in which animalised matter performs its part in the grand series of operations connected with our subject, lead me to consider them in connexion with what might seem, at the first glance, of very remote affinity to them, but is more closely related than may be supposed. I allude to *VACCINATION*.

“Vaccination is now enjoined by Act of Parliament, and Ministers for the Home Department are bound to keep a watchful eye on the advent of small-pox. IT MAY HAPPEN THAT SOME CONSIDERATION WILL HEREAFTER BE PAID TO THE MOST FITTING

TIME TO VACCINATE AN INFANT; AN UNCONSIDERED POINT AT PRESENT, THOUGH NOT AN UNIMPORTANT ONE. Whether my views upon this subject are sound or not, I feel I should do wrong if I did not direct attention to it. Children, with the commonest care, have much fewer and slighter maladies while under three months old than they are liable to after that age. Of all the diseases which affect life in the first three months, I believe small-pox to be the most rare. From what I have said in connexion with the presence of the membrana meconii and rete vasculare, it will be seen that light diet, with free air and oxygen, so act upon these structures as to support life vigorously and healthfully; *and in doing this, infants are more able to throw off or avoid diseases of a character like the small-pox.* If infants, therefore, have this innate power of counteracting natural diseases, *they have equally the power of throwing off that which is thrust upon them, or whatever they are inoculated with.* I do not think that there is as much dependence to be placed in the preventive action of Vaccination, if performed within the first three months, as when it is done after that time; and though it has become the law to vaccinate all children, it is so far a human law, with its attendant imperfections, in opposition to the laws of Nature, which have not been first sufficiently considered. If it is now a wonder that small-pox is taken after Vaccination (when performed according to Jenner's rules), it may hereafter be shown to be no wonder at all. Experience has led me to think that Vaccination should not be performed on an infant *under three months old*; or, if it must be done previous to this time for the parent's satisfaction, that it should be done again within the year *for the child's safety.*

" Since I have discovered the presence of these new structures and reflected on their probable uses, I have not vaccinated any child under three months old. No child that I have attended during the last two years has ever had the small-pox in that time; and none that I have vaccinated after the age of three months have failed in taking the virus. Before that age, the proportion was large of those I had to re-vaccinate a second and even a third time, though the virus used in the first operation was taken from the same subject, and succeeded in others. What, then, was the cause why these threw off the Vaccination, unless, indeed, it was the power of the healthy vital agents, in course of metamorphosis, resisting the disease? When parents were alarmed at their children not taking Vaccination, the consolation I gave them was satisfactory enough: if they would not take what was positively inserted *in substance* into their systems, they would not take that which could only come insidiously, and through impalpable agencies.

"I may say that the beneficial results of Vaccination are thwarted by its being performed too early, or previous to the age of *three or four months*. If performed after that time, there will be more security against small-pox, and more likelihood of ultimately exterminating it; though it is my firm belief that even Vaccination will be hereafter superseded by more philosophical prophylactic measures. This, however, is not a subject for theoretical speculation. The powers that be, and to whom are delegated the administration of the laws for the benefit of the whole community, can put it to the test, by promoting inquiries and collecting statistical observations.

"A short time would test the truth or fallacy of the rule I have prescribed to myself, viz., never to vaccinate under three months; but where I did, I did so for the parent's satisfaction only, not considering any such Vaccination sufficiently protective unless it was performed a second time, after the lapse of a few months.

"I trust, in conclusion, that the discovery of the *membrana meconii* and *rete vasculare* may lead our eminent men to the study of embryology and the treatment of infancy in connexion with these new structures, and to their uses after birth; for I feel assured that no true doctrines can be founded on the physiology or pathology of the embryo and the infant, without *their* demanding a large share of their consideration; and that no 'TREATMENT OF INFANCY' CAN BE ADOPTED WITHOUT REFLECTION ON THESE STRUCTURES.

"Much good or evil rests on this; for as in the prince's so in the peasant's child, this truth will hereafter be proved—that on early treatment depends the future vigour of the man: on the treatment of the infant prince depends the future vigour of body and strength of mind of the king."—*pp.* 85-88.

As the above observations, directly pointing to the subject now in hand, were made a few years since, I may be excused for saying that they have always been present in my mind for further inquiry and elucidation—with what results I will presently show.

In reading carefully through Dr. Jenner's first treatises on his new discovery, that which is most apparent is the spontaneous inoculation of persons in adult life by actual contact with the disease in the cow—which persons were found to resist the contagion of small-pox as well as those artificially inoculated for that disease. Dr. Jenner then tried the operation upon adults wherever they would submit to it, as well as on all young persons under the adult age, with apparently the same results. After this he tried it on children; and all that seems wanting to complete his great discovery is that of THE MOST FITTING

TIME FOR THE PERFORMANCE OF THE ACT, SO AS TO INSURE IMMUNITY FROM SMALL-POX IN AFTER-LIFE. No one doubts the value of the measure; and it is a reflection on the age if, after the lapse of half a century, this great man's labours have borne no satisfactory fruit, and Vaccination be regarded as affording no certain assurance in after-life of immunity from small-pox. I have therefore gone back to the original treatises of Dr. Jenner in search of information bearing on the question; presuming that he who brought all his powers of thought to bear upon so great a subject would scarcely neglect anything that was of importance to make it complete, except that which must of necessity be left to time alone to evolve.

Now, there does not appear throughout his writings, nor in any later or more modern productions on this subject, any allusion to the period of life when Vaccination is to be performed, as connected in the remotest degree with the safety of the individual vaccinated. Whatever has been written or said on the proper age for Vaccination has been rather the expression of opinion than the fruit of philosophical deduction. The following, for instance, will verify these observations.

Dr. Alexander Knox has written a very able article "On the existing state of our knowledge of Vaccination," &c., in the November and December numbers, 1850, of the "London Journal of Medicine," which is well worth an attentive perusal by all who feel interested in this subject. At page 1145 of that journal, speaking of the age for vaccinating an infant, he says: "Heim advises that no child should be vaccinated before the termination of the first year, *from a theoretical belief that, during that period of life, there exists in the constitution something resistive of the protective influence.* In this mode of accounting for failure of Vaccination, and more especially in the advice founded on it, it is impossible to concur, as no sufficient or valid proof has been offered in its support, and the reasons for an early operation are too cogent to be set aside on any speculative grounds. Ryan advises the operation to be performed after the sixth week, and Cazenave and Schedel not before that period without pressing indications.

"In all cases where a child has been exposed to the contagion of the casual small-pox, we should perform the operation of Vaccination forthwith, in the hope that the milder may anticipate the more malignant malady. The results of our interference will, however, prove to be various, according to the period at which it takes place. Where the vaccine lymph is inserted during the incubative, but still latent, stage of small-pox, the effect, as stated by Gregory, is, that the latter disease runs through its course unmodified, whether the cow-pock, as is

most usual, either does not advance at all, or at least tardily and imperfectly, or whether, as may more rarely be observed, it passes through its usual process, at the same time as the casual disease. Cazenave and Schedel, however, state that in vaccinating an infant exposed to variolous contagion, the small-pox will sometimes adhere to its usual progress, but more frequently assume a modified type; and that occasionally even a confluent form of the disease will pursue its regular course, concurrently with the vaccine eruption. At any rate, the prudent course, in case of exposure to variolous infection, is at once to vaccinate in the hope that the germ of the casual disease may not yet have been imbibed."—*Lond. Jour. of Med.*, p. 1146.

In this latter view I entirely concur.—Dr. Jenner mentions one case of the Vaccination of an infant newly born:—

"Wishing to see the effects of the disease on an infant newly born, my nephew, Mr. Henry Jenner, at my request, inserted the vaccine virus into the arm of a child about twenty hours old. His report to me is, that the child went through the disease without apparent illness; yet that it was found effectually to resist the action of variolous matter with which it was subsequently inoculated."—*Second Treatise*, p. 62.

The above proves nothing but this fact, viz., that an infant just born may be vaccinated, and go through the process in the same way, and apparently with the same success, as an adult. At what time it was subsequently inoculated and resisted that action he does not say, nor could he nor any other physiologist complete his deductions on this subject, if he reasoned without the knowledge of facts deeply bearing thereon, which were yet undiscovered, and which, when discovered, would have a claim to be viewed in all their relations to the subject under consideration.

Dr. John Webster's cases, which will be found in the "*Lancet*" of 8th March, 1851, in the account of the transactions of the Royal Medical and Chirurgical Society of February 25, appear to bear upon this point. Dr. Webster has been kind enough to furnish me with the following particulars:—

"24, Brook-street, 24th March, 1851.

"MY DEAR SIR,—

"In reference to your inquiries, the following are the dates, which I have in the handwriting of the father of the different patients:—

"H. W. R. (not N., as reported.) Born August 12, 1827; vaccinated November 29, 1827; small-pox, September, 1833; ditto, April, 1838; died in India April 13, 1850 (of confluent small-pox).

"F. D. R., a brother; vaccinated 16th May, 1826; does not state exact age, but was, like the former, young. Had small-pox September, 1833; ditto, April, 1838.

"W. C. R., the eldest brother; vaccinated 12th January, 1825; exact age also not stated, but was then young. Had small-pox April, 1838.

"I hope the accompanying statement will answer the purpose you have in view; and permit me to add, it gives me much pleasure to reply to your communication.

"Very truly yours,
"JOHN WEBSTER."

(Signed)

It is here seen that the first case of Vaccination was performed under the fourth month, evidently not protective to the subject. Neither were the attacks of genuine small-pox of any avail to keep off the third and fatal attack. The other subjects were, no doubt, vaccinated early; the exact ages appear unknown.

Now Heim, a close observer, would reason thus: that there was in the system at that early age "*something resistive of the protective influence of Vaccination.*" Dr. Knox would justly say that in this "*it is impossible to concur, as no sufficient or valid proof has been offered in its support.*" I, therefore, step in between the two opinionists, for such they really are, and offer that valid proof of the fact of the great transition, and consequently resistive, state an infant's secretions are always in during the influential presence of these newly-discovered structures, particularly the rete vasculare.

As cases of small-pox have appeared more prevalent of late years without explicit cause, I wrote the following letter to Dr. Gregory, and received from him permission to publish his reply:—

"Putney, 29th March, 1851.

"MY DEAR SIR,—

"As I am putting together a few notes on Vaccination, will you be kind enough to inform me the ages of infants usually brought to the Vaccination Hospital for Vaccination, and how early you vaccinate (*there*) infants brought to you?

"Considering you a great authority in these matters, I shall feel obliged by your opinion, at what age an infant should be vaccinated to secure the greatest amount of safety in after-life. Your early answer will much oblige,

"My dear Sir,
"Yours very truly,
"BENJAMIN RIDGE.

"Dr. Gregory, M.D., 6, Camden-square.

"P.S. Will you also favour me with your opinion at what age of the pustule virus should be taken for further use, and whether you have any rules, according to the character of the pustule, for so doing, as some mature sooner than others."

"No. 6, Camden-square, C. N. T., March 21, 1851.

"DEAR SIR,—

"We receive infants and children at all ages, from a month old to eight or ten years, for Vaccination; but the great majority come to us at four months old (from four months to six months).

"I think four months the *best* age for Vaccination, all things considered.

"The eighth day is the best day for taking matter. The vesicle is then ripe, and fruit ought to be plucked when it is ripe. You may pluck the fruit earlier, and you may pluck it later, and it *may* be very good; but you would prefer taking it when it is *ripe*.

"Nothing but long habit and experience will give to a surgeon a perfect and intimate knowledge of the vesicle which should be used for the purpose of propagating the disease.

"There are some vesicles which ought *never* to be used for that purpose, but I could not describe them on paper with any chance of being understood by others. Clinical instruction can *alone* give this *knowledge*.

"Believe me,

"Very truly yours,

(Signed)

"GEORGE GREGORY.

"Benjamin Ridge, Esq., M.D."

I have been making many inquiries since this subject was mooted at the Royal Medical and Chirurgical Society, and find that whenever small-pox has occurred after Vaccination, Vaccination had been performed on these subjects under three months old; the number of these cases, I regret to say, is very great.

I shall here make a few extracts from Dr. Jenner's early treatises, as to the susceptibility of small-pox after a previous infection; on inoculation from vesicles of what may be termed a bastard pock; on the old methods of inoculating from morbid virus; and other points bearing on this important subject.

SUSCEPTIBILITY OF SMALL-POX.

"It should be remembered that the constitution cannot, by previous infection, be rendered totally unsusceptible of the variolous poison, neither the casual nor the inoculated small-pox, whether it produces the disease in a mild or in a violent way,

can perfectly extinguish the susceptibility. The skin, we know, is ever ready to exhibit, though often in a very limited degree, the effects of the poison when inserted there; and how frequently do we see among nurses, when much exposed to the contagion, eruptions, and these sometimes preceded by sensible illness? Yet should anything like an eruption appear, or the smallest degree of indisposition, upon the insertion of the variolous matter on those who have gone through the cow-pox, any assertions respecting the peculiarities of the disease might be unjustly discredited.

“I know a gentleman who, many years ago, was inoculated for the small-pox; but having no pustules, or scarcely any constitutional affection that was perceptible, he was dissatisfied, and has since been repeatedly inoculated. A vesicle has always been produced in the arm in consequence, with axillary swelling and a slight indisposition. This is by no means a rare occurrence. It is probable that a fluid thus excited upon the skin WOULD ALWAYS PRODUCE THE SMALL-POX.”—*Second Treatise*, 1799: p. 44.

“On the arm of a person who had gone through the cow-pox many years before, I once produced a vesication by the insertion of variolous matter, AND WITH A LITTLE OF THE FLUID (VIRUS) inoculated a young woman, who had a mild but very efficacious small-pox in consequence, although no constitutional effect was produced on the patient from whom the matter was taken. . . . The following communication from Mr. Fewster affords a still clearer elucidation of this fact. Mr. Fewster says—‘On the 3rd April, 1797, I inoculated Master H——, aged fourteen months, for small-pox. At the usual time he sickened, had a plentiful eruption, particularly on his face, and got well. His nursemaid, aged twenty-four, had, many years before, gone through small-pox in the natural way, which was evident from her being much pitted with it. She had used the child to sleep on her left arm, with her left cheek in contact with his face, and during his inoculation he had mostly slept in that manner. About a week after the child got well, she (the nurse) desired me to look at her face, which, she said, was very painful. There was a plentiful eruption on her left cheek, BUT NOT ON ANY OTHER PART OF THE BODY, which went on to maturation.’—p. 46.

“Doubting the purity of this small-pox, the author goes on to say—‘On inquiry, I found that three days before the appearance of the eruption she was taken with slight chilly fits, pain in her head and limbs, and some fever. On the appearance of the eruption these pains went off; and now (the second day of the eruption) she complains of a little sore-throat. *Whether the above symptoms are the effects of the small-pox, or a recent cold,*

I do not know. On the *fifth day* of the eruption I charged a lancet from two of the pustules, and on the next day I inoculated two children, one two years, the other *four months old*, with the matter. At the same time I inoculated the mother and eldest sister with variolous matter taken from Master H——. On the fifth day of their inoculation ALL their arms were inflamed alike; and on the eighth day the eldest of those inoculated from the nurse sickened, and the youngest (*four months old*) on the eleventh. They had both a plentiful eruption, from which I inoculated several others, who had the disease favourably. The mother and the other child sickened about the same time, and likewise had a plentiful eruption.

“ ‘Soon after a man in the village sickened with the small-pox, and had a confluent kind. To be convinced that the children had had the disease effectually, I took them to his house, and inoculated them in both arms with matter taken from him, but without effect.’

“ ‘These,’ says Jenner, “are not brought forward as uncommon occurrences, but as exemplifications of the human system’s susceptibility of the variolous contagion, although it has been previously sensible of its action.

“ ‘Happy is it for mankind that the appearance of the small-pox a second time on the same person, beyond a trivial extent, is so extremely rare that it is looked upon as a phenomenon.’—*Second Treatise, p. 47.*

Dr. Jenner quotes Mr. Wither’s case from the fourth volume of the “Memoirs of the Medical Society of London :”—

“ ‘Mr. Richard Langford, a farmer of West Shefford, in this county (Berks), about fifty years of age, when about a MONTH OLD, had the small-pox at the time when three others of the family had the same disease, one of whom, a man-servant, died of it. Mr. L.’s countenance was strongly indicative of the malignity of the distemper, his face being so remarkably pitted and seamed as to attract the notice of all who saw him, so that no one could entertain a doubt of his having had that disease in a most inveterate manner.

“ ‘Mr. Withers proceeds to state that Mr. L. was seized a second time, had a bad confluent small-pox, and died on the twenty-first day from the seizure; and that four of the family, and also a sister of the patient, to whom the disease was conveyed by her son’s visiting his uncle, falling down with the small-pox, fully satisfied the country with regard to the nature of the disease. The sister died.

“ ‘It is singular that in most cases of this kind the disease, in the first instance, has *been* CONFLUENT; so that the extent of the

ulceration of the skin is not the process in nature which affords security to the constitution.”—*Second Treatise*, p. 49.

We may gather some not uninteresting particulars from the above extracts. It would appear that no regard whatever was paid to the state of the virus, or its fitness or unfitness for the purposes of inoculation for security against small-pox. We learn that virus was taken from the nurse-maid on the fifth day of the eruption, and used on two subjects; and that virus evidently *three weeks old* was taken from Master H——, and two subjects inoculated therewith; and all we are told is, that they had mitigated small-pox. So that it is manifest that in the days of inoculation for small-pox no importance was attached to the ripeness of the pustule, or the fitness of the virus made use of. Nor does Dr. Jenner make any allusion to this matter, nor indicate by what law (if they had any) the practitioners of that day were guided. This will be seen by the following

METHOD OF INOCULATING.

“Whether it be yet ascertained by experiment that the quantity of variolous matter inserted into the skin makes any difference with respect to the subsequent mildness or violence of the disease, I know not; but I have the strongest reason for supposing that if either the punctures or incisions be made so deep as to go *through* it, and wound the adipose membrane, that the risk of bringing on a violent disease is greatly increased. I have known an inoculator whose practice was ‘to cut deep enough (to use his own expression) to see a bit of fat,’ and there to lodge the matter. The great number of bad cases, independent of inflammations and abscesses on the arms, and the fatality which attended this practice, was almost inconceivable; and I cannot account for it on any other principle than that of the matter being placed in this situation instead of the skin.”

Other methods equally pernicious being mentioned by Dr. Jenner, he says: “Yet, to repeat my former observation, I cannot account for the uninterrupted success, or nearly so, of one practitioner, and the wretched state of the patients under the care of another, where, in both instances, the general treatment did not differ essentially, without conceiving it to arise from the different modes of inserting the matter for the purpose of producing the disease. *As it is not the identical matter inserted which is absorbed into the constitution, but that which is, by some peculiar process in the animal economy, generated by it, is it not probable that different parts of the human body may prepare or modify the virus differently?*”

“Although the skin, for example, adipose membrane, or

mucous membranes are all capable of producing the variolous virus by the stimulus given by the particles originally deposited upon them, yet I am induced to conceive that each of these parts is capable of producing some variation in the qualities of the matter previous to its affecting the constitution. What else can constitute the difference between the small-pox, when communicated casually, or in what has been termed the natural way, or when brought on artificially through the medium of the skin? After all, are the variolous particles, possessing their true specific and contagious principles, ever taken up and conveyed by the lymphatics unchanged into the blood-vessels? I imagine not. Were this the case, should we not find the blood sufficiently loaded with them in some stages of the small-pox to communicate the disease by inserting it under the cuticle, or by spreading it on the surface of an ulcer?

“Notwithstanding the happy effects of inoculation, with all the improvements which the practice has received since its first introduction into this country, *it not very unfrequently produces deformity of the skin, and sometimes, under the best management, proves fatal.*”

Such, Dr. Jenner says, is not the case with cow-pox.

“It is an excess in the number of pustules which we chiefly dread in small-pox.” Whether a person be inoculated with small-pox or have it naturally, we are, says Jenner, under “a painful solicitude for its consequences,” and it may prove in either case contagious; whilst in cow-pox this is not to be dreaded, as we are fully aware of from half-a-century’s experience.

Again: “In constitutions predisposed to scrofula, how frequently we see the inoculated small-pox rouse into activity that distressful malady!” Not so with cow-pox; for speaking of

SCROFULOUS AFFECTIONS,

Dr. Jenner says: “Every practitioner in medicine, who has extensively inoculated with the small-pox, or has attended many of those who have had the distemper in the natural way, must acknowledge that he has frequently seen scrofulous affections, in some form or another, sometimes rather quickly showing themselves after the recovery of the patients. Conceiving this fact to be admitted, as I presume it must be by all who have carefully attended to the subject, may I not ask whether it does not appear probable that the general introduction of the small-pox into Europe has not been among the most *conducive means in exciting that formidable foe to health?* Having attentively watched the effects of the cow-

pox in this respect, I am happy in being able to declare that this disease does not appear to have the least tendency to produce this destructive malady!"—*Dr. Jenner, Third Treatise, 1800: p. 40.*

Can it be a marvel that any disease, however virulent, contagious, or disgusting, was propagated? The wonder is rather that we have not more hateful ones to contend against.

Adverting to the question of inoculation, Dr. Jenner thus speaks of the way the variolous virus was treated: "One inoculator carrying this virus on lint put into a stoppered bottle, and carried in a warm pocket—a situation certainly favourable for speedily producing putrefaction in it." Patients were thus inoculated, and, from their symptoms and eruptions, Dr. Jenner says, "But what was this disease? Certainly not the small-pox; for the matter having, from putrefaction, lost or suffered a derangement in its specific properties, was no longer capable of producing that malady—those who had been inoculated in this manner being as much subject to the contagion of the small-pox as if they had never been under the influence of this artificial disease; and many unfortunately fell victims to it who thought themselves in perfect security.

"The same unfortunate circumstances of giving a disease supposed to be the small-pox with inefficacious variolous matter have occurred under the direction of some other practitioners within my knowledge, and probably from the same incautious method of securing the variolous matter."

Hence arises the

QUESTION IF INOCULATION OF SMALL-POX PRODUCES TRUE SMALL-POX.

"Is *pure pus*, though contained in a small-pox pustule, ever capable of producing the small-pox perfectly? I suspect it is not. Let us consider that it is always preceded by the limpid fluid, which, in constitutions susceptible of variolous contagion, is always infectious; and though on opening a pustule its contents may appear perfectly purulent, yet a given quantity of the limpid fluid may at the same time be blended with it, though it would be imperceptible to the only test of our senses, the eye. The presence, then, of this fluid may at all times render active what is apparently *pure pus*, while its total absence (as in stale pustules) may be attended with the imperfect effects we have seen."—*Second Treatise, 1799: p. 41.*

We may advantageously consider Dr. Jenner's views of

MORBID GENERATION OF MATTER AND NEW ORGANS.

“It would be digressing too widely to go far into the doctrine of secretion, but as it will not be quite extraneous, I shall just observe that I consider both the pus and the limpid fluid of the pustule as secretions, but that the organs established by nature to perform the office of secreting these fluids may differ essentially in their mechanical structure. What but a difference in the organisation of glandular bodies constitutes the difference in the qualities of the fluids secreted? From some peculiar derangement in the structure, or, in other words, some deviation in the natural action of a gland destined to secrete a mild, innoxious fluid, a poison of the most deadly nature may be created: for example, that gland which in its sound state secretes pure saliva, may, from being thrown into diseased action, produce a poison of the most destructive quality. Nature appears to have no more difficulty in forming minute glands among the vascular parts of the body than she has in forming blood-vessels; and millions of these can be called into existence, when inflammation is excited, in a few hours.”—*Dr. Jenner, Second Treatise, 1799: p. 42.*

Seeing that no certain rule has ever been laid down for the inoculation of subjects for small-pox, with virus that can be relied on to secure freedom from that disease in after-life, and bearing in mind the almost universally received opinion that the human system is more liable to small-pox even after the first attack, or after inoculation, than it was before, I do not feel justified in countenancing the unsatisfactory hazard of such a step. We have seen from a glance at the old practice what evils followed; that a comparatively pure constitution may receive the seeds of a most virulent and loathsome disease, shall remain perpetually contaminated with it, and retain through life the wretched liability to communicate it to others; and that should there be any latent scrofulous taint in the system it becomes immediately roused into action, to be propagated in a thousand ways. We have also learned through the more recent investigations of physiologists that a seed sown in the blood germinates according to laws analogous to those which regulate vegetative products—as is instanced in syphilis. We are not, therefore, justified in planting for one moment a seed which we know from fatal experience to be deleterious to the system, but are rather called upon to obliterate all such products in every possible way. Though Vaccination has accomplished this to an amazing extent, I cannot help thinking that its having done so is due to no

marked improvement upon the great Jenner's discovery—because the ratio of success has borne no comparative increase with that of experience. We are led to infer that the vaccine seed destroys or neutralises some pernicious element in the blood which formerly produced a more hideous and fatal malady, and this in itself is a grand advance towards the entire purification of the human body from unwholesome eruptions. But this is not the only end to be sought, even were it understood, which it is not. There are points of vital importance in the performance of Vaccination which are yet undetermined, unsatisfactory, and unsafe, and it appears to me that they cannot be safely and satisfactorily determined without a previous full and candid consideration of all facts, physiological or other, which can be shown to have a claim for consideration in reference to them.

Let me claim your attention for a few moments in regard to some of these important points. I may run the risk of being misunderstood. Be it so. I would not be afraid of something much worse, were any advantage to the profession likely to accrue from submitting to it.

First.—In determining the proper time for vaccinating a subject, due consideration must be had of the constant state of transition characterising infant life, owing to the rapid processes necessarily ensuing in the bodily system of a child during the first year of its existence. And here the laws of those vital elements dwelling in the newly-discovered structures, the meconic membrane and the rete vasculare, demand a candid and impartial attention. At the time when I made known their discovery it will be seen that I connected their existence with a future regard to this great subject, and deemed it right then to say that no child should be vaccinated until three or four months old. From subsequent reflection and experience I am now prepared to extend that time to nine or even to twelve months as the safest period. Indeed, I have for several years past deferred the performance of Vaccination until about the last-named period, appointing the time of the first teething, or the weaning of the infant when teething has occurred early, as the time for Vaccination. I say nine or even twelve months, because it is impossible to say at what precise age a child may have arrived at that condition of body which, from close observation and experience, I have been led to consider as most appropriate for the reception of the vaccine virus. We see that the maturation of the sexes takes place with some much earlier than with others; and we know also that something analogous to this is observable in children of tender age, in their earlier or later developments of the power of assimilating food, of cutting their teeth, or running alone. What I would impress upon the mind

is, that the proper time for Vaccination is that time within the year when it may be reasonably supposed that, the newly-discovered organisms being disposed of, the transition state of the system is less active—that then and then only is the best period to secure within the blood a virus to oppose that which the system is now becoming tenderly liable to engender within itself, or to receive from others. We should look upon this as a seed sown in opposition to another, which, if it does not wholly destroy, it yet decisively checks, rendering it comparatively harmless by subduing and modifying its force.

Secondly.—The proper time for taking the virus for Vaccination. Dr. Gregory considers the eighth day the best, on the ground that the vesicle is then ripe. But, as I stated in my inquiry, “some vesicles mature sooner than others,” and consequently all are not uniformly ripe on the eighth day. Some writers have insisted on the seventh day as the best; and others, again, prefer the sixth. All may be right in practice, though wrong in insisting upon any particular age of the vesicle, the ripeness of which, and not its age, must constitute its fitness for the purpose. I have myself used virus taken on the sixth day, and I would not have used it a day older from the same subject. The maturation of the vesicle is not an inevitable consequence of its duration of eight or any other number of days, but is contingent more or less upon the constitution and temperament of the subject; therefore I cannot but consider, notwithstanding my respect for Dr. Gregory, that a general eight-day rule is objectionable. The ripeness of the fruit should be the sole law to guide its use. If it be under-ripe no protection is afforded, and if it be over-ripe the worst consequences may ensue. In this latter case purulent matter is mixed with the virus, and the result is, that though vaccine protection be afforded, the germ of morbid action is at the same time implanted in the blood, giving rise to eruptions of various character when the pernicious seed has had time to vegetate in the system. Or it may happen that no vaccine protection is afforded, though a bastard vesicle is produced resembling the true one, and a virulent poison is inserted into the blood, producing papular, pustular, petechial, and other rashes. Hence we find parents setting their faces against Vaccination, complaining, most justly, that until their children were vaccinated no such thing occurred, and inferring, reasonably enough, that but for Vaccination it never would have occurred.

The time for taking virile virus from the vaccine vesicle varies, then, from six to eight times twenty-four hours after Vaccination; and from the sixth to the eighth day, inclusive, we may look for vesicles in a proper stage of maturation. The

vesicle chosen should have no pink surrounding edge ; it should be plump, and the virus should be limpid as rock-water ; for when this appearance ceases the vesicle is enlarged to where the pink edge first showed itself, and resolution of that part ensues, and purulent matter is sure to be present. *The first pink edge which appears surrounding the vesicle is the result of a second destruction of cuticle.* THE FIRST DESTRUCTION OF CUTIS, ORIGINATING THE VESICLE, IS DUE TO THE COMBINATION OF THE VIRUS INSERTED WITH THE ELEMENTS OF THE BLOOD OF THE SUBJECT, AND THIS ALONE SHOULD BE USED ; for after this, organic matter in decomposition is soon mingled with the fluid. This rule appears to me so simple that any one seeing the vesicle must be able at once to pronounce upon its fitness and virility ; and therefore I do not coincide with the declaration, "that nothing but long habit and experience will give to a surgeon perfect and intimate knowledge of the vesicle which should be used for the purpose of propagating the disease." Nor is this opinion very consolatory to the public generally, amongst whom so large a number of the human family are vaccinated by surgeons who have not had "long habit and experience" in this matter. I conceive that a few simply-defined rules, illustrated by actual practice in the course of a very few lectures, would place most observant students in a position, for all practical purposes, equal to that of the most experienced vaccinators of the day. The necessity for some definite rule of practice is, however, apparent from what is constantly taking place ; and it is a great duty of the medical authorities of the present era to render this matter clear and intelligible to all parties, young and old, that all may be competent to perform an act upon which the public safety so much depends.

Thirdly.—With regard to the operation, mode of performing it, and preservation of the virile virus. There can be no question but that the best and safest process is that of inserting the virus fresh from the mature vesicle of one subject to the arm of another. The best mode of doing it is by inserting the point of a sharp lancet *into* the skin, not *through* it, in a slanting direction ; two or three incisions being rapidly made, and then the virus inserted from the vesicle by means of an ivory point.

This is the purest mode of any. As to the preservation of the virus : the ivory points, well charged, set on end to dry, and inclosed in a small stoppered bottle, presents, to my mind, the fittest and safest mode. Virus allowed to dry between two pieces of glass is deteriorated or destroyed by crushing molecular continuity ; and virus carried on the point of a lancet soon decomposes—the steel becoming decomposed and oxygenised by the fluid. This is the most unsafe practice of any, and the

dirtiest. Light, air, warmth and moisture being the agents of degeneration and vegetation, the virus, in order that it may retain its virility, should be kept free from their influence. It would be well, therefore, that the bottle containing the ivory-charged points should be shrouded in some dark envelope, and preserved in a cool and dry place.

There can be no sufficient cause in the present day, either in this or any other civilised country, for the use of old or stale virus. A succession of Vaccinations may be kept up for a given time in the practice of most medical men. Their midwifery notes will point to the proper periods; and, as the course of Vaccination progresses, each practitioner may afford his medical brethren, with whom he ought to be on friendly terms, the opportunity of procuring fresh virus, looking to them for a return of the compliment at a future time—thus being independent of vaccine institutions.

No great discovery ever rushes into sudden popularity and general appreciation. It is not in the nature of the human mind to be other than slow and cautious in the reception of principles opposed to long-established opinions and practices; and it is well that it is so, otherwise we should be still oftener deceived by plausible theories and high-sounding speculations than we are at present. Dr. Jenner recognised this truth; and, like a thorough philosopher, as he was, at once courted and admired the criticism and investigation which his discoveries attracted from all quarters. The manly, disinterested tone of his mind is evident in all his writings, in which nothing is more apparent than the honest sincerity of his conviction, unless it be his anxiety that the usefulness of his labours should be enhanced by new improvements or discoveries as our physiological knowledge advanced.

If the Royal Medical and Chirurgical Society have at its meetings, or through its members, cast any doubt on the perfect efficacy of Vaccination, they at least have it in their power to elicit and to produce a large amount of actual fact to bring to bear upon the solution of that doubt. If that learned Society would declare themselves ready to receive information from any member of the profession, bearing on the subject, and would, when received, subject it to careful analysis, with a view to the collection of fact alone, they would ere long, there is little doubt, be in possession of sufficient data to banish for ever all uncertainty.

With regard to the character of the facts proposed to be collected, I make, with submission, the following few suggestions. Correspondents should be requested to transmit—

First.—Cases of recurrence of small-pox after Vaccination,

with the most accurate particulars as to the age of the subject when Vaccination was performed; cases unaccompanied with such particulars being of no importance.

Secondly.—Cases of the occurrence of small-pox, under whatever circumstances, in children under a year old, specifying their exact age. [I have for a long time doubted the liability of infants to imbibe the small-pox miasma, or to generate the disease within themselves while at the breast, or at any time before cutting their eight incisors and four bicuspidati, unless under extraordinary circumstances, such as exposure to filthy exhalations and effluvia, or contact with dirty, diseased parents. I have never met with the case of an infant affected with small-pox when not vaccinated, where ordinary care and cleanliness were observed; though I have looked for such cases diligently since the discovery of the new structures above mentioned. The fact that infants are born with small-pox at the time when the parents are suffering under that disease has no bearing on the question.]

Thirdly.—Cases where rashes or eruptions of any kind have occurred after Vaccination, with such particulars as can be ascertained relative to the age and appearance of the virus employed.

Fourthly.—What rules or criteria practitioners have followed in reference to the choice of the vesicle made use of to propagate the disease.

Lastly.—That any information upon these or any analogous topics which gentlemen may be enabled to contribute be received and collated; and that the Registrar-General be solicited to co-operate. From the mass of valuable matter which might be thus collected, the Society might, between the closing of the present and the opening of their next session, bring a useful amount of physiological and statistical information to bear on the subject.

In connexion with the observations in the preceding paragraphs I may be allowed to close with a remark from Dr. Jenner's Third Treatise, p. 41.

“The scepticism that appeared even among the most enlightened of medical men, when my sentiments on the important subject of the cow-pox were first promulgated, was highly laudable. To have admitted the truth of a doctrine at once so novel and so unlike anything that ever had appeared in the annals of medicine, without the test of the most rigid scrutiny, would have bordered upon temerity; but now, when that scrutiny has taken place, not only among ourselves but in the first professional circles in Europe, and when it has been uniformly found in such abundant instances that the human frame, when once it has felt the influence of the genuine cow-pox in the way that has been

described, is never afterwards at any period of its existence assailable by the small-pox, may I not with perfect confidence congratulate my country and society at large on their beholding, in the mild form of the cow-pox, an antidote that is capable of extirpating from the earth a disease which is every hour devouring its victims—a disease that has ever been considered as the severest scourge of the human race?”

THE END.

PHYSIOLOGY
OF THE
UTERUS, PLACENTA, AND FŒTUS;
WITH OBSERVATIONS ON THE
MEMBRANA MECONII AND RETE VASCULARE,
NEWLY-DISCOVERED STRUCTURES EXISTING IN THE
FŒTUS AND YOUNG OF MAN AND ANIMALS.

BY
BENJAMIN RIDGE, M.D., M.R.C.S.E., &c.; PUTNEY.

"With much pleasure we hail the appearance of books which bear the stamp of ORIGINALITY, the abundance of mere compilations that issue from the Press giving us all the greater relish for works which advance science by new observations and researches, and, in a medical point of view, shine by the light of the study, instead of the lamp of libraries. The present volume belongs to the former class, and possesses sufficient claims to induce microscopic physiologists to examine its details with attention.

"In the fourth and fifth sections we arrive at a knowledge of the chief purpose of the work, which there gives a description and an account of the probable uses of newly-discovered structures, the *membrana meconii* and the *rete vasculare*. . . . These organised structures having become useless, are discharged at and after the birth of the infant—a phenomenon so unexpected as to excite our utmost admiration at Nature's process.

"With a few exceptions, not influencing in any great degree the value of the work, we confidently recommend its contents to the best consideration of the profession, fully persuaded that, as a further step in scientific knowledge, it deserves appreciation, as an addition to the existing facts and theories of medical science."—*Lancet*, vol. 1, 1845: p. 210.

JOHN CHURCHILL, PRINCE'S-STREET, SOHO. 1845.

GLOSSOLOGY,
OR THE
ADDITIONAL MEANS OF DIAGNOSIS OF DISEASE
TO BE
DERIVED FROM INDICATIONS AND APPEARANCES OF
THE TONGUE.

A Paper read before the Senior Physical Society of Guy's Hospital, 4th Nov. 1843,

BY BENJAMIN RIDGE, M.D., M.R.C.S.E.

"The advantages of the author's opinions upon the use of studying the appearances of the tongue, under certain guidance, are superior to any we hitherto enjoy, because they not only afford us a correct view of the system in general, but they put us 'above our patient,' and enable us to detect any attempt at concealment or misrepresentation."—*The Lancet*.

"Dr. Benjamin Ridge's observations will doubtless prompt to a more attentive study of the diagnostic value of the tongue (a study which cannot but prove of great service), and are characterised by a disinterested earnestness of purpose, an ability and spirit of scientific research, which command the critic's respect, even when the author fails to win his assent."—*The Medical Times*.

"This book is well worthy the careful attention of the medical profession. Every practising member of that profession has the power of investigating the truth of these doctrines, and it is a duty he owes to himself, to his profession, and to his fellow-creatures to do so; for the nearer the approach to certainty in diagnosis, the nearer the approach to certainty in the application of remedial agents."—*The Sun*.

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