The historian further adds, "At non tantum Ægyptum hujusmodi adeo immani clade contigit exagitari, verum et aliæ orbis regiones aliis diversis atque atrocioribus affectæ sunt malis." And again, "Nam et pestilentia (speaking of the same year) tanta extiterat vel Romæ, vel in Achaicis urbibus, ut uno die quinque millia hominum pari morbo perirent."*

On the authority of Eusebius, we have the following account of a pestilence attended with eruptions and other symptoms strongly indicative of small-pox.

It occurred in the 6th year of the Emperor Maximinus, and A. D. 311, and is thus described. "Pestis deinceps oberrare cœpit; morbi etiam cujusdam novi et peregrini (exulceratio quædam, quæ æstus et fervoris proprio nomine anthrax, id est

criminate between the pestilence, strictly so called, and those pestilential epidemics, combined with eruption, of which so many instances have been recorded. There can, therefore, be little doubt that under the head of *pestis* and *pestilentia* both affections have been often confounded; and that the symptoms which are peculiar to each are frequently omitted. In the general argument, then, I am not disposed to lay any stress on those pestilences where eruptions are not mentioned by the historian. When such examples are brought forward, it is chiefly to pseserve the continuity of the narrative. They cannot, however, be entirely rejected, inasmuch as symptoms omitted by one writer, are stated by another as occurring in the same Epidemic. This remark especially applies to eruptions.

* Euseb. Ecclesiast. Hist. Lib. vii. cap. xxii.
Baronii Annales Ecclesiastic. Vol. 2. page 582-3.

carbunculus, appellatur) gravis et violenta impressio, qui per universum corpus pererrans, mortifera his qui eo perturbabantur, injecit pericula. Quinetiam quoniam in oculis potissimum ejus insidebat cruciatus, infinitos ferè viros cum conjugibus et liberos cæcos reddidit." It is quite evident that the anthraces, or carbuncles, here spoken of, could not be those which denote the true plague, as in that disease they are always local; and besides, the eyes are seldom or never injured.*

This epidemic continued, or revived, during the subsequent year (A. D. 312), attended with famine: of the effects of both Eusebius has drawn a most appalling representation. He thus expresses himself respecting the disease: "Pestis autem omnes domos integras et familias penitus depascebatur, et eos vel maximè, quas fames propter alimentorum

* The description of this epidemic, or, to speak more correctly, of an eruptive disease, which accompanied it, is, in the Greek, so strongly indicative of variola, that I am induced to quote it: Λιμός δ' ἀδόκητος επισκήπτει, καὶ λοιμὸς επι τούτῳ· καί τινος ἑτέρου νοσημάτος, ἕλκος δὲ ἦν φερωνύμως τους πυρώδους ενεκεν, ανθραξ προσαγορευόμενον, επιφορὰ· ὃ καθ' ὅλων μὲν ἕρπων των σωμάτων σφαλερους ενεποίει τοῖς πεπονθόσι κινδύνους. ἐ μὴν αλλα καὶ καῖα των οφθαλμων διαφερόντως επιπλεῖστον γινόμενον, μυρίους ὅσους ἄνδρας ἅμα γυναιξὶ καὶ παισὶ, πηρους απειργάζετο.

Now, if we take this as a true account of the symptoms of the *certain other* disease above-mentioned, I would simply ask what disease, other than small-pox, *that* could have been, which, attended with the pustular eruption over the whole body, and fixing itself about the eyes, rendered thousands (μυρίους) of men, women, and children blind?

Consult Euseb. Hist. Ecclesias. Lib. ix. cap. viii.

affluentiam quâ fruebantur, consumere et conficere non poterat;" and goes on to say, that the magistrates and prefects, and many others who, having power and authority, possessed a superabundance of every thing, as if the famine had designedly spared them that they might perish by the pestilence, underwent a very severe, and, for the most part, a hurried death. In this way whole families were cut off very rapidly; so that two or three bodies of the dead were carried out from one house for burial at the same time. All places, therefore, by-ways, markets, streets, overflowed with tears, sorrow, and wailings; nor could aught be witnessed save the most piteous lamentations and weeping. During the prevalence of this pestilential epidemic, the conduct of the Christians was worthy of their high vocation, forming a strong contrast with the demeanour of their heathen countrymen.

Eusebius thus simply but strikingly pourtrays it:—"Quo quidem tempore clara singularis Christianorum erga quemque et studii et pii animi indicia apud omnes increbuerint. Nam hi solum in tanto malorum cumulo suis rectè factis, et piis officiis misericordiam declarabant et benignitatem: quorum alii indies singulos mortuorum funeribus et sepulturæ (infiniti enim erant, quibus sepeliendis nemo curam adhibuit) diligentem navarunt operam: alii, multitudine eorum qui per totam civitatem fame urgebantur in unum coacta, omnibus panes dispertierunt: usque

adeo ut hoc præclarum facinus per omnes homines constanti famâ et magna celebritate pervaderet; et singuli Christianorum Deum gloria et laude prædicarent, eosque solos et veros Dei cultores re et factis comprobatos faterentur."

A. D. 376 and 13 of the Emperor Valens, Baronius, on the authority of St. Ambrose and Paulinus Nolanus, states that a pestilence raged throughout Europe, attacking both man and beast: "Lues pariter boum atque hominum, cæterique pecoris: ut etiam nos, qui bellum non pertulimus, debellatis tamen pares fecerit pestilentia." Ambrosius comment. in Luc. lib. 9. cap. 21.

In the year 410 of the Christian era, famine and pestilence prevailed at Rome to so great an extent, that, as Zosimus (according to the version of Baronius) expresses it, "Omnia plena cadaveribus erant. Cumque non possent extra urbem sepeliri cadavera quod omnem exitum hostes observarent, urbs ipsa mortuorum sepulchrum erat." Zosimus, lib. 5.

A plague (pestis ingens) raged at Rome A.D. 467. but no particular account is handed down to us either of symptoms or mortality. Pope Gelasius, in a letter to Andronicus, says, "pestilentia tanta subrepsit ut toleranda vix fuerit." Vide Baron. vol. 6. p. 281.

In the reign of Zeno (A. D. 484.) pestilence and famine ravaged all the cities of Africa. Id. p. 427.

Famine and plague distressed Italy in the 13th year of Justinian (A. D. 539.); the pestilence, however, seems to have been the result of scarcity. The

symptoms mentioned are those of inanition and emaciation—not of plague. *

Procopius relates that, in the 18th year of Justinian's reign (A. D. 544.) a great plague began to rage in the East, for which no remedy was found, except from God, from whom it proceeded, although (he says) "many arrogant persons vied with each other in commenting on the causes of (its) physiology, all of which were vain and inexplicable, and only deceiving with idle words, for this disease spared neither age, nor sex, nor place; but whence it had its beginning, and in what manner it destroyed its victims, I will relate. It began in Egypt, at Pelusium; hence it took in the whole world, continually advancing; it left no lurking-places, nor did it attack the same persons a second time."

Evagrius records the same pestilence described by Procopius in his "Persic war;" but he has added many circumstances, either passed over by Procopius, or differing from his account. This, however, is easily explained, for Evagrius did not commit his recital to writing till fifty years after the first appearance of the epidemic (A. D. 544) to which time the narrative of Procopius applies: since he states that the disease prevailed in Constantinople for only three months, and that in the beginning of it a few died; but at length, five thousand, and, still oftener, ten thousand were hurried off by it daily; so that many, even of the

* Procopius de Bello Gothico, Lib. 2.

wealthy class, their attendants and servants having already fallen victims, perished rather from want of persons to take care of them than by disease; and, for the same cause, remained unburied.

Evagrius assures us that this pestilence raged amongst mankind during fifty-two years, nor were its ravages confined to the East alone but extended throughout the world; it depopulated some cities entirely and often returned to the very same places it had before invaded; and assumed many symptoms different from those which had marked its early progress.

It began to prevail about two years after the capture of Antioch by the Persians under Chosröes, (A. D. 542) in some respects resembling the plague at Athens described by Thucydides, in other respects differing from that. It was, by common report, said to have originated in Ethiopia, and thence diffused itself over the world attacking different places successively, and sparing none of human kind.

Evagrius says that at the moment of writing his account of the disease, it had invaded Antioch for the fourth time; in this attack it deprived him of a child and grand-child; he himself having undergone the distemper on its first appearance, fifty-two years before.

In the year of Christ 558, the 32d of the Emperor Justinian, this fatal pestilence again attacked Constantinople, of which Agathias, as reported by Baronius, thus expresses himself, "Eodem anno, vere jam ineunte, derepentè et iteratò urbem pestilens

morbus invasit et infinitam sustulit multitudinem: haud tamen prorsus cessavit ex quo tunc primùm anno Justiniani Imperii quinto irrepere hanc nostram regionem occepit." *

On this occasion Justinian thought fit to issue his imperial edict of advice to the people of Constantinople, calling on them to depart from the iniquity of their ways, and to invoke the pardon of the Almighty. After having pointed out to them various crimes of which they had been guilty the edict concludes thus against the obstinate offender, "Primùm quidem obligatus erit judicio Dei, post hæc et nostram indignationem sustinebit."

To point out to my reader the difference between many of those epidemics which have been adduced, and the ordinary plague, I shall here trespass somewhat longer on his indulgence by bringing forward a brief account of *that* disease as it appeared in Italy in the last year of Justinian, A. D. 565; and therefore contemporaneous in its visitation with the more general and dreadful pestilence just noticed as prevailing epidemically in one part or other of the empire during his whole reign. It will show also that the prominent symptoms of the bubonic plague were well known to historians; so far at least as not to be confounded with those which marked many of the other pestilential epidemics, identified as these are, in my judgment, with small-pox.

* Agathias, lib. 5.

Paulus Diaconus* thus describes the Pestis inguinaria:—

"In these same times (A. D. 565) a very great pestilence arose in the province of Liguria. For there suddenly appeared certain signs (quædam signicula,) through the houses, on the doors, vessels, clothes, which, on any attempts to wash them out, became the more apparent. But, after the completion of the year, little glands (glandulæ) like a nut or date began to grow in men's groins and other more delicate places; these swellings were immediately succeeded by an intolerable heat of fever; so that the sufferer was carried off on the third day. Yet if any one got over the third day he had hopes of living."

Paulus says nothing farther respecting the symptoms of this disease, but those he *has* mentioned are fully characteristic of true plague, and distinguish it clearly from an eruptive fever. His detail of its natural and moral effects is eloquently piteous and impressive.

The historic sketch of pestilential eruptive fevers has brought us to that era to which the first appearance of small-pox has been usually assigned, namely, A. D. 568 or 569 during the siege of Mecca by the Abyssinian army under Abrahah the viceroy—and his sudden retreat from Arabia is attributed to the breaking out of small-pox among his troops. This

* See Paul. Diac. de gest. Longobard. lib. 1. cap. 4.

event is ascribed, in the language of fable, to an assault of pebble-stones thrown from the beaks and talons of great birds on the Abyssinian army; but there is no necessity to have recourse even to figurative expression; since nothing can be more probable than that the pestilence, which continued through Justinian's time, met the Abyssinians at Mecca. In this view of the subject it is quite as probable that the Abyssinians were infected by the Arabians as the Arabians by them; nor is it at all improbable that both might have had the disease in their ranks. Bruce relates that at Masuah on the confines of Abyssinia he met with a MS. account of the war of the Elephant, in which the native author told nearly the same tale as the Arabian writers on the subject, adding, that at that time the small-pox was first observed in Arabia.

From the time of the cessation of the great and long-continued pestilence during the reign of Justinian, which in its course depopulated many cities and districts of the empire and extended its ravages through Europe, Asia, and Africa destroying in its course two millions of the human race, the accounts transmitted to us, from the dark ages, of pestilential diseases are so obscured by monkish fables and miracles that the frequent recurrence and dreadful mortality of these epidemics are almost the only facts of which we can be certain; the attendant symptoms are scarcely ever stated; the consequences are sometimes alluded to, as for instance, disfiguration of

the person, and loss of limbs occasionally; but most frequently *blindness;* inasmuch as restoration of sight lost, during the pestilence, is often recorded as the miraculous effect of saintly interposition. From this period too (the close of the 6th century) historians began to designate the genuine plague by the name of Pestis Inguinaria, or Lues Bubonum; so that by this appellation a more accurate distinction than had previously obtained was drawn between true plague and other pestilential epidemics. Yet even after the time that the Arabian physicians began to treat *expressly*, and by name, of the variolous eruption, their descriptions are not very accurate, nor their histories satisfactory. Of this any one may satisfy himself by consulting Rhazes, as published by Mead in his 1st vol. Paris, 1757, edit.

If such then be the inaccuracy of the older medical writers professedly treating of a specific disease what ground have we to expect that historians and chroniclers shall be more precise in their descriptions of wide-spread epidemics.

Moore in his history of small-pox, though he combats the antiquity of that disease in Europe, makes a very just observation respecting the alleged silence of historians on the subject of its appearance. " The small-pox being included in the term pestilence explains satisfactorily why it is not named by the older writers; and also accounts for the very frequent occurrence of the plague in early times. In the old chronicles the plague is recorded to have visited

France eleven times in the 9th, and six or seven times in the 10th century. Some of these visitations were unquestionably the small-pox and measles. The pestilence of *fire*, of which horrible descriptions are given, may have been in some instances the small-pox." Of the justness and truth of these remarks I have no doubt; even as applied to a period later than the 10th century. Thus, as an instance, I shall transiently adduce one from Baronius who, in speaking of St. Martial's miraculous powers, attributes to them the stopping of a pestilence even after he was laid in his grave. Baronius relates it on the authority of a writer of the history of Aquitaine of which some fragments only remain: his words run thus: "His diebus (A. D. 1029) *lues gravissima* Semovicinos devoravit, *incendens* corpora et *exardescendo* devorans."—Now, however we may reasonably deny the miracle, we have no reason to question the reality of the pestilential epidemic; or the accuracy of the historian with reference to its general and more obvious character which certainly assimilates it rather with an ardent eruptive fever, such as small pox, than with true plague or lues inguinaria, a name ordinarily given, then and for ages preceding, to the bubonic pestis.

Accounts of pestilential fevers still more strongly marked in their resemblance to small-pox, and in *their essential difference* from plague, occur so frequently in the Ecclesiastical Annalists as to weary the reader. But this branch of the subject

has been so amply treated of by Dr. Willan, and his references are so numerous, that I think it unnecessary to go into it more at large.* Enough, I believe, has been already said to draw attention to this very interesting topic.

Having brought down the history of eruptive pestilential diseases, as they affected both man and the inferior animals, to that period in which small-pox is on all hands admitted to have been recognized I am now to prove by the direct testimony of those who have written expressly on the diseases of cattle, that an epidemic small-pox, described under that specific name, has been often known to have raged amongst them.

Lancisi, in his treatise *De Bovilla peste*, par. iii. p. 142, asserts that the disease among the horned cattle which he describes, and which was epidemic in the papal territory in 1713-14, was similar to that which had occurred in Italy, nearly two centuries before (1514) and of which Fracastorius thus writes in Lib. I. de Contagione, cap. 12. "Referemus etiam insolitam anni 1514 contagionem, quæ in boves solùm irrepsit. Visa primo circa Foro-juliensem tractum, mox sensim, et ad Euganeos delata, atque indè in agrum nostrum. Abstinebat primò bos à cibo sine causa ulla manifesta; spectantibus autem in ora eorum bubulcis, asperitas quædam et parvæ pustulæ percipiebantur in palato et ore toto. Separare protinus infectum oportebat à reliquo ar-

* See Willan on the Atiquity of Small-pox.

mento, alioquin totum inficiebat. Paulatim labes illa descendebat in armos, et indè ad pedes; ac quibus ea permutatio fiebat, sanabantur ferè omnes; quibus autem non fiebat, plurima pars peribat."

Lancisi, after referring to the above passage in Fracastorius, says, "It is, therefore, evident that this kind of pestilence was by no means unknown to our ancestors. The name which they gave it I shall now examine into, as I think even this not foreign to our purpose: for, though it be true that names are imposed not by any authority of nature but at men's pleasure, still such investigations should, by no means, be neglected." He then proceeds: "*Malis* igitur, ut a Gesnero et Aldrovando accepimus, armentorum ægrotatio illa vocatur, quæ cibi fastidio et cessante ruminatione se prodit. Duplex est apud illos *Malidis* genus, siccum et humidum. Illud narium atque oris ariditas consequuntur. Istud mucus et fluens ex ore pituita. *Quatuor* Græci assignant commemorantque *Malidum* species. (μάλις enim aut μαλίη Græcorum vox est;) ὑγρὰν primam vocant, scilicet humidam; ξηρὰν alteram, seu siccam; tertiam ἀρθρῖτιν, articularem videlicet; quartam denique ὑποδερματῖτίν, hoc est subcutaneum. Quatuor istas non casu, sed datâ operâ, recensui. Certum quippe mihi est eas omnes, si ab articulari discedas, in hujus temporis contagione se immiscere. Nam ut nihil de sicca humidaque dicam, quæ in dubium revocari nequeunt, cur subcutaneum excludamus? Nonne illam in omnium oculis ponunt et tabe ad cutem depositâ

depilatæ, et horror pilorum, et armorum, cluniumque tremor, maculis denique et pustulis infecta cutis? Adeo ut quibusdam in mentem venerit cogitare boves non lue, ut nunc res est, sed *ipsis pustulis*, quas *variolas* vocant, interire."

Bernardinus Ramazzini, in his Constitut. Epidem. for the year 1690, after having entered at large into the subject so far as it respected the diseases of man, proceeds thus:—"Vim hujus male moratæ constitutionis experta quoque sunt cujuscunque generis Animalia, quæ in magno numero interiere; sicut autem in ea, quam describit Silius Italicus, quæ sicca fuit et præfervida vim primi sensere canes, ut in hac frigida et præhumida, prima clades pecudum fuit, quibus postquam per dies aliquot ægrotassent, veluti per crisim apparebant *variolæ* in capite et collo, ac plerumque ab iisdem excæcabantur, sic quæ ex vehementia morbi non perierant, tandem ex inedia contabescebant. Sues quoque turmatim suffocati moriebantur." To this account he farther adds, "Tubercula autem illa quæ in capite, collo, et cruribus pecudum visebantur, revera *variolas* fuisse licet profecto asserere, quando nec figura, nec colore, nec liquore in illis contento, nec magnitudine, nec modo quo solvebantur post suppurationem, nigra crusta superstite, quicquam a puerorum variolis discrepabant."

This description of symptoms may be the more strongly relied on, inasmuch as Ramazzini merely narrates what he witnessed then, and at a subse-

quent period in 1711. Of the year 1691 he observes, "Haud secus quam anno elapso magna fuit animalium strages, ac pecudum præcipuè, ita ut ovillus grex totus penè deletus fuerit."

I have already observed that the statements of this physician are the more to be relied on because he had no favourite theory to support by them, nay he was even adverse to a prevailing opinion of his Italian brethren that the diseases of cattle were communicable to men; yet with the integrity which should always scrupulously attend the medical historian he adds, at the close of his dissertation on the Epidemic Constitution of the year 1691, these remarkable words:—At profecto gravis hæc morborum tempestas omnino desiisset, ni Variolæ, quo magis ambientis calor tepescebat, eò ferocius sæviissent, cum non solum puellarem ætatem demeterent, sed etiam grandævos, ac præcipuè utero gerentes, quotquot hoc morbo laborarent. De Variolarum natura et causis, cum tot extant doctissimorum hominum scripta, nil addam nisi quod in hac Variolosa Constitutione, quæ circa autumni finem vim suam magis exercuit, facilius evaserint ii quibus nec detractus fuit sanguis, nec ullum administratum remedium, toto curationis negotio naturæ commisso." But it was in the course of the year 1711 that the destructive pestilence, since called Lues Bovilla, raged in Italy, and which Ramazzini has so strongly and so feelingly delineated. His introductory expressions would lose so much by translation that I

shall present them to my reader in their original form. "Nemo non novit quam inopinatè, quam violenter Bubulum genus dira contagio pervaserit flammæ ad instar, quæ ope nulla humana consopiri, nedum restingui potuerit. Hæc primum quidem in Vicentino agro subobscure observari cœpit; mox in Patavinum transgressa apertè se prodidit, ac longè latèque effusa, usque ad ipsa urbis pomœria, tam magnam ac horrendam böum stragem edidit, ut tum rura tum civitatem mœrore ac metu complerit. Mœret rusticana plebs, imo attonita stupet dum amplа bovilia vacua ac deserta intuetur."

His detail of symptoms is also very forcible and clear. "The kind of affection which seemed to have declared exterminating war on the whole race of oxen was evidently a malignant, destructive, and (if you will) a pestilential fever commencing with chills, rigor, horripilatio, succeeded quickly by pungent, violent heat diffused over the whole body, with frequency of pulse, and accompanied by great anxiety and heavy panting, together with stertor, and, in the commencement of the fever, with stupor and a kind of lethargy; a continual flow of stinking matter from the mouth and nostrils; a most fœtid discharge from the bowels, and this at times bloody; loss of appetite and rumination was altogether destroyed; on the fifth, or sixth day pustules broke out over the whole body of the animal, and tubercles resembling *variolæ* in kind and appearance; death common to all, and in the same manner, about the

fifth or seventh day; very few escaped, and these rather by chance than the efficacy of any remedies."

Our author then proceeds to inquire into the epidemic constitution of the air and season, and fully acquits them of having either caused, or contributed to the production of the disease: he says, "Aërem itaque et pascua ab hoc crimine, quòd hujus morbi in causa fuerint, absolvere fas erit." He goes on to state that "it now is sufficiently certain, and is related in *the public acts*, that from the crowds of oxen which the traders are in the habit of bringing from Dalmatia and the neighbouring countries, a single ox separated from the rest, and being found by a herdsman, and brought to the pastures of Count Trajan Borromeo, '*pro hospitio, eadem labe qua erat infectus hospites suos fœdavit;*' for having died a few days afterwards, by degrees the whole herd miserably perished by the same disease, one ox only excepted, in the neck of which a seton had been inserted. The same contagion, therefore, creeping by degrees in a short time has pervaded the whole extent of the territory of Padua; and then, at length having crossed the Po, threatens the same destruction to the inhabitants of Æmilia."

Ramazzini having thus established the fact of the importation of this eruptive plague among the herds of Lombardy proceeds to account for its wide-spread dissemination by means of its highly contagious nature. His words are "Quoniam autem morbosi

seminii ea est indoles, ut facile sobolescat et in immensum se propaget, si in subjectum proprium incidat, non est quod miremur si hæc contagio tam longè latèque sese effuderit." He then touches on the opinion entertained, even at the time, that this distemper might, in some shape or other, be propagated to man. "Num autem hic epidemicus bovini populi morbus humanis corporibus labem aliquam affricare valeat, *ut nonnulli suspicantur*, non alienum est disquirere." After having discussed some very interesting and curious arguments on each side of this question, supported by historical facts, he concludes *against* the probability of the disease attacking the human subject, and sums up the evidence on his own side with this expression, "habemus igitur unde spes nostras alamus." Nevertheless he prudently recommends a strict attention to such measures as were in his opinion calculated not only to prevent the infection from acting on man, but to check its operation on the untainted cattle, very judiciously remarking—"Ubi enim de morbo contagioso agitur nunquam satis cavemus, dum cavemus."

With respect to the means to be employed in the case of the diseased cattle themselves, he treats more at large: his general plan, however, he expresses in a few words—"Crediderim itaque in curatione hujus malignæ febris ea methodo procedendum quæ a bonis medicis servatur in curanda Variolosa puerorum febre." By this short sentence, Ramazzini strongly

evinces his opinion of the nature of this bovine pestilence.

It is worthy of observation, that the medical writers who saw and described the Variolæ among cattle, especially Lancisi and Ramazzini, have referred to the Latin poets for illustrations of the disease. Such authority is sufficient to justify any writer of the present day in making use of the language of Virgil, of Ovid, of Lucretius, or of Seneca, to elucidate any statement that he may have advanced. Before producing the quotations themselves, I would beg the reader to remark that as modern physicians have recognised in the delineations of the poet a real disease which they themselves witnessed, so in like manner the poets assimilate the disease which they paint to that left us by Thucydides, and refer to Egypt as its source,

"Nam penitus veniens Ægypti è finibus ortus."

Such coincidences are too striking not to arrest attention; in the general argument they can not and ought not to be overlooked; and they go not a little way to strengthen and to confirm the positions we have taken respecting the origin and progress of Variolæ.

Virgil, after a most pathetic description of an epidemic distemper which destroyed the domesticated animals, among which he enumerates oxen, horses, dogs, swine, and sheep, concludes thus:—

" Jamque catervatim dat stragem, atque aggerat ipsis
In stabulis turpi dilapsa cadavera tabo:
Donec humo tegere, ac foveis abscondere discunt.
Nam neque erat coriis usus: nec viscera quisquam
Aut undis abolere potest, aut vincere flamma:
Nec tondere quidem morbo illuvieque peresa
Vellera, nec telas possunt attingere putres.
Verum etiam invisos si quis tentaret amictus;
Ardentes papulæ, atque inmundus olentia sudor
Membra sequebatur. Nec longo deinde moranti
Tempore contactos artus sacer ignis edebat." *

Ovid is equally strong in his expressions, though not so minute in his description of symptoms.

" Strage canum primâ, volucrumque, oviumque, boumque,
Inque feris subiti deprensa potentia morbi.
Concidere infelix validos miratur arator
Inter opus tauros; medioque recumbere sulco.
Lanigeris gregibus, balatus dantibus ægros,
Sponte suâ lanæque cadunt, et corpora tabent.
Acer equus quondam, magnæ que in pulvere famæ,
Degenerat palmas, veterumque oblitus honorum,
Ad præsepe gemit, letho moriturus inerti."

" Omnia languor habet, silvisque, agrisque, viisque
Corpora fœda jacent: vitiantur odoribus auræ."

" Pervenit ad miseros damno graviore colonos
Pestis, et in magnæ dominatur mœnibus urbis." †

* Vide Georgic. lib. III. sub fin. † Metam. lib. VII.

Ovid proceeds to depict the ravages of this malady when it affected men, almost in the very words that Thucydides has employed in his account of the Athenian pestilence. But this historian is, as it were, imitated or paraphrased still more closely in Lucretius' sixth book "De Rerum Natura."

"Nunc, ratio quæ sit morbis, aut unde repentè
Mortiferam possit cladem conflare coorta
Morbida vis hominum generi, pecudumque catervis,
Expediam."

I shall not follow the poet through the whole of his animated and accurate detail; but select such prominent symptoms as tend most impressively to characterize the disease.

"Principio, caput incensum fervore gerebant,
Et dupliceis oculos suffusâ luce rubentes.
Sudabant etiam fauces intrinsecus atro
Sanguine, et ulceribus vocis via septa coibat,
Atque animi interpres manabat lingua cruore,
Debilitata malis, motu gravis, aspera tactu:"

"Nec nimio cuiquam posses ardore tueri
Corporis in summo summam fervescere partem:
Sed potiùs tepidum manibus proponere tactum,
Et simul ulceribus quasi inustis omne rubere
Corpus, ut est, per membra sacer cùm diditur ignis."

"Quorum siquis, ut est, vitârat funera lethi
Ulceribus tetris, et nigra proluvie alvi;
Posterius tamen hunc tabes lethumque manebat.

Aut etiam multus capitis cum sæpe dolore
Conruptus sanguis plenis ex naribus ibat."

"Horrida pædore, et pannis cooperta, perire
Corporis inluvie: pellis super ossibus una,
Ulceribus tetris prope jam sordique sepulta.
Omnia denique sancta Deûm delubra replêrat
Corporibus mors exanimis, oneratáque passim
Cuncta cadaveribus cœlestûm templa manebant,
Hospitibus loca quæ complêrant ædituentes."

Seneca, the philosopher and poet, enlarging on the circumstances of the λοιμὸς that ravaged Thebes in Bœotia, during the reign of Creon, as described by Sophocles in his 'Œdipus Tyrannus,' thus depicts the symptoms of the disease:

"O dira novi facies leti!
Gravior leto!—Piger ignavos
Alligat artus languor, et ægro
Rubor in vultu, maculæque caput
Sparsere leves; tum vapor ipsam
Corporis arcem flammeus urit
Multoque genas sanguine tendit,
Oculique rigent, et sacer ignis
Pascitur artus. Resonant aures
Stillatque niger naris aduncæ
Cruor, et venas rumpit hiantes.
Intima creber viscera quassat
Gemitus stridens."

On referring to Goëlicke's dissertation "De Lue Contagiosa Bovillum genus nunc depopulante," (1730), we find the more common symptoms described very much as they had already been pourtrayed

by former writers, such as Lancisi, Lanzoni, Ramazzini, and others. From this close resemblance, he draws the necessary inference that the distemper was one and the same throughout the various regions it visited: he thus expresses himself on this topic:—"Ne quis vero existimet luem nostra inter pecora hodie grassantem alterius forte indolis esse quam quæ bovilia et armenta aliarum regionum devastavit, agedum, excutiamus tantum principes, quæ morbum istum comitatæ sunt, circumstantias, atque observatis per extispicia factis comparemus, morbumque per omnia sibi similem esse constabit." He then subjoins to his enumeration of the more ordinary appearances, "Observarunt nonnulli linguam admodum inflammatam, in cujus etiam superficie copiosas aphthas conspexerunt. Quædam istorum pecorum ophthalmia laborarunt. In quibusdam circa ambitum intestini recti ecthymata, carbunculos vel petechias representantia, in aliis vero vibices esse detectas. In aliis toto corpore *pustulæ* emicuere, quibus ruptis ichor tenax et sanguinolentus effluxit." Corresponding with this last symptom, is a remarkable passage in Lanzoni's detail: "In aliquibus pustulas sub cute effloruisse adeo ut nonnulli crediderint *variolis* boves esse adfectos." Goëlicke, as well as all the authors whom I have consulted, mentions two other circumstances worth noting; namely, "the disease attacked plump, healthy, and strong cattle, in preference to those that were lean and weakly; which latter, when affected, were more likely to

survive:" and "quamplurimæ vaccæ gravidæ abortivere."

That this virulent and deadly disease was propagated by contagion or infection there can be no doubt: and indeed even those writers who have been disposed to ascribe its origin to "local causes," or to an "epidemic constitution of the atmosphere," do nevertheless admit its dissemination by contact or proximity.* Goëlicke, in his proëmium, on the authority of a German physician, John Kanoldus, (whose work I have not been able to obtain) derives the origin of the "Lues contagiosa," of which he treats, "from the confines of Tartary, through Muscovy into Poland, and thence partly towards the North, and partly to the South, this dire pestilence spread itself by degrees, and in that course into Livonia, Curonia, Prussia, Pomerania, Holstein, Holland, and thence to England itself; from England, partly into the Turkish empire, Hungary, Sclavonia, Croatia, and thence into Austria, Moravia, Stiria, Carinthia, Carniola, Bavaria, &c. &c.: it partly penetrated into Italy, and moreover into France, and even Spain, and thence at length again into Germany."

It may here be worth while to give Sauvages' character of this disease. He places it in the genus Dysenteria; though this flux of the bowels is evi-

* Goëlicke remarks, in common with many others, that the cattle who were once affected, and recovered, never again, "nisi rarissimis exemplis," were subjected to the same disease.

dently only symptomatic; and, at times, altogether absent.

"9. *Dysenteria pecorum. Malis humida, Lancisii de peste bovilla. Pestis bovilla, Ramazzini. Lues vaccarum Tubingensis.*

"Morbus hic totam successive Europam, et demum nuper Galliam devastavit, atque boves eripuit. Hunc observavi apud Helvios, Comitiorum jussui ut obtemperarem; boves ibi, in Occitania capræ et verveces infestabantur; oriebatur ab inappetentia, ruminationis cessatione, languore, boves passim in campis tristi et demisso capite vagabantur interdum ejulantes, salivantes, dein frigebant auribus, fremebant toto corpore, alvi fluxum successive cruentum et torminosum patiebantur, hinc colliquatio, fæces oleosæ et mucosæ cruentæ, paucissimi sanabantur obortis ad nares et caput *pustulis crustaceis*; et alopecia subsequente."

Sauvages, in the genus *Pestis*, would appear to describe under the species *carbunculosa* a disease nearly allied to, if not the same with, the *pestis bovilla* of Ramazzini.

"*Pestis carbunculosa. Charbon pestilentiel, pestis Indica, Carazzo* Gemelli Carreri. *Anthrax pestilens* Auctorum." Of this disease he says, "aggreditur rusticos qui carne vervecum anthrace peremptorum in cibum adhibent; pastores, laniones, lotrices qui eorum cadavera, lanam tractant."

He then subjoins this question—"An morbus ardentium, *mal des ardens*, qui olim in Gallia pestis instar strages horrendas edidit, fuerit pestis carbunculosa?" And yet afterwards, in his *character* of

Erysipelas pestilens, he adds, " Feu S. Antoine, Feu Sacre; ægri ardentes; ignis sacer, Mezeray hist. Franc. anno 1090. Mal des ardens en 1130 sous Louis VII. Mezeray."—and he farther says, " An ad erysipelas, an anthracem referenda sit hæc epidemia dubito."

Another species of pestis in Sauvages' Nosology is, from the accounts of various writers on the Lues bovilla, intimately connected with that distemper, indeed it may be said to be identified with it, as occurring in the same epidemic. He thus defines it:

" *Pestis Glossanthrax,* Ligeri *de morbis jumentorum, domo rustica.*

" Boves, equos, mulos per Galliam, necnon homines plures Nemausi anno 1732 infecit et jugulavit hæc pestis, quæ ad linguæ radicem anthracem proferebat quo tota sensim lingua intra paucos dies exedebatur, hâc vero erosâ penitus, jumentum quod huc usque præter febrem et virium aliqualem prostrationem functiones suas aliquatenus obibat, illico moriebatur."

It is here worthy of remark, that Sauvages under the head of " Cynanche maligna" observes: " Hæc species ante triginta annos epidemica fuit circa Nemausem, maximè inter boves; atque etiam aliquot homines infecit."

As we descend nearer to our own time, we meet with increased accuracy of observation in writers of medical and natural history. Thus, in the course of the last century are to be found luminous and instructive accounts of various epizöotic diseases:

among others, Dr. Layard has in the Philosophical Transactions for the year 1780, part 1st, furnished us with an excellent description of an eruptive disease attended with fever, which affected black cattle in England, the progress and symptoms of which he watched with sedulous care, and has given with great discrimination. "The disease," he says, "among horned cattle is an eruptive fever of the variolous kind: it bears all the characteristic symptoms, crisis and event of the *small-pox;* and whether received by contagion, or by inoculation, has the same appearances, stages, and determination, except more favourable by inoculation, and with this distinctive and decisive property, that a beast having once had the sickness, naturally or artificially, never has it a second time.

"According to the several prejudices of different countries, various opinions have arisen of the nature of this sickness. Such as are averse to inoculation have obstinately refused to acknowledge it was similar to the small-pox in the human body, and have very idly asserted, that the only intention of declaring this contagion to be a species of small-pox, was purposely, and with no other view than to promote inoculation for the small-pox. Others have as positively declared it to be a pestilential putrid fever, owing to a corrupted atmosphere, and arising from infected pastures. But unfortunately for the supporters of this opinion, while the contagious distemper raged with the utmost violence on the coasts of

Friseland, North and South Holland, Zealand, and Flanders, there was not the least appearance of it on the English coast, from the North Foreland to the Humber, although the coast and climate are the same."

This destructive disease so vividly depicted by Dr. Layard's pen appears to have been first noticed in England, in the year 1745; and to have continued there through the three succeeding years. The contagion is said to have come from Holland, the horned cattle of which had been previously and were at the time, affected similarly. In a letter from Vicq d'Azyr, dated Paris, August 28th, 1780, to Dr. Layard, respecting the distemper among horned cattle in Picardy and the neighbouring provinces during the years 1779, 1780, are these words: "Il me paroit comme à vous que c'est toujours la même maladie qui a regnée depuis 1711, et qu'elle a de grands rapports avec l'eruption varioleuse." And in his "Precis historique" of the pestis bovilla as it appeared in Picardy, he says of the diseased cattle: "Quelques uns ont eu le cou couvert de boutons; et cette terminaison étoit ordinairement heureuse." From the preceding facts it is impossible to doubt that some of the inferior animals, as well as man, have been liable to small-pox in some of its worst forms. The result of Dr. Layard's experiments by inoculation has given an interest and a confirmation to this truth, which greatly increases its value. Had the disease which he observed in

cattle been of a mild, instead of a malignant nature; and had he attempted to communicate it to man by inoculation he might, perhaps, have anticipated the great discovery which I am commemorating in the life of Jenner. He has, at all events, proved that the disease was communicable from one animal to another by inoculation, and that it was thereby rendered milder. When Dr. Layard wrote, it was of less importance than it now is to illustrate the connexion between the diseases of man and the inferior animals: no trials, therefore, were made to ascertain whether the *Variolæ* of man could be communicated to the brute, or *vice versa*. The discovery of the *Variolæ Vaccinæ* has fully established the latter point; and although attempts to demonstrate the former have failed in the hands of some, other investigators have been more successful.

M. Viborg, professor of the veterinary college at Copenhagen, says that he succeeded in communicating the human small-pox to dogs, apes, and swine; he asserts also that it has been proved by experiments at the royal veterinary college at Berlin, that the cow likewise receives the small-pox by inoculation.*

* Medical and Physical Journal, Sept. 1802, page 271.

CHAPTER VI.

SKETCH OF THE HISTORY OF VARIOLA, AND OF VARIOLOUS INOCULATION.

I TRUST that the propositions which the preceding discussion was intended to elucidate and establish have received confirmation. The evidence disclosed by the phenomena of the *Variolæ Vaccinæ* will, I doubt not, be found to corroborate in a very striking manner the historical proofs. To render that evidence still more complete we must trace the *Variola*, as it has been recognized in man, with somewhat greater minuteness. Having so done, and also given a sketch of the effects of variolous inoculation, the connexion of the whole argument with Dr. Jenner's discovery will be rendered more apparent.

In opposition to the views taken of the remote origin and subsequent progress of small-pox it may be argued, as has already been urged by Sydenham,

Freind, Mead, aud other celebrated physicians, that as no full or accurate description of small-pox, as a specific disease, has been given either by Hippocrates or Galen, we are fully warranted in concluding that no such disease was known to them, or to the ancient world. This appears plausible, at least; but is by no means convincing—for in addition to the arguments heretofore stated I would now remark that Aaron, the first acknowledged writer who has treated of small-pox methodically and by name, assigns the same cause for its production as for that of measles, and bubonic plague. Furthermore, Rhazes, who refers to the works of Aaron with high approbation, considers small-pox and measles as one disease; and expressly declares his belief that it was well known to Galen: indeed, in proof of this he quotes three passages from Galen's works, in each of which a particular morbid affection or disease is mentioned by Rhazes, which is asserted to be *variolæ* or small-pox. He even expresses great surprise that Galen has passed it over in a manner so slight or transient—especially when it must have been of such very frequent occurrence in his day; and when, also, there must have been such weighty reasons for opposing it by remedies, and he, (Galen) so diligent in investigating the causes of other diseases, and in finding out remedies for them. Rhazes, however, adds, as if in full confidence of Galen's zeal and accuracy: "But God knows whether he may not have treated of small-pox in some of his books,

which have not yet come out in Arabic."* Yet from this very silence, as they call it, of Galen on this particular subject, Sydenham, and still more strongly Mead infer his entire ignorance of *variolæ*. Dr. Mead uses this strong language on the occasion: "Frustra enim sunt, qui ἀνθρακας, ἐπινυχλίδας, et consimilia in cute ἐξανθημαῖα, variolas nostras esse contendunt." "Ex Arabum igitur medicorum libris petenda est prima morbi hujus notitia. Horum facile princeps Rhazes circa annum æræ Christianæ 900 inclaruit."†

The explanation of this discrepancy in the opinions of medical writers on small-pox will, I believe, be found only in the views I have endeavoured to unfold respecting the antiquity of this disease; whence it will be seen that though the ancients, as well physicians as historians and poets, saw and knew it in its various forms and modifications yet from its mode of

* Vide Rhazes de Variolis et Morbillis apud Mead, Vol. I. p. 357.

† It is worth while here to remark, that in the tract of Rhazes, translated from an Arabic MS. at the express desire of Dr. Mead, and by him published as an appendix to his own treatise on small-pox, the term Variola is that adopted by the translator to express the original Greek word or epithet employed by Galen to designate the disease, which is pronounced by Rhazes to have been small-pox. The translator of Rhazes' work into Greek has denominated it περὶ λοιμίκης, the identical epithet used to denote pestilential epidemics among the Greeks from Thucydides, downwards: he uses λοιμὸς in his account of the pestilence at Athens.

attack, its concomitant fever, its malignant and highly contagious nature, but above all its terrific mortality, they blended and confounded it with other desolating pestilential distempers; considering and treating of it as such: yet notwithstanding this error and confusion, many of them have described some of the characteristic symptoms (the eruptive) of Variola, quite as accurately as more recent authors who have written expressly on that disease as distinct from bubonic plague. We have also much reason to think that the ancients, under the term of Ignis sacer, have frequently depicted the eruption of small-pox; and that the ecclesiastical and monkish chroniclers since the Christian era have, under the same name, or under the designation of pestis, given us accounts of epidemic small-pox.

After the presumptive, indeed I would almost say the positive, proofs of the existence of small-pox in various cities and districts of Europe anterior to any, even the earliest, period usually assigned to its appearance by medical writers of the last two centuries, I should deem it an idle task to dwell much longer in tracing its history through the remaining ages of ignorance and mental darkness; a rapid glance through these times of superstition may suffice.

The first recorded case of small-pox or Variola, under that peculiar, and now appropriated, name, is probably that of Elfrida daughter of our English Alfred and wife of Baldwin the Bald, Earl of Flan-

ders: the date of her illness is generally fixed as A. D. 907: she recovered.

The next case to be met with in the monkish annals is that of the same Elfrida's grandson Baldwin, who was carried off by fatal small-pox in early life A. D. 961. Thus more than half a century passed over without any historical notice of Variola, under that special designation, though not a doubt can now be reasonably entertained that the disease had, in the interval, ravaged many parts of Christendom.

I mention these cases chiefly for the purpose of suggesting to my reader how very little of accurate medical statement he is to look for, or to expect, in the European history of small-pox, even after the disease was fully recognized by the Arabian physicians as distinct from ordinary or genuine plague.

It was probably about this period that the name of Variola, with its connate or derivative terms, was adopted by the Latin family of Europe, whilst the Teutonic or Saxon assumed that of pocca, or pock, or little pouch; the former most likely derived either from varus, a pimple, a spot, or from varius, speckled, spotted. But though the disease had thus obtained a more distinctive name than those by which it had been previously designated, or rather confounded with others, such as λοιμὸς or λοίμικη among the Greeks; *pestis*, *pestilentia*, lues, among Latin writers; still its characteristic or peculiar nosological symptoms con-

tinued ill-defined even among the Arabian physicians prior to Rhazes, who quotes their authority with his approval. Aaron of Alexandria, in the beginning of the 7th century; Bachtishua, physician to the Caliph Almansor, in the 8th century; John of Messue, at the close of the 8th or beginning of the 9th century; Isaac Judæus, in the 9th century; Serapion, at the close of the 9th century,—though they all treat expressly on small-pox, yet their respective descriptions of the pathognomonic signs are not very accurate or complete, their theories, as to its origin or cause, absurd or ridiculous, and their plan of cure injurious. None of them even hint at its being a *new* disease, though it must have been in their days a most widely diffused and fatal affection. * Aaron assigns as its efficient cause, *adust blood*, and *bile*, in common with plague and all other malignant fevers. "Et generantur omnes (eruptiones malignæ) ex malo sanguine adusto cum cholera."

† Isaac the Jew has descanted expressly "De febre variolarum, quæ *fere omnibus* accidit."

‡ Johannes Serapion treats of it among impost-

* Consult Rhazis Continentis, lib. xviii. cap. 8.

† Lib. Febrium Isaac Israel. cap. V.

‡ In the subsequent abstract of the medical writers on small-pox, I have to acknowledge my large obligations to the History of Small-pox, by James Moore, Esq., and to Dr. Valentin, of Nancy, in his History of Small-pox. Both of these gentlemen entertained the sincerest friendship for the author of vaccination, and I am sure that they will never consider their labours as misapplied when employed to elucidate his doctrines.

humes in his work "De Plegmone, et Almessere (Erysipelas) et Igne Persico, et Variolis." Yet this same author classes small-pox among fevers in a chapter, "De cura febris causatæ a variolis.*"

Thus far we do not find that the Arabic writers much excelled their Greek and Latin precursors or contemporaries, either in their theories or delineations of this disease. Indeed Hali Abbas (A. D. 980) has improved somewhat in the descriptive part, and he seems to have had a glimpse of the contagious nature of Variola.

In the following century Avicenna has given a view of small-pox and measles more clear and distinct than any of his predecessors. He describes the pustular eruption more accurately, and distinguishes between the confluent and distinct kind; and seems to consider the measles as different from small-pox, in a degree at least; as he takes notice of the weeping eye and the pneumonic inflammation in the latter disease. Both he pronounces to be very contagious: and he, like Rhazes, observes that *small-pox may affect the same individual twice.*† Nearly contemporary with Avicenna in Asia, lived Avenzoar in Spain. He has added little to the knowledge imparted by his forerunners in the history of small-pox.

Constantinus Africanus flourished towards the end of the 11th century. He was undoubtedly a

* Lib. Joh. Serapionis in Lat. tradit. Venet. 1558.

† Avicennæ lib. 4. 1. cap. 10.

learned physician, considering the age of ignorance in which he lived. Though well acquainted with the Arabic he wrote in the Latin language, and settled ultimately in Italy. He treats of small-pox and measles as one disease; and has not increased our knowledge of either. He, however, revived the knowledge of Greek medicine, and introduced an acquaintance with that of the Arabians.

Little additional light is let in on the history or treatment of small-pox from the beginning of the 12th to the middle of the 17th century, though we have a long list of medical writers, as Averrhoës and Albucasis, both Arabic physicians, and among the last of that school.

Next follow Francis de Pedemontium, Arnaud de Villeneuve, and others who treated of small-pox and measles under the title of Anthrax and Carbuncle, conceiving them to be of the same pestiferous nature, which, as I have already pointed out, was the opinion of the older historians and physicians: these close the 13th century.

Nearly contemporaneous lived Gilbert, in the reign of our first Edward. His Compendium of Medicine is the earliest medical production that England can lay claim to; yet his work is not original, with respect to small-pox and measles, since he has copied from the Arabian writers;—as did also his English successor John of Gaddesden, physician to Edward II. He was a servile copyist of the Arabic school, and his only dogma worth recording with

regard to small-pox is "Aliquando variolæ bis hominem invadunt."

During the 15th century astrology and alchemy occupied so powerfully the minds of the learned that the medical history, symptoms, and treatment of small-pox could not be expected to receive either elucidation or improvement, even from such great names as Fracastorius and Paracelsus. But towards the end of this century, or early in the following one appeared Fernelius, who becoming Professor of Medicine at Paris, may well take his rank as the restorer of that science. Though he was a believer in astrology and magic yet he possessed uncommon talents and brought industrious application to the study and practice of his art, and to the acquisition of natural knowledge. He does not make mention of either small-pox or measles by name, but includes them among pestilences, under the terms of Exanthema and Ecthyma.*

Fernelius rejected the theories of the Arabian writers on small-pox, and made some approximation to the doctrine of the operation of contagious effluvia: his mode of practice in this disease is not exactly known, but his treatment in ardent fevers appears to have been wonderfully judicious, for his time.

In the 16th century Forestus returned to all the absurd notions of the Arabians respecting the *causes*

* Fernelii Opera, lib. ii.

of "*variola et morbilli;*" and followed the hot and stimulating mode of treatment.

He observes that the same individual may have the small-pox twice "id quod verum esse experientia rerum magistra testatur: ut et nos in nostro filio, qui bis variolas habuit, licet puer; et in aliis multis ægris observavimus."*

It is apparent from what has been said that it was a general belief among the early writers on small-pox that the disease might affect the same individual twice. Dr. Mead, without due inquiry, promulgated an opinion of a different kind, and from his time till within these few years, that opinion was so blindly followed that when small-pox did occur a second time it was set down as chicken-pox, swine-pox, or some other eruptive disease. When the friends of vaccination were compelled to prove that the small-pox did occur a second time it was believed that they drew on their imagination for such facts. The antivaccinists who made this charge showed themselves as little acquainted with the real history of small-pox as they were with that of cow-pox. One very remarkable example of the kind alluded to, namely, the death of Louis the Fifteenth at the age of sixty-four, from small-pox, after having undergone that disease at the age of fourteen years, made a great sensation throughout Europe. Without loading this work with a long list of medical authorities I may mention that more than one hundred

* Petri Foresti Opera, lib. vi. obs. 43.

and thirty different writers may be named who have recited examples of such an occurrence.

Mercurialis and Sennertus, in the sixteenth and early part of the seventeenth century, have added but little to the records of small-pox, though they both improved its mode of treatment by recommending a cooler regimen; and to abstain from opening the pustules, or otherwise meddling with them. These writers declare that the disease may attack the same person twice. This fact is also asserted of their own knowledge by Willis and Diemerbroëk, neither of whom, however, has much increased our historical information respecting this disease.

During the seventeenth century Kircher, Sylvius, and several other continental writers have treated of small-pox, inventing new theories, or modifying or adopting the old: but it would be worse than idle to follow them in the labyrinths of vain speculation, for Sydenham arose at this time, imbued with the spirit of experimental philosophy which he had learned from the mighty mind of Bacon, the first of men uninspired.

Sydenham discarded all theories respecting small-pox: he separated this disease from measles, with which it had been always blended by authors from the revival of medical learning under the Arabian physicians to his own time: and he gave such an accurate description of symptoms, and adopted such a judicious plan of cure in both diseases that he left little room for improvement in either, till the

introduction of inoculation, which so far mitigated small-pox to the individual undergoing that treatment as almost to have disarmed a fearful pestilence of its terrors. But, though by this salutary practice individual welfare was consulted and, in most instances, obtained, still the public safety was endangered, nay more than endangered; for there cannot be a doubt that, in this way, a loathsome and destructive malady was kept alive and widely spread abroad, in all its baneful activity, among those classes of society who either would not, or could not avail themselves of the disarming power of inoculation.

The views and treatment of small-pox by Hermann Boerhaave were not far different from those of Sydenham. He (Boerhaave) considered the disease very much as an inflammatory fever; epidemical, however, and alone proceeding from a peculiar contagion exhaling or thrown out from the bodies of persons infected by, or labouring under, the disease; perhaps it was from a consideration of this kind that he was led to believe that a specific might possibly be found to overcome the matter of this contagion, or to cure the disease when formed. He suggested a combination of antimony and mercury. Could he have looked into futurity, and known by anticipation the sure preventive since traced out so admirably by the unwearied sagacity of Jenner, how must his best feelings have been gratified!*

* As Boerhaave's aphorism containing the conjecture here alluded to has been put forward, apparently to lessen the merit

Succeeding writers on the small-pox, as Freind, Mead, and others immediately prior to the introduction of inoculation, follow very closely the track marked out by Sydenham, and where they have deviated from it have not added to his positions, nor improved on his descriptions.

of Dr. Jenner in the discovery of vaccination, I feel it right as his biographer to remark in this place that Boerhaave's prospective view of an antidote extended, and could only extend, to some pharmaceutical preparation, or physical remedy to be used *internally* for the purpose of destroying or correcting the virulence of the contagious poison whatever that might be: and I will further add that by no possible interpretation can his words be made to show the most remote allusion to any external means to be discovered as preventive. I shall now give, in proof of this assertion, the aphorisms which refer to this subject in Boerhaave, merely premising that his view of it led to the combination of mercury and antimony in *Sutton's* celebrated powders for small-pox.

Aphorism 1388. "Cognito hoc morbi statu (1380 ad 1387) indicatio oriri videtur hæc primo; ut, stimulo inflammatorio ablato, sanetur status præsens et impediatur ulterior ejus progressus, et proinde caveatur futura suppuratio, gangræna, &c."

Aphor. 1389 "*Stimulus* videtur auferri posse correctione per specifica ita dicta, vel methodo universali antiphlogistica."

Aphor. 1390. "Correctio specifica niti debet invento *remedio* opposito illi veneno contagioso, quod tam parvâ mole susceptum reliqua parit ut effecta."

Aphor. 1391. "Quale (1390) invenire posse comparatio historiæ antidotorum, et indoles hujus mali, faciunt sperare, et ad indagandum impellit summa hinc futura humano generi utilitas."

Aphor. 1392. "In stibio et mercurio, ad magnam penetrabilitatem arte deductis, nec tamen salina acrimonia nimium corrosivis sed bene unitis, ut quæramus, incitat aliquis horum aliquando successus."

We have now arrived at that period in the history of small-pox when this disease was about to undergo a most salutary modification, through the determined and persevering good sense of an accomplished woman;—I say a woman, for though it is very true that the practice of inoculating or engrafting the small-pox had been published in England so early as 1714 by Dr. Timoni, of Constantinople; at Venice, in 1715, by Pylarini; and in the same year in London by Mr. Kennedy, a surgeon, who had been in Turkey, yet it is certainly to the influence and example of Lady Mary Wortley Montague we are indebted for its introduction and adoption in England; and for its consequent diffusion through Christendom. Her ladyship's first letter to England on the subject is dated 1st April, 1717: and soon after she caused her own son Edward, then a child, to be inoculated at Constantinople by Mr. Maitland, surgeon to the British Ambassador Mr. Wortley, her husband.

On her return to England in 1722 Lady Mary had her daughter inoculated by the same Mr. Maitland, this child being the first known subject of the new practice in civilized Europe; the second was a child of Dr. Keith, a London physician, who had witnessed the progress of inoculated small-pox in Lady M.'s daughter. This was creditable to the Doctor, and must have given a fresh impulse to the practice: yet it made very slow advances, although the then Princess of Wales, with the King's consent, caused

two of her own daughters to be inoculated. It was ascertained that the accounts of success and immunity at Constantinople were not fully borne out by facts; and in England the inoculated small-pox was found in some cases not to turn out by any means so mild an affection as had been represented by the advocates for the new practice, and it was occasionally fatal. During the first eight years after its introduction into England the number of persons inoculated amounted to 845 only and, of these, 17 died of the disease: nearly as one to fifty. Though this was a greatly diminished mortality compared with *that* attendant on natural small-pox yet it impeded the progress of inoculation, which had still to encounter violent opposition from many quarters. Some over-zealous men from a religious feeling (as it is to be hoped they thought) opposed the novel practice of inoculation as an attempt, at once impious and unavailing, to counteract the visitations of an all-wise Providence; asserting that in the case of adults, who assented to the voluntary infliction of a fatal disease on themselves, the crime was that of suicide, but in respect to children it was "horrid murder of the little unoffending innocents." Even clergymen preached from their pulpits in this style of argument (if so it might be called). Some went so far as to pronounce inoculation an invention of Satan himself—and its abettors were even charged with sorcery and atheism. These things would scarcely obtain credence were it not that similar arguments

and assertions have been employed against vaccination itself. One sermon, by a reverend rector of Canterbury, is dated so lately as 1753.

Justice to the learned body of the clergy of that day requires it to be mentioned that many of them, with the Bishop of Worcester (Dr. Maddox) at their head, maintained publicly the innocency of the new practice; nay more, they defended its adoption on the score of Christian duty. The opposition of medical men was temperate though ill-founded, save in those who said, and said truly, that by inoculation the small-pox, however milder and safer it might be thus rendered to the individual subject of it, must necessarily be more extensively propagated, from its contagious nature, and its fomes kept alive and active for ever.

These objections carry with them great weight, the last especially: nevertheless the great body of the medical profession was decidedly favourable to inoculation.

Notwithstanding all this the practice made little progress in England for nearly twenty years; indeed, about the year 1740 it had almost fallen into neglect, or disuse. In Scotland and Ireland it was still more unsuccessful; and in Germany it could scarcely have been said to have been tried, except at Hanover very partially.

Such was the hopeless state of the cause of variolous inoculation in Europe when accounts highly favourable were brought from both Americas, and

from the West Indies. In one of these islands (St. Kitt's) a planter (as is related by Dr. Mead) inoculated three hundred slaves without the loss of one; in Carolina the loss was stated as one in one hundred; and in South America it was reported as still less. These accounts revived the practice in England; so that in 1746 the Small-pox Hospital in London was founded for the purpose of inoculating the poor, and of keeping the patients distinct from the general population of the city.

This judicious regulation was afterwards departed from by inoculating all persons who applied at the hospital, and thus the disease in its natural form was disseminated far and wide throughout the community.

It was confidently, though mistakenly, asserted by the advocates for inoculation about this time (1752) that the number of deaths from small-pox, in the bills of mortality, had diminished by one-fifth since the practice of inoculation had been adopted: this statement, however, was erroneous; for, in fact, they exceeded those of any former year; amounting to 3538, in 1752. In 1754 the College of Physicians in London declared their fullest approbation of the practice of inoculation. Had they accompanied this with a recommendation to keep the infected apart from the non-infected they would have more fully performed their public duty.

In Scotland the progress of inoculation was so slow that, so late as the year 1765, not more than

6000 persons had received it: and there the mortality was as one to seventy-eight, of these persons.*

At this time also its advancement on the Continent had been very tardy and limited. In Germany attempts had been early made to introduce inoculation but they did not succeed to any extent, perhaps in consequence of the opposition of Van Swieten and De Haën; and in France the practice was condemned by the faculty of medicine at Paris. This brought it into disuse for thirty years at least, till M. de la Condamine, and the celebrated minister Turgot (in 1755) espoused the cause with energy and zeal; the nobility, also, led on by the example and countenance of the Duke of Orleans who had caused his own son and daughter to be inoculated, gave effect to the recommendations of the statesman, and the man of letters; and soon the practice spread through France. It was, however, in 1763 prohibited by royal authority, in Paris, in consequence of small-pox having raged as an epidemic in that city attended with such dreadful mortality as to have aroused the notice and fears of the police and of the parliament, who on investigation found that the infection was multiplied and diffused by means of inoculation. This is a melancholy truth; and at all times formed the most forcible, perhaps the only strong objection to inoculation.

* See an account of inoculation in Scotland, by A. Monro, M. D.

It is asserted that in Spain,* where the practice was scarcely ever admitted, small-pox has caused less mortality in proportion to the population than in any other country in Europe. If documents prove this assertion (and I have no doubt of its truth) it had probably been better for mankind that the practice of inoculation had never been adopted, in the partial way it has been, in Europe and without the proper restrictions and the entire seclusion and separation of the infected from the uninfected.

The Suttonian method, as it has been called after its author Daniel Sutton, was certainly a great improvement both as regarded individual recovery and public safety. In 1768 the Empress Catharine of Russia invited Baron Dimsdale to Petersburgh; and submitted herself and her son Paul to his treatment by inoculation. This high example, of course, spread the practice among the Russian nobility, and with it diffused the natural small-pox and all its attendant evils and mortality. So fatal had that disease become in Russia throughout its immense extent that Sir Alexander Crichton, the imperial physician, states a calculation from which it appears that, previously to the adoption of vaccination, every seventh child born in Russia died annually of small-pox.†

* See Moore's History of Small-pox, p. 287.

† Moore's History of Small-pox, p. 286.

CHAPTER VII.

DR. JENNER'S OPINION RESPECTING THE ORIGIN OF SMALL-POX AND COW-POX—ILLUSTRATIONS OF THAT OPINION—PROOFS OF ITS ACCURACY.

We have now brought the history of the Variolæ to a period not far distant from that in which the disorder incident to cows began to attract attention in England, from its reputed virtues as a preventive of small-pox; and have arrived at that point which, I trust, will give an interest to the preceding investigation that it could not have acquired as a mere historical disquisition.

It was quite an unlooked for, and at first almost an incredible thing that a disorder immediately derived from one of our domestic animals should exert an influence so powerful and so beneficial on the human frame. But if it should appear that the disease incident to man and to beasts had one common origin; and that an analogy, close and well-defined, may be traced in their subsequent history and progress we shall have obtained evidence to explain

pathological facts which are of the utmost value to mankind.

From what has been already adduced it is clear that a fatal pestilential eruptive disease, common to man and the inferior animals, has been known from the earliest period of authentic history: that the same, or at least a disease somewhat similar, continues to exist in various regions of the earth, often attended with great mortality: that it appears to have undergone various modifications in respect to virulence; and to be susceptible, by artificial communication, of still greater modification.

Should it appear that the views which I have attempted to illustrate rest upon a solid foundation, they will tend, I would hope, to give a stability to the practice of vaccine inoculation which was not formerly experienced. They will also explain how sheep, or horses, or any other animals may be subject to the disease as well as cows or oxen: that it is not a poison peculiar only to one variety, but may be found and propagated among many.* It need not

* To corroborate the preceding views I select the following passage from one of Dr. Jenner's manuscripts.—"Our domesticated animals are subject to a variety of eruptive diseases: the horse, the cow, the sheep, the hog, the dog, and many others. Even poultry come in for their share. Again, there certainly must be a reason why the term *chicken* is annexed to a species of pock, which infests the human skin. In the province of Bengal the poultry are subject to eruptions like the small-pox, which become epidemic and kill them by hundreds. The Europeans to stop its depredations have even tried the effects of in-

therefore excite surprise that *matter* capable of producing the genuine pustules should be found in the horse, as it unquestionably has been in this country and elsewhere; or that the disease should make its appearance among sheep, as it is reported to do in Persia, and in goats in other countries. That the goat also is subject to an eruptive pustular disease, similar in its nature to the Variolæ Vaccinæ, is proved by the following extract from a letter of Mr. Dunning, surgeon, of Plymouth-Dock, addressed to Dr. Jenner some time in the year 1804, "My late correspondent at Madrid is now in England, and has been lately favoured with the following from Professor Heydeck:—

"Madrid, March 9th 1804.—I am not able to send you, at present, our observation on the goat-pock subsequent to the 8th of June last, because it is not finished yet; for the king has ordered in September last that all the children in the Foundling-house, and those who are in the Desamparados should be inoculated with the goat-pock, which did its effects; we are now employed in the contra-proofs, and after every thing is finished, shall send the whole process to you for the inspection of your medical friends and Dr. Jenner; and as I am at present *on another discovery, not less useful*

oculating their chickens. The East Indians have only one name for the small-pox, and this disease, *gootry*. The origin of the term chicken-pox, then, no longer remains mysterious. Whether the poultry in our own island feel the same complaint I do not know."

as the goat-pock, I shall give also an account of its results in my next letter." Mr. Gunning adds, "I wrote to the Professor about three weeks ago, told him that his discovery had excited very much the attention of the medical world in England, and more immediately Dr. Jenner's, and urged him to forward his further observations with all the expedition in his power, and that I would transmit them to you."

I cannot *here* refrain from again adverting to a fact stated by Sauvages under the head of his *Dysenteria Pecorum*—(the *pestis bovilla* of Lancisi and Ramazzini; and the *Lues Vaccarum Tubingen.*) "Morbus hic totam successivè Europam, et demum nuper Galliam devastavit, atque boves eripuit. Hunc *observavi* apud Helvios Comitiorum, *boves* ibi, in Occitania *capræ* et *verveces* infestabantur."

As the existence of the Variolæ Vaccinæ in the dairies of England would seem not to have been of very long duration I think there is good ground for believing that the disease, as originally noticed by Dr. Jenner in Gloucestershire, was the endemic or local remains of the more general or epizöotic disease which prevailed in many parts of this island, at the period when Dr. Layard wrote.

This opinion is strengthened by the following well-authenticated facts. Soon after the publication of Dr. Jenner's discovery it was found that cow-pox existed in several counties of England—in Devon, Dorset, and Somerset, in Hampshire, Buckingham-

shire, Middlesex, Wiltshire, Staffordshire, Norfolk, &c. in all, eighteen counties. Accounts were also received of the existence of the Variolæ Vaccinæ among the cattle of Lombardy, Holstein, and other regions where the pestilential eruptive disease, denominated *pestis bovina*, had previously raged, as recorded by Ramazzini and other medical writers. At a later period it was also found in Persia, both in cows and sheep, as appears in a letter from Mr. Bruce, English Resident in Bushire, (11th vol. of the Edinburgh Medical and Surgical Journal, p. 270). It was discovered also by Don F. X. Balmis among the cows of the valley of Atlixco, near the city of Puebla des los Angeles; in the neighbourhood of Valladolid de Mechöacan where the Adjutant Antonio Gutierrez found it; in the district of Calabozo in the province of Caraccas, by Don Carlas de Pozo Physician of the residence, and by Humboldt in the Peruvian Andes.

In the Report of the Central Committee of vaccination in Paris for the year 1821-22 it is stated that the disease has likewise been found in the vicinity of Clairveaux, by M. Janier Dubry; and to this list Ireland ought to be added on the authority of Dr. Barry, of Cork. From these facts it may very fairly be inferred that the Variolæ will hereafter be found among cows in other parts of the world.

That this disease has already been met with in regions so remote from each other is a proof that it cannot depend on mere local circumstances, either for its origin, or propagation; and that, like small-

pox itself, it has pursued its victims through every clime and in every season. I cannot but feel that this circumstance, coupled with the facts already mentioned, adds great weight to the opinion as to the affinity between the two affections.

This opinion, drawn as it is from an impartial consideration of well-authenticated historical documents, comes with much force to support the sentiments of Dr. Jenner grounded on his own observations. He always, as has been said, considered small-pox and cow-pox as modifications of the same distemper; and, that in employing vaccine lymph, we only made use of means to impregnate the constitution with the disease in its mildest, instead of propagating it in its virulent and contagious form; as is done when small-pox is inoculated. Had his views been deliberately examined, and had the consequences to which they clearly lead been kept in mind by the different writers who have distinguished themselves by their zeal in the vaccine controversy, much of their bitterness might have been forborne, and many needless and irritating discussions avoided. The fact having been admitted, as with reason it might have been, that there was such an affinity between small-pox and cow-pox, it would have at once appeared reasonable to expect that the same general laws should govern both affections with regard to their prophylactic powers. Thus, if there were different degrees of security afforded by small-pox against the recurrence of that disease, it was quite

natural to expect that similar modifications might be found in the protecting virtues of the Variolæ Vaccinæ.

These views are not at all affected by the doctrine which Jenner promulgated respecting the origin of Variolæ Vaccinæ from the heel of the horse. Although there is now no room for any doubt that the Variolæ may be thus derived yet it is probable that the grease, as it is called in the horse's heel, is only the mode in which the disease commonly exhibits itself in that animal. The following remarks of Dr. Jenner himself will best illustrate this statement.

"The skin of the horse is subject to an eruptive disease of a vesicular character, which vesicle contains a limpid fluid, showing itself most commonly in the heels. The legs first become œdematous; and *then* fissures are observed. The skin contiguous to these fissures, when accurately examined, is seen studded with small vesicles surrounded by an areola. These vesicles contain the specific fluid. It is the ill management of the horse in the stable that occasions the malady to appear more frequently in the heel than in other parts; I have detected it connected with a sore on the neck of the horse, and on the thigh of a colt."

This doctrine I hold to be substantially true; for it has been established by unquestionable evidence that matter from the horse *does* produce a pustule similar in appearance to the vaccine; and likewise possessing the same protecting

power; and *that*, without having passed through the constitution of the cow. This fact, though it prove the identity of the diseases, does not prove that they both originated in the horse; but it goes strongly to confirm the view of the simultaneous origin of the affections in question. When Dr. Jenner published his *Inquiry* he was not aware of the independence (if I may so speak) of the properties of the *matter* of *grease;* that is to say, he did not believe that it could excite in the human constitution an influence like that of vaccine matter, without previously undergoing certain modifications in the system of the cow.

It seems certain that there are, at least, *four* animals, namely the horse, the cow, the sheep, and the goat which are affected with a disorder communicable to man; and capable of securing him from what appears to be a malignant form of the same disease. It is moreover proved by direct experiment that other animals are capable of receiving the vaccine disease by inoculation; and that matter taken from pustules so produced affords the genuine cow-pox in man. The animals on which these experiments have been tried are the dog, the goat, the she-ass, and the sheep. The fact as regards the dog was ascertained by Dr. Jenner: with respect to the other animals I rest on the authority of Dr. Valentin, of Nancy, who made his experiments in 1801–2.

When we place these facts in conjunction with

those already stated on the authority of professor Viborg, of Copenhagen, it is impossible not to find strong corroboration of the doctrine of the similarity of small-pox and cow-pox. Some incidents which occurred at the Small-pox Hospital in London, soon after the publication of Dr. Jenner's first work, infallibly lead to the same conclusion. The blunders which unhappily occasioned these incidents had for a time a most injurious effect on vaccination: it will, therefore, be some consolation if we can now extract from them any thing to give confidence in the practice, and to further its dissemination. By a most unfortunate mistake some of the very first trials that were made in the Metropolis were conducted in the Small-pox Hospital, under the direction of the late Dr. Woodville. The place chosen for these trials, as well as the manner in which they were carried on, reflect no credit on the projectors. What might have been anticipated soon took place, the vaccine and variolous virus were commingled, and an eruptive disease was thus produced milder in its nature than ordinary small-pox, but very different from the benign *solitary* pustule which characterizes the Variolæ Vaccinæ. Dr. Jenner immediately detected the error, and its cause; but the persons who fell into it did not abandon it till they had propagated the evil over many parts of Europe. The consequence was that eruptions, in greater or smaller proportion, followed the inoculations which were performed with the vitiated virus.

But the fact of highest importance, ascertained from these trials, was that even this *matter* after repeated re-inoculations lost much of its virulence; ceased altogether to produce eruptions; and at length became almost assimilated to the true vaccine character. This will be found recorded in a subsequent page, in a letter from Dr. Jenner to Lord Egremont.

Still further to elucidate the preceding observations let us advert to some of the facts connected with the natural history of the Variolæ Vaccinæ. Though they have not appeared recently in a fatal or malignant form among the cattle, it is certain that they sometimes proved a severe and troublesome disease to those who caught it from the cattle, insomuch that an experienced surgeon anticipated little benefit from propagating it by inoculation because as *he* had seen it among the dairy people, it was almost as severe as the inoculated small-pox. As, therefore, the Variolæ Vaccinæ sometimes assume the character of small-pox under one of its modifications, so the latter under certain circumstances approximates in its nature the mildness of the former. After a series of inoculations with true variolous matter it has often been observed that the severity of the symptoms and the number of the pustules gradually diminish till only *one* is to be seen, at the point of insertion; and that this pustule though it may have excited no constitutional indisposition, provided it has regularly

gone through its course, protects the individual from subsequent attacks of small-pox.

This fact did not escape the observation of Dr. Jenner; in reference to which he has remarked in one of his memoranda "Here then we see the cow-pox and the small-pox acting similar parts: and that in either case the virus may steal, as it were, imperceptibly through the constitution, and give no signal of its presence."

As connected with this subject it is not irrelevant here to remark that Dr. Adams, physician of the Small-pox Hospital in London, succeeded in producing a benign form of variola attended with scarcely any eruption of pustules and little or no constitutional affection; and this species of small-pox he considered capable of being rendered fixed and permanent. He selected such patients as came under his care with a mild kind of small-pox, which occasionally showed itself in London. Dr. Adams denominated this the Pearly-pox, from the pearl-like appearance of the attendant eruption; the pustules were few, distinct, and filled with limpid matter not unlike that in the cow-pox vesicle, to which indeed, according to him, this variolous pustule bore no distant resemblance. The constitutional symptoms, he also says, were very trifling, and he expressly declares it as his decided belief that he had succeeded in giving this innoxious form of small-pox permanence and uniformity.

The ancient *Thessala*, too, so celebrated for successful inoculation at Constantinople more than a century ago, was careful in taking the infectious matter of small-pox from such children only as had the disease in a mild, distinct form; thereby insuring (as she thought, and as is said to have been the case) a similarly safe affection in the person inoculated by her. She also remarked that *one* regular pustule, proceeding through its natural course uninterruptedly, gave full protection.

Although Dr. Jenner's opinion respecting the origin of cow-pox is comparatively of little moment when contrasted with the important consequences arising from the successful practice of vaccine inoculation itself, it is, nevertheless, necessary whilst investigating his character as a philosopher, to show that even in this, which was considered a wild speculation, he proceeded with his usual caution and discretion. The fact that the disorder in the cow originated from the horse had not been proved by direct experiment when he published his *Inquiry;* yet the evidence on which this doctrine rested was so complete as to entitle it to much attention. He himself has thus stated that evidence.

"1st. From its being the fixed opinion of those who have been in the habit of attending to cows infected with this disease, for a great number of years.

"2dly. From its being a popular opinion in this

great dairy-country, and from the cautions the farmer observes when he has a horse with a sore heel.

"3dly. From observing, in almost every instance, that the appearance of the cow-pox at a farm was preceded by some disease of a horse at the same farm, which produced the discharge of some fluid from the skin.

"4thly. From having attempted, in vain, to give the small-pox to the son of a *farrier* who had had sores and a fever from dressing a diseased horse.

"And 5thly. From the peculiar appearance of the pustule, and its disposition to run into an ulcer in the arm of the boy who was inoculated with matter taken from the hand of a man who received the infection from dressing a slight spontaneous sore on a horse's heel."*

Mr. Tanner had the merit of proving the truth of this doctrine: he succeeded in communicating the disease to the cow by inserting some liquid matter taken from the heel of the horse. This

* I cannot refer to this incident without calling the reader's attention to the modest and diffident manner in which the author speaks of a fact which was well nigh conclusive as to the truth of his doctrine. A beautiful representation of the pustule in its advanced stage is given in the second plate of the "Inquiry." The character of the pustule is so correct as to excite some surprise that it has been so little attended to. If it had, his opinions would, doubtless, have been treated with more respect.

produced on the teat of the cow a complete vaccine pustule. "From handling the cow's teats," he observes, "I became infected myself and had two pustules on my hand, which brought on inflammation and made me unwell for several days. The matter from the cow, and from my own hand proved efficacious in infecting both human subjects and cattle."

This experiment was in complete contradiction to some which had been instituted by Mr. Coleman at the Veterinary College, London, in November 1798, as well as by Mr. Simmons, who published in the same year, "An Account of some Experiments on the Origin of the Cow-pox."

In the month of April 1800, some observations were made by Mr. Lupton, a respectable surgeon of Thame, Oxfordshire, which were communicated to Dr. Jenner by Sir Christopher Pegge, and printed in the Medical and Physical Journal of that year, and in a very striking manner tended to confirm Jenner's opinion. The same thing was still more conclusively established by the work of Dr. Loy, entitled "Some Observations on the origin of Cow-pox," and published in 1801.

It was proved by him that the matter taken from the heel of the horse communicated an efficacious preventive of small-pox to the human subject, without previously passing through the cow. An incident corroborative of this truth occurred to Dr. Sacco, at Milan, in the year 1803. He had taken

up an opinion adverse to that entertained by Jenner; but with the candour which becomes a scientific inquirer he immediately announced his error, and bore testimony to the accuracy of his friend.

Milan, le 25 Mars, 1803.

Monsieur,

J'étais depuis long temps occupé à faire des expériences sur le *grease* pour confirmer votre opinion sur l'origine de la Vaccine. Jusqu'au commencement de cette année je n'avais jamais pu rien obtenir. La lecture du petit livre de Mr. Loy m'encouragea à repeter une autre suite. L'hiver de cette année ne pouvait pas être plus abondante de grease à cause de la quantité de l'eau qu'il avait, et par consequence de la boue dans les chemins: ainsi presque tous les chevaux souffraient le grease. Mon domestique en fut attaqué au deux avant-bras par cinq boutons pansant un de mes chevaux qui avait le grease; il ne m'en a averti que quand les boutons passaient en exsiccation: celui m'encouragea de plus à continuer mes tentatives. J'ai inoculé plusieurs enfans, plusieurs vaches avec le virus qui sortait du grease à differentes époques, mais toujours inutilement. Un cocher se présenta à l'hospital pour se faire visiter d'une éruption qu'il avait sur les mains. On connaît de suite que c'était vaccine prise en traitant les chevaux, qu'effectivement il pansait. Il fut conduit à l'hôpital des enfans trouvés où on fit quelques inoculations: il vint le même jour chez moi, et je fis neuf inoculations sur autant d'enfans, et de plus j'ai inoculé les pis d'une vache. Trois de ces enfans ont contracté une éruption toute pareille à la Vaccine. La vache n'a point pris. J'ai fait des autres inoculations avec la matière prise de ces enfans, et c'est

déjà la quatrième génération que se reproduit avec la même effet comme le Vaccin. J'ai déjà inoculé plusieurs de ces individus avec la petite verole, mais sans aucun effet. C'est donc bien sûr et consenté que le *grease est cause de la Vaccine*, et on pouvait bientôt changer denomination en *équine*, ou en ce que vous croyez mieux. J'ai aussi enfin obtenu avec le virus de grease inoculé sur six autres enfans deux boutons tous semblables aux Vaccins. Je continue mes observations. Il-y-a tout pour s'assurer qu'enfin nous aurons du grease le virus pour se mettre à l'abri de la petite verole sans passer aussi par *l'intermedium* de la vache. J'espère que cette nouvelle preuve pourra ôter les doutes qu'il-y-avaient encore sur l'origine de la Vaccine. Je publierai les résultats de ces expériences sur un code doctrinal de vaccination, au quel j'ajouterai une planche illuminé de grease. J'espère que vous aurez reçu les médailles par Mr. Woodville, à qui je me pris la liberté d'addresser le paquet pour vous le faire obtenir avec certitude. Je renouvellais mes remercîmens pour les livres que vous m'avez envoyés, avec les regrets aussi de n'avoir pas reçu aucune de vos lettres. Je comte à cette heure plus de 25 mille inoculations faites par moi seul.

Je vous prie, mon très-estimable collegue, de me donner quelque nouvelle avec quelqu'autre enseignement sur cette matière; mais sur tout honorez-moi de votre réponse.

Très humble serviteur,

Louis Sacco, Med. Chirurg.

A curious piece of rustic history communicated to Dr. Jenner by Lord St. Asaph corroborates the doctrine respecting the origin of the Variolæ Vaccinæ

LORD ST. ASAPH TO DR. JENNER.

SIR,

When I read, between four and five years ago, your publication respecting the cow-pox there was one point only which appeared to me not sufficiently proved: namely, that the disease was in its origin that which is known by the name of the grease in horses: and that it was conveyed from the one animal to the other in the manner therein asserted.

I therefore made some inquiries, in the part of Suffolk where I reside, with a view to discover whether the cow-pox was at all known in a county where the milking of the cows is performed by *women only*. For this purpose I applied to Mr. Harwood of Battisford Hall, a very respectable and experienced farmer; and particularly asked him if he remembered to have had a horse with greasy heels: and if he had remarked any such consequences ensuing from it as those which I then related to him. He assured me that he did not recollect any thing of the kind: and further told me that *he positively disbelieved* the fact which I doubted.

A few weeks after this conversation he called upon me and informed me that he had very unexpectedly obtained some information on the subject, concerning which I had before questioned him. He then told me that Samuel Nunn and his wife (who had both been servants to him and had quitted his service a few years before, on their marriage) had made him a visit; and that, talking over past occurrences, the wife, in order to ascertain the date of some event by that of another more strongly impressed on her memory, mentioned the time when all the cows had

sore udders, and when she herself suffered so much from a violent eruption on her hands and arms, the marks of which were still visible. On hearing this Mr. Harwood (recollecting the questions I had put to him) asked the husband whether he remembered if any horse in his stable had *at that time* greasy heels. The man replied that he certainly did: and named a particular horse that was so diseased for a long while. Mr. Harwood then inquired whether he ever went to milk the cows. The man's answer was, "Why to be sure, sir, that was not my business: but I was *then* courting my wife; and sometimes when I had finished my work I went to help her in hers."

I have further learned that S. Nunn was not himself infected with the disease which he thus conveyed from the horse to the cows, and that every cow in the dairy, consisting of upwards of twenty, had it. And this is the only instance that I have been able to discover of cows in my neighbourhood having been thus affected.

Such is the case which you desired me to transmit to you: and which I have thought that I could not so clearly do in any other manner as by relating to you that in which it came to my knowledge. The details into which I have entered may preclude the necessity of adding any remarks. At least I have endeavoured to render sufficiently obvious to every one, who shall have the patience to peruse my narrative, that the facts were communicated to me by an avowed disbeliever in the truth of your discovery, and obtained from those who never had heard of Dr. Jenner and of vaccine inoculation: one of whom indeed had had the disease, but without knowing it, or its name. I flatter myself that such ignorance will be in a short time no where to be found: and that in this instance, at least, we shall not "see nations slowly wise" in availing themselves of

the invaluable advantages of the discovery: nor "meanly just" to the merits of the man who made it.

I am, Sir,

Berkeley Square, Your obliged and obedient servant,
April 25th 1803. St. Asaph.

Subsequently to the observations above recited many opportunities were afforded of verifying them, insomuch that Dr. Jenner was in the practice of using *equine* matter with complete success. He supplied myself and many of his medical friends from this source. He also transmitted it to Edinburgh, where it produced the genuine cow-pox.* A fact similar to that which occurred to Dr. Sacco was observed in Paris in 1812. A coachman who had not had small-pox, and who dressed a horse affected with the *grease*, had a crop of pustules on his hands, which resembled the vaccine. Two children were inoculated from these pustules, and the genuine vaccine was excited in both: from this stock many successive inoculations were effected, all possessing the proper character. A similar series of inoculations took place from another infant who was infected from one of the scabs taken from the pustules on the hand of the coachman.

It happened to me to see one case of this kind in the autumn of the year 1817. A young man in this neighbourhood, who had dressed a horse with the grease, had not less than fifty pustules on his

* See Thompson on the Varioloïd Epidemic, p. 316.

hand and wrists. They exhibited the true character of the Variolæ Vaccinæ when taken in the casual way. The pustules were too far advanced to permit of any experiments being made with virus taken from them. I cannot refrain from remarking in this place that as the disease, whether caught from the cow or the horse, is much more severe than when communicated by inoculation, so it likewise differs from the last in being sometimes what may be truly called an eruptive disease. Besides the case just specified I know of instances where the disease, when it has been caught from cows in the dairy, has produced pustules more extensively diffused over the body than in the case above-mentioned.

Whoever has attended to the reasonings in a preceding chapter respecting the affinity of the small-pox and the Variolæ Vaccinæ will, it is presumed, find in the facts just enumerated a strong corroboration of the opinions there delivered.

CHAPTER VIII.

DIFFERENCE BETWEEN VARIOLÆ AND VARIOLÆ VACCINÆ—OBSERVATIONS ON VARIOLOÏD DISEASES.

THE preceding investigations have, I would hope, thrown some additional light upon the history and character of the Variolæ Vaccinæ, as well as upon those of small-pox. The analogies which subsist between these two morbid affections have been rendered apparent; and their high antiquity, as well as the identity of their origin, has been supported by very probable evidence. My object in collecting this evidence, connected as it is with the labours and opinions of Jenner, was to secure for the practice of vaccination that confidence to which it is so fully entitled. In furtherance of this design I shall now proceed to place small-pox and cow-pox in contrast with each other; and thus to mark wherein the excellencies of the latter consist. This cannot be done without in some degree breaking in on the regular order of events, because the comparison would be incomplete unless the whole of the past history of

vaccination were in some measure brought to bear upon the subject. I will, therefore, first take a rapid view of the mortality attendant on small-pox, and then show by a selection of unquestionable proofs that cow-pox inoculation is perfectly capable, if duly and vigilantly practised, of accomplishing all that its benevolent inventor anticipated. It will thus be seen that vaccination has already subdued small-pox as well in extensive regions as in limited districts; and, therefore, that by proper regulations its protecting power may be made available to the whole world.

From authentic documents and accurate calculations it has been ascertained that *one* in fourteen, of all that were born, died of the small-pox. This was the calculation even after inoculation had been introduced. Of persons of all ages taken ill of the small-pox, in the natural way, one in five or six died, whilst of those who had been inoculated one only in fifty died. These conclusions were drawn by Dr. Jurin from an examination of the London bills of mortality for a period of forty-two years.

In addition to this frightful mortality, alike observable in the icy regions of Greenland; under the burning sun of Asia and Africa; and in the temperate climates of Europe, I must mention the many evil consequences which resulted from the progress of the disease, even when it did not extirpate its victims. Of those who recovered very many were permanently disfigured, or deprived of eyesight; in others, many diseases such as scrofula, chronic ophthalmia, pulmonary consumption, &c. were called

forth. Even under the most careful inoculation, and with every mitigation which art can insure, the disease is always troublesome and often dangerous; and seldom leaves the constitution without imparting a shock from which it, with difficulty, recovers.

I would hope that future ages may know this dreadful disease only as matter of history; and feeling, as I do, that the description of it by a physician may be liable to the suspicion of high colouring I subjoin one from the hand of the great and good Sir Matthew Hale. In his fourth letter to one of his grandsons, after admonishing him in his usual solemn manner regarding the feelings of piety and gratitude which his late illness ought to inspire, he thus proceeds:—

"First, therefore, touching your late sickness (small-pox) I would have you remember these particulars: 1st, The disease itself in its own nature is now become ordinarily very mortal, especially to those of your age. Look upon even the last year's general bill of mortality, you will find near two thousand dead of that disease the last year; and, had God not been very merciful to you, you might have been one of that number with as great likelihood as any of them who died of that disease. 2d. It was a contagious disease that secluded the access of your nearest relations. 3d. Your sickness surprised you upon a sudden, when you seemed to be in your full strength. 4th. Your sickness rendered you noisome to yourself and all that were about you; and a spectacle full of deformity, by the

excess of your disease beyond most that are sick thereof. 5th. It was a fierce and violent sickness; it did not only take away the common supplies of nature, as digestion, sleep, strength, but it took away your memory, your understanding, and the very sense of your own condition, or of what might be conducible to your good. All that you could do was only to make your condition more desperate, in case they that were about you had not prevented it, and taken more care for you than you did, or could for yourself. 6th. Your sickness was desperate, in so much that your symptoms and the violence of your distemper were without example; and you were in the very next degree to absolute rottenness, putrefaction, and death itself."

The inestimable discovery of the properties of the Variolæ Vaccinæ has divested this picture of all its horrors. One of these properties is that it is an affection extremely mild in its nature and affords, when it has regularly passed through its stages, as complete immunity from subsequent attacks of small-pox as that disease itself does. By this property all danger either of death or of future ill effects are removed. But the property, of all others, which peculiarly distinguishes the Variolæ Vaccinæ from small-pox, and which would enable us to banish this disease entirely, is that *they* are not communicable by effluvia.

The contagious nature of small-pox renders all attempts to mitigate its severity of little avail as regards the interests or the safety of the commu-

nity at large. The practice of inoculation, the greatest improvement ever introduced in the treatment of small-pox, although beneficial to the individual inoculated, has been detrimental to mankind in general. It has kept up a constant source of noxious infection which has more than overbalanced the advantages of individual security.

The advantages that have already arisen from the employment of the Variolæ Vaccinæ, though less extensive and complete than they might have been, are nevertheless of a magnitude so truly astonishing as to fill the mind with wonder and admiration. Of the millions of every age, condition, temperament, or constitution, who have passed through the disease I doubt if it has proved fatal in one single instance. The *alleged* fatal cases which occurred under Dr. Woodville at the Small-pox Hospital in London deserve no consideration, as these were examples of small-pox, not of cow-pox; and after the most mature examination I cannot but conclude, with the Commission for vaccination at Milan, "that if an infant does happen to die even during the course of vaccine inoculation, reason, experience, authority ought to tranquillize us; inasmuch as they sufficiently assure us that a like fate would have befallen without vaccination, which cannot bestow immortality."

How different are the sad records of small-pox! It is infinitely more destructive to human life than the plague itself. To designate its ravages, as regards the whole race of man, the eloquent Conda-

mine forcibly exclaimed, in his pleading for the adoption of variolous inoculation in France, "La petite verole nous decime." It did *more*, when it attacked a savage or half-civilized people; whole tribes were swept away. The misery of the sufferers was increased by neglect and desertion; the nearest relatives and the dearest friends fleeing from the infected, as persons doomed by divine wrath to irrevocable death.

The records of historians and travellers, from the earliest ages to the present hour, teem with dismal details of this kind. In Europe, Asia, and Africa, as well as among the native tribes in North and South America, such awful visitations were very common. In Thibet, the capital was, on an occasion of this kind, deserted by its inhabitants for three entire years; nor was it re-peopled till it was supposed to have been "purged from the pestilence."*

In Ceylon its very appearance caused whole villages to be abandoned. In the Russian empire small-pox is reported to have been so malignant as to have cut off *two millions* of inhabitants in a single year.† At Constantinople the small-pox has, in many epidemics, proved fatal to one half of those infected.

Dr. Lettsom, of London, calculated that 210,000 fall victims to it annually in Europe; Bernouilli believed that not less than fifteen millions of human

* See Turner's Embassy. Also, Mackenzie's Travels in Canada.
† See Woodville on Small-pox, p. 292.

beings are deprived of life by small-pox every twenty-five years, that is, six hundred thousand annually. This dire disease is not only universal in its ravages, but so subtle is its influence and so insidious its attack as to render it impossible to prevent its approach, or to stay its violence, save by the general adoption of vaccination. In the space of seven years it is said to have been imported more than one hundred times into the British Channel; and in the year 1800, twenty times by the Channel Fleet alone.*

It has been proved by the records of the Institution for the instruction of the indigent blind that three-fourths of the objects† relieved had lost their sight by small-pox. I have already remarked that the practice of small-pox inoculation, though it has been salutary to individuals, has been injurious to the community. In addition to what has been said on this subject I have to observe that the late Dr. Lettsom delivered in, to the Committee of the House of Commons, a document formed from the yearly bills of mortality, by which it appears that in forty-two years, between 1667 and 1722, the average number of deaths occasioned by small-pox was to the whole number who died as 72 to 1000; but that in forty-two years after inoculation came into full use, namely from the year 1731 to 1772, the proportion was no less than 89 in 1000.

Sir Gilbert Blane brought forward a calculation

* See Ring on Cow-pox, p. 687. † Moore's Reply, pp. 64, 66.

made by Dr. Heberden, stating the numbers who died of small-pox in the last thirty years of the late century as 95 in 1000, while in the first thirty years the proportion was only 70 in 1000. Sir Gilbert adds that this is perhaps much more strongly exemplified in the country than in London: since there were many parts of the country in which, previously to the practice of inoculation, small-pox was not known during periods of twenty, thirty, or even forty years, so that a great many passed through life without ever having been affected with it in any way: whereas, at present, both from inoculation and from the free and extended intercourse between the most distant parts of the united kingdom, an adult person who has not had small-pox is scarcely to be met with or heard of.

The salutary power of vaccination in controlling this dreadful mortality having been ascertained different governments adopted different modes of promoting the practice; some by authoritative statutes, others by rewards and inducements of various kinds. Sweden and Denmark adopted the first method principally; as did also many of the German States. One of the best ordinances is said to have been that of Austria in 1808. Vaccination was likewise established by law in Westphalia and Saltzburgh. The French government issued similar ordinances for the Lower Rhine, and for Illyria. The colonial governments of Spanish America acted on the same principle and, so complete was the success, that very soon after the arrival of Balmis's celebrated expedition

the small-pox was exterminated in the department of Venezuela. The same zeal was evinced in other parts of South America; and it was calculated in the year 1813 that the population of that extensive, yet thinly-peopled region, had received an annual augmentation of one million of lives, which but for the glorious discovery of Jenner would have fallen a prey to the small-pox.

The Juntas under whose direction these benevolent and judicious measures were carried on made it their business likewise to find out whether the Variolæ Vaccinæ existed among the cows in their country. After a diligent search they found it in the district of Calobozo, in the Caraccas.

Our Government in India endeavoured to entice the natives by all the arguments in their power; and it will be seen in another place that several "pious frauds" were practised by gentlemen connected with our establishments there to induce the Brahmins to give vaccination their sanction. The native inoculators were tempted by considerations of a different kind: a pecuniary reward, amounting to about five pounds sterling for every one hundred persons vaccinated, having been offered to them. It is to be feared that this allowance excited their cupidity more than their vigilance and carefulness in the practice it was intended to promote, their great object being to swell the numbers, rather than to give proper attention to the accuracy of their inoculations.

Vaccination was introduced into Vienna by Dr. De Carro, in May 1799. The effect of it was so great

that in the year 1804 only two persons died of small-pox in that city, and these two cases were imported the one from Suabia and the other from a distant village. In the year 1812 it is stated in the Report of the National Vaccine Establishment, on the authority of Drs. De Carro and Sacco, that though the mortality from small-pox was formerly more considerable in proportion to the population in Vienna and in Milan than in London, it had become unknown in the two former cities for several years: Vienna had been free from this pest for five years, and Milan for eight years.

In a letter which I received from Dr. Sacco, dated at Milan, July 13th, 1824, he confirms the preceding favourable statement. He adds "that vaccination is carried on very extensively throughout the kingdom. Almost all the new-born children are annually vaccinated, so that we have now no fear of the small-pox. It is occasionally imported from the neighbouring states of Parma, Piedmont, &c. Such occurrences never fail to prove the efficacy of the preservative, for the disease never becomes epidemic." The result of the observations and experience of this indefatigable and most successful vaccinator is contained in the following sentence, "If all governments would exert themselves to procure the regular vaccination of the children born in their states small-pox would soon disappear, and with it the new eruption."

A letter which I received from Dr. De Carro, dated August 26th, 1826, contains the following

gratifying information :—"As to the state of vaccination in Germany you may say, without entering into tedious particulars, that it is everywhere admirably conducted; that Government interferes without employing violent measures, by requiring, on every occasion, certificates of vaccination, without which no children are admitted into any school; without which they can never have any share in any public institution, nor be admitted to any religious sacraments; and without which even the burial is not regular, if they die of the small-pox.

"Nothing is so rare among us as a case of small-pox after vaccination. I do not believe that six such cases could be ascertained at Vienna: in short, vaccination has been brought to a regular system, from which very few individuals are exempted. I cannot speak so positively for other German States, but I have every reason to believe that it is everywhere as well conducted as in Austria, without any sort of medical or popular opposition."

Let us contrast these occurrences with some facts observed on a smaller scale in our own country. In the Royal Military Asylum for the children of soldiers vaccination was introduced by order of Government, at the time of its establishment in the year 1803. This institution, which contains more than eleven hundred children, from the period just mentioned to the year 1811, lost only *one* child by small-pox, and this casually arose from the child not having been vaccinated, in consequence of its mother having declared that it had had the small-pox

in infancy. In the Foundling Hospital *no death* had occurred by small-pox since the introduction of vaccination in 1801. Every public institution, I believe, throughout the kingdom, where vaccination has been steadily adopted, will afford results not less satisfactory. If the practice can accomplish such benefits in a crowded city, which is never altogether free from variolous contagion, what might it not achieve, were it employed as it ought to be? In a climate infinitely more unfavourable than England, and where small-pox used to rage with dreadful severity, the disease was extinguished by the judicious regulations for the employment of vaccination: I allude to Ceylon. Between the years 1802 and 1810, under the vigilant direction of Dr. Christie, medical superintendent-general, 128,732 persons were regularly vaccinated. The consequence was that small-pox was unknown in any part of the Island from February 1808 till October 1809, when it was introduced from Quilon on the Malabar coast. It spread to a few individuals who had not been vaccinated; but by the removal of the infected, and the employment of vaccination, the progress of the disease was instantly arrested.

In the year 1803 the Governments of Sweden and Denmark so effectually enforced the practice of vaccination that small-pox was soon extirpated from these countries. They remained free from it for nearly twenty years. It was introduced into the latter kingdom by a traveller from Ham-

burgh.* It is said that a considerable number of persons were affected with the varioloïd disease, but not one death occurred among them. At Stockholm forty-nine cases of variola appeared, of which seven proved fatal; of those who died none had been vaccinated. In the Swedish provinces sixty cases of small-pox occurred, and thirty-five of varioloïd disease; of the former twelve were fatal, of the latter not one died. It is to be hoped that these untoward occurrences will induce both Sweden and Denmark to renew their efforts to diffuse vaccination universally among their people, and again secure for them that immunity from small-pox which they had so long enjoyed. The practicability of saving mankind from the ravages of this disease has been proved by what has occurred in these countries, and in other parts of the world. They have set an example which all nations ought to follow; and surely there is no one to which the example should more forcibly speak than to our own favoured land, wherein this most salutary discovery had its origin; and from which the small-pox should long since have been banished.

The manner in which vaccination has been conducted in Anspach in Bavaria has afforded results nearly as favourable as those derived from Denmark and Sweden. One fortieth of the population is vaccinated annually. This number is supposed to include almost all the children that live to the age of six months.

* See London Medical Repository for February 1826, p. 164.

In this district, which contains upwards of 300,000 inhabitants, only four deaths occurred from small-pox in the year 1809, and from that period up to the end of the year 1818 *not one* died of that disease. This account is the more striking and satisfactory when it is considered that during the years 1814, 1815, 1816, and 1817, small-pox prevailed epidemically in every part of the contiguous state of Wirtemburgh.* It ought further to be

* The decided effects of the salutary regulations enforced in Anspach would seem to have, at length, aroused the attention of the King of Wirtemburgh to a sense of his own interest and of his people's safety.

The mortality of the four years already mentioned as occurring in his kingdom where small-pox raged epidemically, and probably the observation that during the same period the adjoining dominions of Bavaria were almost entirely free from small-pox, (five deaths only having taken place from the *casual* introduction of that disease, in the course of eleven preceding years) the King of Wirtemburgh at length issued strong enactments in the year 1818, with a view to promote vaccination. The chief regulations are as follow: "Every child must be vaccinated before it has completed its third year, under a penalty *annually* levied on its parents so long as the omission continues; and if the operation fail, it must be repeated every three months until a third trial. No person to be received into any school, college, or charitable institution; be bound apprentice to any trade; or hold any public office, who has not been vaccinated. When small-pox appears, all those liable to take it must be vaccinated without delay; and, the operation not succeeding, it must be repeated every eight days to the third time, under a penalty. The superintendence of vaccination is limited to medical men, each of whom takes charge in a given district; and a fine is levied on all who undertake to vaccinate without

added that in Anspach the deaths from small-pox in the year 1797, 1798, and 1799 were more than 500 annually, and in 1800 they actually rose to 1609.

In Prussia the deaths from small-pox before the introduction of vaccination were 40,000 annually. In the year 1817 they were under 3000, notwithstanding a considerable increase of population by an accession of territory. In the department of Breslaw, containing about 500,000 inhabitants, the small-pox was introduced in nine different places in the course of the year 1818. By insulating all who fell sick, and by the extensive employment of vaccination, the progress of the disease was immediately arrested; only twenty-eight persons caught it; but of these, six died. *

Dr. Casper has shown that since the general introduction of the cow-pox the mortality among children has been very much diminished; and this diminution

being duly qualified. The name of every child is to be enregistered the day after its birth; and if it die before vaccination, notice must be given. Provision is made for a supply of fresh ichor annually from the cow: and for vaccinating from *arm to arm*, the parties being recompensed for the time thus taken up. Variolous inoculation is prohibited when small-pox is not present; and when it is, the practice can only be done by a medical man, and under proper precautions of seclusion, &c., to prevent the disease from spreading: all expenses incident to the *isolation* and care of variolous patients, whether the disease has been taken by contagion or inoculation, is to be borne by the parents, unless the individual had previously gone through the cow-pox, or been *thrice* vaccinated without effect."

* See Cross on the Variolous Epidemic, pp. 244, 245.

has not been gained at the expense of an increased mortality from other diseases.

According to the researches of Black, Lüssmileh, and Frank, eight or nine per cent. of the human race were carried off by small-pox. Duvillard endeavoured to show that of 100 persons, only four reached the age of thirty years without having it; that one in seven or eight, who were affected, died; and that of those who were attacked in infancy only two-thirds escaped.

The effect of vaccination is clear and distinct, and is admirably exhibited in Prussia, which seems to have got the start of most other European kingdoms. In the French empire 12,857 persons died of small-pox in 1818 and 1819, which in a population of fifty-four millions gives one in every 4518; whilst in Prussia, in 1820 and 1821, the deaths from small-pox were 3137, which in a population of twenty-three millions, gives one in every 7204.

In Berlin alone, the average number of deaths for the twenty years immediately preceding the general introduction of vaccination in 1802, was 472—for the twenty years following, it was diminished to 175, although during that period the disease had been several times epidemic. Since the founding of the vaccine establishment in 1812, the annual mortality from small-pox has decreased to fifty; since 1817 it has been only twelve—and in 1821 and 1822 there was only one death each year. In 1823, during which year Hüfeland considers the small-pox to have been *epidemic* in Prussia, the *cases* of that disease in Berlin were 200, and five died; and he contrasts

these numbers with those in the last epidemic, before the general introduction of the cow-pox, namely in 1801, when 16,000 were affected with small-pox, and of these 1646 died.

It is a lamentable fact that, notwithstanding these cheering and irresistible proofs of the virtues of vaccination, we should still have to record the dreadful ravages of small-pox in some of the most civilized countries of Europe; and with shame and sorrow be it said that England stands conspicuous among the number.

Small-pox was nearly as prevalent in London in the year 1825 as during any of the three great epidemics of the preceding century. The admissions into the hospital were more numerous than in any year since 1796, when, according to the bills of mortality, 3549 died of small-pox.

The numbers admitted into the Small-pox Hospital have only been exceeded on two other occasions during the last half-century, namely in the years 1777 and 1781, when the deaths, according to the bills of mortality, were 2567, and 3500 respectively.

In contemplating this very painful statement it is some consolation to know that vaccination, though it had not been permitted to effect all the good that it might have accomplished, has nevertheless been of signal benefit in staying the pestilence. Twelve hundred and ninety-nine persons perished in London, in twelve months; and that, too, after the means of eradicating this plague had been in the hands of the public for twenty-seven years. The physician, from

whose report I am quoting these facts, supposes that, frightful as this mortality is, it probably would have amounted (taking into account the increased size of the town) to at least 4000, but for the employment of vaccination.

The proof that vaccination could do so much must fill every rightly-disposed mind with grief that it had not been *so* employed as to prevent altogether this waste of human life. This feeling is augmented when we consider that in the year 1824 the number of deaths was reduced to 725; and in 1818 they were only 421.

In another part of his report Dr. Gregory mentions that, during the last year, 419 persons were admitted into the Small-pox Hospital. Two hundred and sixty-three took the disease in the natural way without previous protection, of whom 107 died. Two had it subsequent to variolous inoculation, of whom one died; and 147 had small-pox, after real or presumed vaccination, of whom twelve died.

The latter part of this alarming statement attracted the notice of Mr. Secretary Peel, who issued orders to the board of the National Vaccine Establishment to consider the alleged fact of twelve deaths from small-pox after vaccination, as stated in the report of the physician to the Small-pox Hospital. The result of this examination was so satisfactory, as it regards the Variolæ Vaccinæ, as to leave no

cause to doubt that these individuals had not been properly vaccinated.*

Vaccination seems ever to have been fated to suffer more in character from events within the walls of the Small-pox Hospital than from any other quarter: its atmosphere has always been unfriendly to the benign influence of Vaccina; but I trust that the inquiry which has taken place will counteract the ill effects that might have arisen had the statement of the physician remained unexplained. I hope it will not be thought out of place if I express an ardent wish that my professional brethren may be slow to publish fatal or other cases of small-pox after vaccination, until they have good grounds for believing that their patients had regularly and duly passed through the protecting process; and surely there is no reason to think that this had taken place in any of the fatal instances reported by Dr. Gregory; as a reference to his examination will fully evince.

It appears that the deaths from small-pox in Paris during the last year amounted to 1264.

In the twelfth arrondissement during October last it was found by M. Devilliers that of 215 deaths in private houses 91 were from small-pox, and none of these individuals had been vaccinated.

* See the letter of Sir Henry Halford, Bart. to H. Hobhouse, Esq. Under Secretary of State.—Medical and Physical Journal for May, 1826, pp. 436 and 7.

Those who *had* been, associated with impunity with the persons affected by small-pox; and in those establishments where no persons are admitted who have not been vaccinated the small-pox did not occur.

It appears from the report of the Committee of Vaccination presented to the Minister of the interior of France, in 1811, that from the 4th April 1804 to the end of 1811, the number of individuals vaccinated amounted to 2,300,937. This did not include the numbers vaccinated from the first establishment of the Central Committee, on the 11th May 1800; nor those which have occurred in private practice. The Minister of the interior, in his address introductory to the report itself, made the following striking declaration; he asserted that 1,400,000 children were annually born in the French empire; that formerly one million passed through the small-pox in that period, of whom 150,000 perished. In the year 1811 there were only 70,000 cases of small-pox, and of these 8500 died. Thus, he observes, nearly 150,000 lives are preserved annually to the empire; and a number at least as large snatched from the evils which follow small-pox.

From the documents furnished by the *Provincial* Vaccine Institutions throughout France by order of Government, a report was drawn up soon after this period by M. M. Berthollet, Perce, and Halle (in 1812) in which it is affirmed that of 2,671,662 persons *properly* vaccinated in France, only seven

cases of subsequent small-pox appear, i. e. one in 381,666; and it is stated that well authenticated instances of *secondary* small-pox occurring after complete small-pox inoculation are *proportionally far* more *numerous:* and this report adds that in Geneva, Rouen, and several other large cities where the Jennerian method was fully adopted, small-pox is no longer known.

I do not know whether the vaccinations have continued to increase in France, but I rather fear that they have not. In 1811, the births are reported at 1,196,111. Vaccinations 702,218. The number of persons who had the small-pox is 68,711, of whom were disfigured or injured 4436; and died 8377. The report for the years 1821 and 1822 gives the following numbers, births 1,213,082; vaccinations 681,331; persons affected with small-pox 30,480; deaths from small-pox 6538; disfigured or injured by it 2432.

In consequence of the difference of the time, as well as of the number of departments referred to in the preceding reports, it is impossible to determine the relative proportion of vaccinations during the two periods; one fact, however, may be ascertained which seems to prove that vaccination has rather receded than advanced. In the first mentioned period the vaccinations were to the births as more than 3 to 5, in the last they were only as 5 to 9.

The influence of Variolæ Vacinæ on population has not yet been so clearly elucidated as the impor-

tance of the subject demands. It has recently attracted the attention of the Institute of France, and that learned body requested M. B. de Chateauneuf to inquire into it. He states in his memoir that the mortality in France among children is much less at present than it was in the last century, particularly from the time of birth to the age of five years. Before the introduction of vaccination the deaths within this range were in the proportion of 50 in 100. Since the introduction of vaccination the proportion has been reduced to 37 in 100. The number of children vaccinated since 1811, throughout France, has not risen above three-fifths, and in the capital it has only amounted to a seventh.* This neglect of the practice fully accounts for the great mortality from small-pox in Paris during the last year.

This part of the subject cannot be better concluded than in the words used by the Commission appointed (in 1825) by the Royal Academy of Medicine of Paris to examine into the state of vaccination.

"Is it reasonable to expect more protection from the vaccine than from small-pox itself?

"Let those who doubt the *efficaciousness* of cow-pox compare the small number of such as are said to have been attacked by small-pox after vaccination, with the important mass of twelve or fifteen millions vaccinated in France within the last five-and-twenty years, and who have altogether escaped from small-

* See Christian Observer, for January 1826.

pox; then must the instances of *secondary* attack appear as slight *exceptions* to a *general* rule. But an irrefragable proof of the preservative powers of the vaccine is to be found in the great public establishments of France, into which no person is received except such as bring with them a certificate of having had either small-pox or cow-pox. Into these establishments Variola has never made its way, as, for instance, the Polytechnic School, St. Cyr, Facultés de Droit et de Medecine, the different colleges of Paris, the Pensionnats de St. Denis, de Saint Germain. These different institutions, situated for the most part in the very midst of contagion, what could have preserved them unless vaccination?"

It appears to have been proved by the most incontrovertible evidence that the Variolæ Vaccinæ, as Dr. Jenner always maintained, are the mild species of small-pox. From this fact it is evident that the same general laws must govern both affections; and that, if there are different degrees of protection afforded by small-pox itself, similar gradations must be looked for in the protecting power of the Variolæ Vaccinæ. When Dr. Jenner published his "Inquiry" it had escaped the attention of medical men that small-pox occurred a second time as frequently as it has been proved to do, both by recent experience and past history. This mistake led, perhaps, to a too confident statement of the never-failing efficacy of vaccination; but after the most mature examination it cannot be doubted that this process, when

duly gone through, does certainly afford as complete immunity from subsequent attacks of small-pox, as that disease itself can do. Indeed, if I were to be guided by my experience in this district, I would say that cases of failure have been so rare as to justify even a stronger statement of the protecting qualities of cow-pox: and it ought ever to be remembered, (in the words of Mr. Bryce*) "that there are on record more instances of persons suffering severely, nay fatally, from what was considered to be a second attack of small-pox, than from small-pox after what has been considered perfect vaccination."

The more the whole of this subject is considered and scrutinized the more needful it will appear to attend to all the minute peculiarities connected with the character of Variolæ Vaccinæ; and to obtain full assurance that they take place whenever we attempt to propagate that affection by inoculation.

These observations are introductory to a short consideration of the occurrences which happened during the varioloïd epidemics already alluded to, that have recently prevailed in different parts of Great Britain and on the Continent, and which may be supposed to modify the preceding estimate of the virtues of vaccination.

It is not my design to enter upon the nosological question which has been agitated in Edinburgh with regard to these diseases. I cannot, however, but feel that the discussion intended to elucidate the

* See his letter, in Thomson on Varioloïd Diseases, p. 86.

natural and literary history of *variolous diseases*, together with the opinions entertained by Dr. Jenner, *does* forcibly lead to conclusions similar to those which have been so ably stated by Dr. Thomson.

It is agreed on all hands that the eruptive disease, which appeared in Edinburgh and other parts of Scotland, was produced by the contagion of true small-pox. When it occurred in those who had been vaccinated, it, in general, put on that modified character which is described by Dr. Willan* and, in short, resembled the disease which had been excited by that physician and by Dr. Woodville, when they inoculated with the matter of small-pox and cow-pox at the same time.

Its variolous origin is further proved by the following circumstances. The disease was produced in persons previously vaccinated by inoculating with true small-pox matter, and inoculation with matter from the modified disease in many cases produced regular small-pox in those who had not been vaccinated.

During this epidemic Dr. Thomson saw from June 1818, to December 1819, 556 cases. These he distributes into three classes. Of the first, 205 had neither small-pox nor cow-pox previously. Of the second, 41 had gone through the small-pox. Of the third, 310 had been vaccinated.

Of the first class 50 died, or nearly one in 4.

Of the 41 of the second class, which he himself

* See Willan on Vaccine Inoculation, p. 50.

saw, together with 30 others communicated by friends, in all 71, 3 died; one in 23 nearly.

Of the third class, one is reported to have died. The account of this case in the Edinburgh Medical and Surgical Journal for 1820 is somewhat different from that given by Dr. Thomson. It is there represented as an anomalous case, not of small-pox, but of peculiarly aggravated chicken-pox. It is, moreover, right to remark that the proofs of correct vaccination are not stated by Dr. Thomson.

I shall have another opportunity of stating Dr. Jenner's opinions on these occurrences; in the mean time the following sentences from Dr. Thomson's work deserve to be brought forward in this place. "It has been impossible to see the general mildness of the varioloïd epidemic in those who had undergone the process of vaccination, and the severity, malignity, and fatality of the same disease in the unvaccinated, and not to be convinced of the great and salutary powers of cow-pox in modifying the small-pox in those who were afterwards affected with this disease. Proofs cannot be imagined more convincing and satisfactory of the efficacy of the practice of vaccination and of the incalculable benefits bestowed upon mankind by its discoverer, than those I have had the pleasure of witnessing."*

Events similar to those which took place in Edinburgh happened at Millau near Montpelier in France, in the year 1817. M. Paugens, physician

* See Thomson on Varioloïd Epidemic, pp. 40, 108, 111.

there, produced in one child distinct, and in another, confluent small-pox, by inoculating with matter taken from eruptions in two other children, which eruptions he believed not to be chicken-pox, as some supposed, but small-pox rendered mild by previous vaccination. But whatever may have been the nature of this epidemic it did not prove fatal to a single individual who had undergone vaccination, though it carried off more than 200 unvaccinated children. According to M. Fonteneille's account, of 290 persons attacked with this disease at Millau, 55 died; almost all who recovered were deeply marked; and several lost their sight.

In the fatal epidemic which raged at Norwich in the year 1819, and which has been so accurately and ably described by Mr. Cross, he kept a regular register of the effects produced by the contagion in 112 families comprehending 603 persons. Of these, 297 had previously had small-pox, all of whom escaped; 91 had been vaccinated, of whom all, excepting 2 who had a mild affection, and one who had chicken-pox, were protected. *200 who had neither had cow-pox nor small-pox took the latter; and 15 others who were in the same situation resisted the contagion altogether. It was proved,

* The protecting power of vaccination is very strongly evinced on a comparison of the event in these 200 cases with that which took place in the 91 vaccinated individuals, all of whom, save two, entirely resisted the variolous contagion to which they were exposed; and which it is evident was of the most virulent kind, from the registered statement of the 200

nevertheless, in the same epidemic that in several instances adults caught the small-pox who had at various times resisted the intimate and continued exposure to the contagion of that disease. He mentions two clear cases of regular small-pox, the one after the natural, the other after the inoculated disease. He also met with a few cases of modified small-pox subsequent to small-pox. His correspondents informed him of many cases of secondary small-pox, three of which are stated to have been fatal.

With a view to ascertain the protecting power of vaccination Mr. Cross searched for alleged cases of failure in every quarter of the city, and spared no pains in examining all such reports to the bottom. He found, in all, six cases wherein small-pox ran its usual course in persons who had been vaccinated. The progress of the cow-pox had been watched by medical men; all the cases save one had the usual cicatrix. Of these, two proved fatal; the one, being a confluent disease, on the eleventh day; the other on the eighth day, the pustules being intermix-

cases of small-pox occurring in the same families, with whom they were intermixed; thus given by Mr. Cross:—

Cases of small-pox, in 112 families.

Mild	75	
Severe	78	
Confluent	42	46 deaths.
Petechial	5	
	200	

Vaccinated persons 91, of whom 2 had mild small-pox, one had chicken-pox. No death occurred.

ed with many petechiæ. His conclusion upon the whole is that such fatal cases ought to have no weight against the practice of vaccination, when it is considered that 530 deaths occurred among a little more than 3000 persons who had not been vaccinated; whilst of 10,000 who had been vaccinated, and lived in the midst of a contaminated atmosphere, an immense proportion escaped all illness, a very small number only having eruptive complaints. It is also to be observed that regular and fatal small-pox had occasionally been met with in those who formerly had had that disease.

Facts such as are above recorded, when they are observed on a great scale, necessarily arrest the attention of medical men as well as of the public. Had Dr. Jenner's observations been as much regarded as their importance required many of these untoward events might have been foreseen and, possibly, prevented. So early as the year 1799, he had ascertained by the clearest evidence some of those points which the late fatal epidemics have confirmed. He showed, in the first place, that the constitution cannot by previous infection be rendered totally unsusceptible of the variolous poison.

In the next place he proved that by inoculating a person who had gone through the cow-pox, with variolous matter, it was possible to excite a local vesication from which virus was obtained capable of producing a mild, but efficacious, small-pox. He further maintained in his tracton the varieties and

modifications of the vaccine pustule, that these varieties were such as to produce "every gradation in the state of the pustule from that slight deviation from perfection, which is quite immaterial, up to that point which affords no security at all." In this paper he republished some of his observations on the characters of the pustules taken from his instructions for vaccine inoculation. He afterwards adds that fluid taken from a spurious vaccine pustule can propagate and perpetuate its like, and, even if it be taken from a genuine pustule in its far-advanced stages, it is capable of producing varieties which will be permanent if we continue to employ it.

The deviations to which the remarks in this paper chiefly refer are those occasioned by the herpetic state of the skin; but every deviation, from whatever cause it may have arisen, was considered by him of the greatest moment; and in all his published works, as well as in every private communication, he never failed to express his deep sense of the importance of the most scrupulous attention to that subject; and to the last he felt (and, I believe, most truly) that had his admonitions been received as they ought, had the phenomena connected with vaccine inoculation been studied by all who conducted the practice, a large portion of the failures would have been avoided. The following passages published twenty years ago express so forcibly these sentiments that I cannot withhold them; and now that their author is no more they may perhaps obtain greater notice than when he was among us.

"I shall conclude this paper by observing, that although vaccine inoculation does not inflict a severe disease but, on the contrary, produces a mild affection scarcely meriting the term *disease*, yet, nevertheless, the inoculator should be extremely careful to obtain a just and clear conception of this important branch of medical science. He should not only be acquainted with the laws and agencies of the vaccine virus on the constitution, but with those of the variolous also, as they often interfere with each other. A general knowledge of the subject is not sufficient to enable or to warrant a person to practise vaccine inoculation: he should possess a particular knowledge; and that which I would wish strongly to inculcate, as the great foundation of the whole, is an intimate acquaintance with the character of the true and genuine vaccine pustule. The spurious pustule would then be readily detected, whatever form it might assume; and errors known no more." *

It may not be without its use to connect the events which occurred in recent varioloïd epidemics with those which occurred at the commencement of vaccination. In London, at Petworth, Geneva, and Marblehead in the United States, a series of events took place illustrative of the disasters that arose out of inattention to Dr. Jenner's rules. The matter used at Petworth came originally from the Small-pox Hospital. It was employed in fourteen cases:

* See "Varieties and Modifications of the Vaccine Pustule." p. 13.

variolous eruptions were the result. The disease did not prove fatal in any of the inoculated; but an elderly woman who attended on them caught the disease and died. Her husband was affected by her, but recovered after severe suffering. In this history we have an epitome of what took place in some of the varioloïd epidemics. The vaccine virus sent from London was mingled with that of small-pox. This combination modified the small-pox in those who were inoculated, and produced a comparatively mild disease; but when it was communicated by effluvia to others the variolous affection predominated and assumed its worst character. This I take to be quite analogous to what happened when persons previously vaccinated caught the small-pox or varioloïd disease. In such it became modified and mild; but in those who had never felt vaccine influence it assumed when propagated, whether by inoculation or by effluvia, its most malignant form.

The disasters at Geneva and Marblehead were of a different kind. They arose from employing spurious matter. The disease excited in both instances had nothing of the true vaccine character, and afforded no protection to those to whom it was communicated. Who can tell how many of the alleged cases of small-pox after vaccination may not have been of this description?

It were easy to add numberless facts to those which have been accumulated in this chapter. But they all speak one language. Let Vaccination be effectively and universally employed and Small-pox

must disappear; and with it, as Dr. Sacco says, "the new eruptions." They are only met with when small-pox has been permitted to show itself because vaccination has either been neglected, or partially and insufficiently performed.

The experience of the public institutions in Paris and London is quite conclusive on this point. The same fact is equally capable of proof whether we appeal to small districts, or to large kingdoms. There are many country parishes in England from which small-pox has been entirely excluded ever since the general employment of vaccination, even though the disease was prevalent in their immediate vicinity. In such situations both variola and varioloïd eruptions have been unknown.

Shall not these unquestionable statements arouse the attention of the community to secure all the blessings that are placed within its reach? Small-pox inoculation, I believe, is now abandoned by almost every respectable medical man. In the country it has fallen into the hands of the lowest and most illiterate of the people. Surely this ought not to be suffered. If qualifications are required for selling or dispensing medicines, the power to disseminate a poison, whose influence is not and cannot be confined to the individual who receives it, but may carry destruction through a whole district, ought not, certainly, to be left at the disposal of every ignorant person whose prejudice or cupidity may prompt him thus to sport with the lives of his fellow-creatures.

CHAPTER IX.

LIFE, AFTER THE PUBLICATION OF THE "INQUIRY," TO 1800. DISASTERS AT THE SMALL-POX HOSPITAL, AT PETWORTH, &c.

In endeavouring to elucidate and confirm the opinions of Dr. Jenner, and to demonstrate the salutary power of vaccination, we have been carried away from his personal history, and been obliged to deviate from the regular succession of events that took place subsequent to the publication of his *Inquiry*. The first opposition which he encountered, after this event, came from a quarter that might have caused misgivings in the mind of any one who was not thoroughly convinced that both his facts and reasonings were fitted to stand the test of the severest scrutiny. The celebrated Dr. Ingenhousz, distinguished both as a man of science and as a physician, came to visit the Marquess of Lansdown at his seat in Wiltshire, soon after the publication of the Inquiry. On the 12th of October, 1798, he addressed a long letter to Jenner on the subject of that work.

It is written respectfully, but at the same time with a degree of pomp and authority scarcely even befitting one who could subscribe himself Physician to the Emperor and King. He had made it his business to inquire among the dairies of Wiltshire, where cow-pox sometimes prevailed, respecting its reported virtues as a preventive of small-pox; and he got, as might have been expected, such answers as Dr. Jenner had obtained at the commencement of his investigation. Some individuals, who had had what was called cow-pox, were subsequently affected with small-pox; and therefore, he said, all the security which you promise from the inoculation of the former is so neutralized by this testimony that you had better confess that you have been in error, and prevent the disappointment which must follow from ungratified expectations.

Jenner's discussions with his professional brethren at Alveston had fully enabled him to meet this objection; and the different steps in the investigation, by which he had proved when protection was to be expected and when it was not, had so completely armed his own mind against assaults of this nature that he had nothing to fear in the encounter. The station and character of such a man as Ingenhousz was nevertheless not to be neglected. He had made small-pox his particular study, and had been employed in inoculating some of the Imperial family of Vienna as well as of the Grand Duke of Tuscany, with this disease. Jenner pointed out to him in the

most becoming manner the source of his misapprehension—that he had met with individuals who had confounded the spurious affection which sometimes appears on the hands of the milkers, and which affords no security at all, with that genuine and regular pustule which, when not disturbed in its course, gives the most perfect exemption from the attacks of small-pox.

As the early letters on this subject must have a peculiar interest, and will convey a better idea of the state of feeling than any description of mine, I will now, as on other occasions, illustrate my narrative by reference to documents of that kind.

DR. INGENHOUSZ TO DR. JENNER.

SIR,

Having read with attention your performance on the Variolæ Vaccinæ, and being informed by every one who knows you that you enjoy a high and well-deserved reputation as a man of great learning in your profession, you cannot take it amiss if I take the liberty to communicate to you a fact well deserving your attention, and with which you ought to be made acquainted. I prefer this private method of conveying my information to any other which might expose you to the disagreeable necessity of entering into a public controversy, always disagreeable to a man so liberal-minded and well intentioned as your treatise indicates you to be.

As soon as I arrived at the seat of the Marquess of Lansdown, Bowood, near Calne, I thought it my duty to inquire concerning the extraordinary doctrine contained in

your publication, as I knew the cow-pox was well known in this country. The first gentleman to whom I addressed myself was Mr. Alsop, an eminent practitioner at Calne. This gentleman made me acquainted with Mr. Henry Stiles, a respectable farmer at Whitley, near Calne, who, thirty years ago, bought a cow at a fair, which he found to be infected with what he called the cow-pox. This cow soon infected the whole dairy; and he himself, by milking the infected cow, caught the disease which you describe, and that in a very severe way, accompanied with pain, stiffness, and swelling in the axillary glands. Being recovered from the disease, and all the sores dried, he was inoculated for the small-pox by Mr. Alsop. The disease took place: a great many small-pox came out, and he communicated the infection to his father, who died of it. This being an incontrovertible fact, of which I obtained the knowledge from the very first man to whom I addressed myself, cannot fail to make some impression on your mind, and excite you to inquire farther on the subject, before you venture finally to decide in favour of a doctrine, which may do great mischief should it prove erroneous.

I heard of several other facts of a similar nature which tend to contradict your doctrine; but, indeed, it was added that the cow-pox had not been severe enough to extinguish the susceptibility to the small-pox.

The above-mentioned farmer thought that the disease of the cow called cow-pox spreads through a dairy in the way of other contagious diseases. The very offensive stench, which those sick cows give out from the lungs and the udder seems to indicate that the disease spreads by infection, without the interference of the milker's hands, or the *grease* of the horse's feet.

Thomas White, an eminent farrier in the neighbourhood of Calne, was of the same opinion.

By inquiring more minutely on what is asserted in page 56–57, you will, I make no doubt, find it erroneous. But I will make no farther observations, as it is far from my wish or my intention to enter into any controversy with a man of whom I have conceived a very high opinion. Let it suffice to have communicated to you, in a friendly way, a fact which may awaken your attention.

I am, with every possible sentiment of esteem,

Sir,

Your obedient humble servant,

J. Ingenhousz, Physician to the Emperor and King.

Bowood Park,
Oct. 12*th*. 1798.

Dr. Jenner to Dr. Ingenhousz.

Dear Sir,

I shall ever consider myself as under great obligations to you, for the very liberal manner in which you have communicated a fact to me on a subject in which at present I feel myself deeply interested; a subject of so momentous a nature that I am happy to find it has attracted the attention of some of the first medical philosophers of the present age, among whom it is no compliment in me to say that I have long classed you.

It will doubtless, in the course of time, meet with a full investigation; but as that moves on (and from the nature of the inquiry it must move slowly) I plainly foresee that many doubts will arise respecting the validity of my assertion, from causes which ought to be examined with the

nicest inspection before their convictive force be fully admitted.

Truth, believe me, Sir, in this and every other physiological investigation which has occupied my attention, has ever been the object which I have endeavoured to hold in view. In the publication on the Variolæ Vaccinæ, I have given little more than a simple detail of facts which came under my own inspection, and to the public I stand pledged for its veracity. In the course of the inquiry, which occupied no inconsiderable portion of my time and attention, not a single instance occurred of a person's having the disease, either casually or from inoculation, who on subsequent exposure to variolous contagion received the infection of the small-pox, unless that inserted in page 71 may be admitted as an exception. And from the information you have given me, and from what I have obtained from others who have perused the pamphlet, I am induced to suppose that my conjecture respecting the cause of that patient's insecurity, namely, her having had the disease without any apparent affection of the system, might have been erroneous; and that the consequences might be more fairly attributable to a cause on which I shall, in my present address to you, feel it my duty to speak explicitly. 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 strangle it at once than suffer it to exist, and do a public injury. At present I have not the most distant doubt that any person, who has once felt the influence of perfect cow-pox matter, would ever be susceptible of that of the small-pox. But on the contrary, I perceive that after a disease has been excited by the matter of cow-pox in an imperfect state, the specific change of the constitution necessary to render the contagion of the small pox inert is not produced,

and in this point of view, as in most others, there is a close analogy between the propagation of the cow-pox and the small-pox. Therefore I conceive it would be prudent, until further inquiry has thrown every light on the subject which it is capable of receiving, that (like those who were the objects of my experiments) all should be subjected to the test of variolous matter who have been inoculated for the cow-pox.

(The remainder of this letter is lost.)

This very mild and satisfactory letter by no means produced the effect that might have been expected on the mind of the imperial physician.

In the same proportion as Jenner was diffident and conciliatory, *he* became rude and truly imperious; resisted every explanation that was given; contended with increasing obstinacy for the accuracy of his own assertions; and, of course, became more and more convinced of what he deemed the errors of Jenner.

It will easily be believed that the reiteration of such sentiments could not fail to be disagreeable to Dr. Jenner. He soon, however, formed a proper estimate of the character of his correspondent. At first he evidently felt a degree of anxiety concerning the result of the conflict with such an opponent; but he met all the attacks with perfect good temper, till the haughtiness and self-sufficiency of his antagonist put an end to all further intercourse. He had sent another long explanatory letter to Dr. Ingenhousz, and proposed, in order to do away all appearance of

shrinking from an exposure of their correspondence, that this letter should be printed, and be considered as an appendix to the Inquiry. The following letters refer to this incident:—

DR. JENNER TO MR. EDW. GARDNER.

Berkeley.

DEAR GARDNER,

We wondered at Ingenhousz's delay in answering my letters, particularly the long one that you inspected. A tempest is generally preceded by a calm. He has in some measure exemplified the remark. I know not what to do with him, and wish for your advice, after you have seen his letter. It is a matter of real moment; a matter on which perhaps much of my future peace may rest—indeed, my existence. I sometimes think that it would be most prudent to desire him to make public all he knows of the cow-pox; but would there not, in this measure, be a sort of defiance that might irritate? The grand question at present to be determined is this—shall I immediately publish an appendix, or say nothing till every bolt is flung, and then attack my adversaries?

This very man, Ingenhousz, knows no more of the real nature of the cow-pox than Master Selwyn does of Greek: yet he is among philosophers what Johnson was among the literati, and, by the way, not unlike him in figure. 'Tis no use to shoot straws at an eagle. When shall I see you?

Yours, sincerely,

E. J.

Dr. Jenner to Mr. Edw. Gardner.

Dear Gardner,

I fully depend upon meeting you at Eastington to-morrow to sit in council on several subjects of high import. My friends must not desert me now. Brickbats and hostile weapons of every sort are flying thick around me; but with a very little aid, a few friendly opiates seasonably administered, they will do me no injury.

Ingenhousz has declined my offer of receiving my letter in print—so that must be modelled anew. We must set off by impressing the idea that there will be no end to cavil and controversy until it be defined with precision what is, and what is not cow-pox.

The *true* has many imitations by the *false* on the cow's udder and nipples; and all is called *cow-pox*, whether on the cow or communicated to the human animal.

My experiments move on—but I have all to do single-handed. Not the least assistance from a quarter where I had the most right to expect it ! !

Bodily labour I disregard, but pressures of the mind grow too heavy for me. Added to all my other cares, I am touched hard with the reigning epidemic—Impecuniosity.—Any supplies from the paper-maker?

Adieu !

Your faithful friend,

Wednesday morning. E. J.

You must be more attentive to me than you were during the last Cheltenham recess. I believe you came here only once, and then in your way from Bristol.

Dr. Jenner sent also one of his friends who was well acquainted with vaccination to endeavour by personal explanation to remove Dr. Ingenhousz's misconceptions. An amusing account of that interview is contained in this letter.

T. Paytherus, Esq. to Dr. Jenner.

December 14*th*, 1798.

Dear Jenner,

The moment I received your letter I called on Dr. Ingenhousz; he was in the country, but expected in town the next day. Yesterday I called a second time and made an appointment for this morning, in consequence of which I have had an interview with this very interesting character.

A more determined or a more formidable opponent you need not covet or desire. Unfortunately for your hypothesis, he made his first inquiry of a Mr. Alsop, of Calne, who immediately named a person who had had the small-pox after the cow-pox. This person he was afterwards introduced to and satisfied himself of the *fact*. The second application was to Major General Hastings: he also pointed out an instance of the small-pox subsequent to the cow-pox, at Adlestrop.

Dr. Garthshore has also at Dr. Ingenhousz's request written to Dr. Pulteney, of Blandford, who in reply has assured him that the inoculators of his neighbourhood have known many instances of the small-pox happening after the cow-pox. He believes that it does in many instances produce that change in the human constitution as to render it unsusceptible of the small-pox, but not with certainty in *all* cases. He would not hear a word in defence of your opinion respecting its origin.

He is confident that a spurious small-pox cannot be pro-

duced by what you call putrescent variolous matter, and that whether the matter be kept in a wet sponge, or on cotton, either in a moist or a dry state, it will uniformly produce the small-pox. Yet he confessed in his own practice that the dried matter more generally produced a confluent small-pox. In your last letter to him you speak of the putrescent state of the cow-pox matter, and that the milk might likewise undergo a similar change. To this he objects, and says that milk will become acescent, not putrescent.

That it should render the habit unsusceptible of small-pox, and not of its own specific action, is to him incredible. You tell him in one of your letters that you have heard from Adlestrop, and that the father of the boy or girl now thinks that the small-pox preceded the cow-pox. To *think*, it seems is to *doubt*, and he says the ambiguity on the part of the father confirms the first statement instead of weakening it. His respect for your character has kept him from publishing, and he declines entering into controversy with you. Had you been a less formidable antagonist he would have flogged you long since. He spoke very handsomely of you, and desired me to assure you that nothing would have kept him from answering your letters but the desire of satisfying his mind on the subject. He desires that you will not be in haste to publish a second time on the cow-pox, but wait till you have collected a sufficient number of facts, and to secure your ground as you advance. He remarked that you would not be permitted to be judge in your own cause; that you were now before the tribunal of the public, and so long as *sub judice lis est*, you ought not to risk an opinion.

* * * * *

Instead of printing his letters to Dr. Ingenhousz in

the form of an Appendix to the *Inquiry*, as he had proposed, he determined to give them another shape, and published on the 5th of April, 1799, "Further Observations on the Variolæ Vaccinæ." The reader will see at page 3, a pleasing illustration of the spirit in which all his researches were conducted. The same sentiment will be found in his private letter to Dr. Ingenhousz.

"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 first 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."

The effect of Mr. Cline's successful vaccination in London, after Dr. Jenner had left the metropolis, was strongly manifested by an increased degree of attention on the part of the men of science. Many of the most distinguished, while they gave all due confidence to the statements of Jenner, waited with becoming prudence till additional experience should either confirm or refute the very remarkable phenomena which they had been called on to consider.

Others, with little wisdom, precipitately adventured into a field of investigation of which they had no knowledge but what they derived from Dr. Jenner himself; and on mere speculation questioned the

accuracy of his details, and denied the cogency of his reasoning.

The gentlemen who distinguished themselves in this manner proceeded at the outset, at least in their intercourse with Dr. Jenner, with much apparent respect and candour. Their main object seemed to be to further the advancement of truth; and to second him in his benevolent purpose. Such unquestionably was the feeling with which he regarded their efforts. He welcomed them as valuable coadjutors in his great cause, and he continued to do so till proceedings, the character of which could not be mistaken, compelled him reluctantly to discover qualities that but ill assorted with these anticipations. Were it not that some circumstances of great consequence to himself and to the cause of vaccination were involved in the events which I am now about to mention, I would gladly pass them by without any notice.

Having concluded his correspondence with Dr. Ingenhousz he soon encountered other opponents. His opinion with respect to the origin of the Variolæ Vaccinæ in an especial manner drew forth the animadversions of his contemporaries. It was received with derision by some, and with suspicion and distrust by almost all. This is not the only instance in which he had the misfortune to shoot above the heads of his brethren; and to have doctrines treated as conjectural and ridiculous, of the truth of which

he had satisfied himself by rigid and patient inquiry. The whole history of his labours on the subject of vaccination, as already set forth in this work, affords pregnant illustrations of this observation.

Some grave and learned persons doubted all the assertions contained in the *Inquiry;* and, of course, set no value on the reasoning connected with them. Others thought that there was truth in the reported prophylactic virtues of cow-pox, but that Jenner had no more merit than was due to the publisher of a fact long known, though buried in provincial obscurity; that all the information respecting the laws of this singular affection remained to be discovered; and that his opinions on such high matters merited little consideration. Thus, under the head of those who refused assent to his positions altogether, or of those who questioned the accuracy of his information and the fidelity of his descriptions, may be arranged all the active detractors, who zealously bestirred themselves to overthrow Dr. Jenner's pretensions, either by direct contradiction, or by faithless and insidious efforts to reduce his merits as a discoverer, even while their mouths were filled with ardent professions of gratitude and admiration.

It will appear in the sequel that vaccination incurred much greater risk from the latter than from the former. The apparent candour of their proceedings; their eagerness and zeal in the cause; and the respectability of their professional character lent an authority to their statements to which they

were by no means entitled; and moreover gave a temporary countenance to errors both in doctrine and in practice, which doubtless would have proved fatal to vaccination had not Jenner placed it on a foundation that could not be shaken. The ordeal which tried both the firmness and patience of his character, and the accuracy and faithfulness of his most minute details was brought into full and inquisitorial activity very soon after the publication of the *Inquiry*, and to that subject we must now direct our attention.

Dr. Jenner remained chiefly at Cheltenham and Berkeley from the time of his leaving London in July 1798, till the following February. During this period he was most assiduously employed in collecting additional information respecting the Variolæ Vaccinæ; and in carrying on an extensive correspondence with medical gentlemen in different parts of the kingdom: but his stock of vaccine matter having become exhausted; and being disappointed in supplies from the dairies, he could not answer all the demands that were made to him for virus.

It was not till towards the end of November that he was enabled to procure any. On the 27th of that month he inoculated two of the children of his friend Mr. Hicks, of Eastington, with matter taken the preceding day from a farm at Stonehouse. I dwell on this incident that I may, in the first place, record Mr. Hicks's confidence in the prophylactic powers of cow-pox, who had the merit of being the

first gentleman that submitted his own children to the new practice; and, in the next place, to disprove an assertion subsequently made that the first vaccinations performed by Dr. Jenner, after the publication of his Inquiry, were with virus furnished by Dr. Pearson.*

The commencement of the intercourse between Dr. Pearson and Dr. Jenner augured a very different progress and termination from those which actually took place. The early letters of the former indicated not less ardour in behalf of vaccination than respect and admiration for its author. Dr. Jenner amply repaid the good-will of his correspondent by the most unreserved communication of all the knowledge which he possessed, concerned merely for the dissemination of truth, and regardless of all personal considerations.

Soon after the subject had attracted public attention Dr. Pearson rendered service to the cause of vaccination by establishing an extensive correspondence with medical men in different parts of the kingdom, by which he was enabled to prove that cow-pox was much more widely epizöotic than had been at first believed; and that all the local traditions fully confirmed Dr. Jenner's positions.

* The first personage of rank who broke through the chains of prejudice, and had her only child vaccinated, was the Lady Frances Morton (now Lady Ducie.) The Countess of Berkeley equally surmounted every prepossession in favour of the old practice, and at the commencement, as well as at every subsequent period, ardently recommended and adopted the new.

It is painful to be compelled to state that the feelings avowed to Dr. Jenner at this period ill accorded with the attempts which were afterwards made to overthrow his undoubted, and previously admitted, claims as a discoverer. On the 8th of November, 1798, and just on the eve of the publication of his pamphlet, Dr. Pearson wrote a letter to Dr. Jenner which, among other matter, contained the following expressions: "Your name will live in the memory of mankind as long as men possess gratitude for services, and respect for benefactors; and if I can but get *matter* I am much mistaken if I do not make you live for ever."

About the middle of November Dr. Pearson's pamphlet was published. This circumstance was thus announced to Dr. Jenner.

DR. PEARSON TO DR. JENNER.

MY DEAR SIR,

Unexpectedly my pamphlet made its public appearance a day or two ago. I am sorry to trouble you to say by what conveyance I can send you a copy, and to what place? If you have any commissions to execute in London you may as well have a parcel made up, and I will see it forwarded.

I observe several errors since printing, partly mine and partly those of the printer; but I know other authors discover similar errors, and that readers do not perceive them.

You cannot imagine how fastidious the people are with

regard to this business of the cow-pox. One says it is very filthy and nasty to derive it from the sore heel of horses! Another, O my God, we shall introduce the diseases of animals among us, and we have too many already of our own! A third sapient set say it is a strange odd kind of business, and they know not what to think of it! All this I hear very quietly, and recollect that a still more unfavourable reception was experienced by the inoculation for the small-pox.

I wish you could secure for me matter for inoculation, because, depend upon it, a thousand inaccurate but imposing cases will be published against the specific nature of the disease by persons who want to send their names abroad about any thing, and who will think yourself and me fair game. By way of *se defendendo* we must inoculate. I have thought it right to publish the evidence as sent to me, and also my own reasoning, because I know you are too good a philosopher to be offended at the investigation of truth, although the conclusions may be different from your own. I think, too, your principal facts will be the better established than if it had happened that I had uniformly acceded to all your doctrine.

I am, with Mrs. P.'s best compliments to Mrs. Jenner and yourself,

Your faithful Servant,

G. PEARSON.

Leicester Square, Nov. 13th, 1798.

"NOS POMA NATAMUS!!"

Dr. Pearson and other medical gentlemen went on speculating, and doubting, and deciding on Dr. Jenner's doctrines without ever having seen at the time

an example of cow-pox, or having given due consideration to his arguments in favour of the opinion as to the origin of the disease. Matters continued in this state till about the 20th of January 1799, when it was discovered that the cow-pox existed in a dairy in Gray's-inn-lane, London. This occurrence was made known to Dr. Jenner by Dr. Woodville.

DR. WOODVILLE TO DR. JENNER.

Ely Place, Jan. 25, 1799.

DEAR SIR,

* * * * *

On Sunday last I was informed that the cow-pox had broke out among Mr. Harrison's cows in Gray's-inn-lane. The next day I took Mr. Tanner with me to examine them; and as he declared it to be the genuine disease, I that day inoculated six persons with the matter that he procured from a cow which appeared to be the most severely affected with this pustular complaint. On Wednesday I called again at the cow-house to make farther inquiries, when I was very much pleased to find two or three of the milkers were infected with the disease; one of whom exhibited a more beautiful specimen of the disease than that which you have represented in the first plate. From this person I charged a lancet with the matter which appeared different from that taken from the cow, as that of the former was purely lymphatic, and the latter of a purulent form. With this lymphatic matter I immediately inoculated two men at the hospital.

Finding now there could be no doubt of the disease I the same day called upon Sir Joseph Banks, Dr. Pearson, Dr. Willan, &c. to inform them of the circumstance; and

these gentlemen, together with Lord Somerville, Sir William Watson, and Mr. Coleman, met me the following day at the cow-keeper's, where your book was produced; and upon comparing *your figure* with the disease it was allowed by all to be a very faithful representation, and every gentleman seemed highly gratified at seeing so good an example of the cow-pox. From this place we proceeded to the hospital where I inoculated six patients, so that the whole number inoculated by me with the cow-pox matter amounts to fourteen.

* * * * *

DR. JENNER TO DR. WOODVILLE.

MY DEAR SIR,

I am extremely obliged to you for your letter, and most sincerely wish circumstances would admit of my being at your elbow while you conduct your experiments on the interesting subject before you.

I answer your letter by return of post to suggest (what perhaps is needless) the immediate propriety of inoculating those who may resist the action of the cow-pox matter, and may have been exposed to variolous contagion at the hospital. After the description you have given there can be no doubt I think that the disease among the cows in Gray's-inn-lane is the true, and not a species of the spurious cow-pox. In the account of the appearance on the milker's hand the report of my friend Tanner merits great confidence. Whether to the cold season of the year or to what other cause it can be ascribed I know not, but out of six patients that I lately inoculated two of them only were infected. An inflammation was excited in the arms of all, and in some of those, whose constitutions would not feel it,

it did not die away for more than a week, and even went on so as to leave a little scab behind.

It has not happened so, generally. However, once in the course of the last summer I was foiled in a similar way. Three or four servants at a farm were carefully inoculated with matter fresh from a cow:—they all resisted it, but in the course of the season all of them were infected by milking the cows. As every case of cow-pox is to be considered as a case of inoculation I mention these facts to you, that it may be considered whether some mode more certain of infecting the subject than that at present in use with variolous matter may not be thought of.

It would imitate the casual mode more closely were we first by scratch or puncture to create a little scab, and then, removing it, apply the virus on the abraded part.

I am shortly going to publish an appendix to my late pamphlet (which, by the way, I hope you received, as I directed it to be sent to you before I left London) to mention the precaution of destroying the pustule and the general sources of spurious cow-pox, &c. &c.

I shall also point out the result of one of the cases where caustic was used soon after the symptoms of infection appeared (see page 41). This I shall concisely relate to you now. About six weeks ago I inoculated M. James (see page 40) with fresh small-pox matter, and at the same time exposed her to the effluvia of a patient. The appearances of the arm were just the same as if she never had had either small-pox or cow-pox: and on the eighth day I expected, from the appearances, she would be ill. She was a little hotter than usual during the night but slept well, and it was supposed that a rash appeared for the space of a few hours about the wrists. I inserted matter from her arm into two other subjects, a boy, and woman of fifty. The

boy had about half a dozen pustules, two or three of which were fairly characterized. Their appearance was preceded by a pretty general rash. The woman, though she felt an indisposition, had not a single pustule. A person near sixty years of age, who had in the early period of her life been exposed to the contagion of the small-pox and resisted it, fully exposed herself now to this infection. She sickened in consequence and had three pustules, one of which became a perfect small-pox pustule. It would be unfair to draw positive conclusions from such scanty precedents, but yet they lead one to hope that a mild variety of the small-pox might thus be actually created.

* * * * *

The result of the trials mentioned in Dr. Woodville's letter, and of others performed under like circumstances, had well nigh proved fatal to the infant cause of vaccination. They were all instituted at the Small-pox Hospital in London; and many of the patients, besides being exposed to a variolous atmosphere, actually had small-pox matter inserted into the arm on the third and fifth days after vaccination: and strange to say, this was deemed a fair trial of the virtues of cow-pox. Every one at all acquainted with the influence of small-pox contagion might have anticipated what actually occurred. Dr. Jenner had positively asserted that pustules do not belong to the cow-pox, as he had never seen them produced by genuine vaccine matter. Dr. Woodville, on the contrary, reported that three-fifths of the patients whom he had inoculated with

vaccine matter had pustules not to be distinguished from variolous ones. A statement of this kind, from such a quarter, so much at variance with what had been anticipated, excited the strongest feelings of disappointment among the principal medical men in London; and, of course, for a season threw considerable doubts on Dr. Jenner's accuracy. He from the commencement suspected the real cause of this deviation; but he was willing to give the gentlemen who began the experiments in London the benefit of every supposition that might tend to acquit them of the blunder which they had actually made. He thought it possible that there might be some peculiarity either in the constitution of the individual vaccinated, or something in the nature of the virus itself that might occasion the eruptions: but after admitting these suppositions he could not help hinting to one of the gentlemen concerned, in the earliest letter he addressed to him on the subject, that he *could not divest himself of the suspicion that the London cow-pox was somehow or other compounded with small pox.* When he became fully acquainted with the manner of conducting the practice in the Small-pox Hospital,* this suspicion amounted to

* The following anecdote, illustrative of the manner of conducting vaccination at the Small-pox Hospital, has been communicated to me by a gentleman on whose authority I can rely. A medical gentleman who was particularly forward on the occasion, but who was not very well acquainted with the characters either of small-pox or of cow-pox, applied to Mr. Wachsel,

certainty; and at a later period he had the hardihood to declare to Dr. Woodville that the matter had absolutely been contaminated in the Hospital. The word *contaminated* was very distasteful to the Doctor, although it was the only one that was really expressive of the fact and was certainly not used in an offensive sense by Dr. Jenner. The disasters which arose from this contamination might well have justified a stronger expression on his part. It is impossible now to deny the fact that this *impure* matter was really disseminated over many parts of England, and also on the Continent, in place of that of the true Variolæ Vaccinæ. It was the practice of Drs. Pearson and Woodville to take matter from the patients who had eruptions, and with it to inoculate others. This curious fact was communicated to Dr. Jenner by Dr. Pearson.

the apothecary, for leave to charge some threads with vaccine virus, professedly to distribute them to his medical correspondents throughout the island. Mr. Wachsel chanced to be called out of the apartment; during his absence the doctor selected a patient, and was busily engaged in charging his threads. Mr. Wachsel observed on his return that he had fixed on a patient who had a general sprinkling of small-pox pustules, and inquired whether he intended to furnish his friends with the virus of small-pox as well as of cow-pox? He replied "with the virus of cow-pox only." "Then, Sir," said Mr. Wachsel, "you know not what you are doing, you are taking the virus of small pox." The threads thus charged, but for Mr. Wachsel's vigilance, would have been distributed as vaccine virus!!!

DR. PEARSON TO DR. JENNER.

Leicester Square, February 15th, 1799.

MY DEAR SIR,

* * * * *

Our apprehensions are now almost entirely dissipated of danger from inflammation around the inoculated parts. In my patients it has been inconsiderable indeed, not amounting to inflammation, being merely what I would call erythematous, or the same kind of affection as in scarlatina. I have inoculated two infants of fourteen days old: one of them did not take the disease the first time but did the second time, but the constitution was not apparently disordered, and there was less redness around the pustules, which were large and conical, than even in the small-pox. I therefore inoculated it yesterday in the presence of Dr. Woodville a third time, from a patient in the same room ill of the cow-pox with eruptions on the body to the amount of two or three hundred. You will be astonished at our talking of eruptions, but it now appears in Dr. Woodville's cases that as many have eruptions on the body as have them only in the parts inoculated.

I inoculated a child about fourteen months of age with matter from one of Dr. Woodville's patients in one arm, and in the other with matter from the cow. To my astonishment the disorder proceeded exactly as the inoculated small-pox. On the ninth day convulsive fits came on, and vomiting occurred with other pretty violent symptoms, which alarmed me and made me very uneasy. The eruptions appearing on the body in great number, all became tranquil. A few only suppurated; the rest died away

sooner than the suppurated. I could not persuade myself but that there was some mistake, and that Dr. Woodville's lancet, which I used, had variolous matter upon it. I called him to see the patient. He assured me the lancet having been lately ground had not been used, and that the patient from whom he took the matter had but two or three, and those not like the small-pox. He had no doubt that my patient, notwithstanding the numerous eruptions, had nothing but the cow-pox. And to-day, at the hospital, a patient appears to be likely to have as many eruptions as my patient. I shall ascertain this fact by inoculating patients with the matter of the eruptions. As I am to write to-day Dr. Woodville will not send his letter for some days, in order to report the further progress. I have sent you a bit of thread with matter upon it in this letter. The stiff part will denote the part imbued with the infectious fluid. It is from Dr. Woodville.

It appears that the more severe the previous symptoms the greater the crop of eruptions: and I think the sooner the disease takes place the more eruptions appear.

In some cases the patients have been ill only *two* days, but in one case *six* days:—I mean ill with the constitutional affection. For the most part there are very few suppurated pustules. All the symptoms are relieved on the eruptions taking place.

Some of my patients made no complaint at all, nor till asked did I hear of even pain of the *armpits* or rather of the *shoulder*.

On the whole, Dr. Woodville and myself conclude that the inoculated cow-pox, as far as we have seen in at least fifty cases, is a slighter disease than the inoculated variola, and that it is not probable there is any danger to life from it.

On telling Dr. Woodville that I had been anxious about your publishing the use of the caustic, he replied " that would have damned the whole business."

Be assured that if the practice cannot be introduced without the caustic, or call it by any other name, it will never succeed with the public. I cannot yet tell whether all my patients have had sufficient affection of the constitution. There has not been time for a second inoculation and with variolous matter. Some of the patients had undergone the small-pox.

Dr. Parr's letter you shall see in town merely to satisfy you, but it contains nothing that is relative beside what I extracted from it. I must tell you that Dr. Parr has written to me to say that although he " is not yet convinced he is staggered, and begins to doubt." We shall have to experience soon a number of *gnat bites.* If the practice is likely to go forward it will excite opposition. What obligation society owes to those worthy and liberal men who favour the public with their *a priori* opinions, having never seen the disease, and not even understanding the arguments!! Tantæne animis cœlestibus iræ!

I trust we shall establish facts enough to prove whether cow-pox inoculation extinguishes that of the *variola* or not. We have got able, candid, and worthy men on our side, and proceeding as we have all done, circumspectly, I do not feel any dread from the opponents who have yet taken the field.

Mrs. P.'s best compliments to Mrs. Jenner.

Dear sir, yours,

G. Pearson.

It is somewhat inconsistent with the habits of wise men to apply such expressions as are last quoted to a series of experiments unexampled for the absence of all the precautions necessary to give them effect: and now that the danger which was threatened has been obviated we may be permitted to smile at the ability, candour, and circumspection evinced in the management of this new and delicate process. It will hereafter appear, when we come to consider the cases at Petworth, that the matter which was issued by Dr. Pearson produced pustules similar to those that were seen at the Small-pox Hospital. This, however, did not happen with all the virus so sent out. Dr. Jenner received some of it in the early part of March 1799, and used it successfully.

DR. JENNER TO DR. PEARSON.

Berkeley, March 13th, 1799

MY DEAR SIR,

I received your letter while I was writing to Dr. Woodville, and requested him to transmit to you the result of the inoculation with the London virus. I hope he did not fail to execute my wishes. Twelve patients have since been inoculated with matter produced by this virus. They all took the infection. This is the ninth day, and they appear a little ill—no eruptions yet. The character of the arm is just that of cow-pox, except that I do not see the disposition in the pustule to ulcerate as in some of the former cases. I am the more induced to believe this to be the *genuine* cow-pox from the following circumstance.

One of the boys inoculated, sickened the preceding day with the measles, which went through its course. Yet the pustule advanced with the same regularity as if the measles had not been present. Now this would not have been the case, I presume, had variolous matter been inserted into the skin under similar circumstances. No cow-pox yet in the country! Should it appear within a particular district I shall undoubtedly know it. It cannot now be long before I shall see you in town; at least I can speak with as great a certainty of being soon there as a medical man can.

I hear of a child covered over with pustules at the Small-pox Hospital. What are they?

I am glad to find that the disposition for forming eruptions among your patients does not increase, as you tell me that none of your last inoculated patients had any, and that Mr. Rolph's children went through the disease without them. Tanner I find could not succeed in giving the cow-pox to the veterinary cow in a direct way, that is, by inserting the virus into a sound part of the nipple, in the same way as all the experiments have hitherto been conducted to confute my notions with the matter of grease; but when he found a part of the nipple that was previously affected with a sore, and applied the matter there, it took effect immediately. With best respects to Mrs. Pearson,

I remain, dear sir,

Yours very truly,

E. JENNER.

Drs. Pearson and Woodville continued to exert themselves with great assiduity to diffuse the practice of vaccination. They issued a printed circular

letter containing an account of their practice at the Small-pox Hospital, and inclosing a bit of thread imbued with the cow-pox virus. Sixty persons had at that time been put to the variolous test without receiving the infection. At this period, one of these gentlemen gave himself a great degree of prominence in the important question which now agitated the medical world, by placing himself in a situation that he was not entitled to fill; and which, of right, belonged to another. The developement of this design was cautiously unfolded; and had not Dr. Jenner's friends been more vigilant than himself it certainly would have succeeded to a greater extent than it did. His nephew Mr. George Jenner who was then in London, wrote an account of what was going on, and very properly warned his uncle of the injury that might be done to his fame if he did not appear there in person to vindicate his claims. Mr. Jenner's letter is so descriptive of the state of matters at this time that I deem it right to subjoin it.

G. C. JENNER TO DR. JENNER.

Norfolk Street, March 11th, 1799.

MY DEAR SIR,

After what Mr. Paytherus has written to you it will be needless for me to say any thing to urge the necessity of your coming to town to wear the laurels you have gained, or to prevent their being placed on the brows of another.

I shall only state a few facts I have got possession of since I wrote to you last. Dr. Pearson is going to send circular letters to the medical gentlemen to let them know that he will supply them with cow-pox matter upon their application to him, by which means *he* will be the chief person known in the business, and consequently deprive you of that merit, or at least a great share of it, which is so justly your due. Doctor P. gave a public lecture on the cow-pox on Saturday last. Farmer Tanner was there. Doctor Pearson adopted your opinions, except with regard to the probability of the diseases originating in horses' heels. He spoke of some unsatisfactory experiments having been made by inoculating from the greasy heels; but when we consider how difficult it was to communicate the disease from one cow to another by inoculation we are not to wonder at the still greater difficulty in communicating it from the horse to the cow. The farmer says Dr. Pearson was wrong in some part of his lecture, which he *took the liberty to tell him.*

Mr. Paytherus is much disappointed not to receive any letter from you by this day's post, but hopes you may be coming up to-day and therefore did not write. All your friends agree that *now* is your time to establish your fame and fortune; but if you delay taking a personal active part any longer the opportunity will be lost for ever. If Dr. Pearson does not intend to endeavour to give the merit to himself why should he quibble about the name you gave the disease? The eruption he calls the *vaccinous* eruption.

Your affectionate nephew,

G. C. Jenner.

Mr. Paytherus has just told me that a copy of Doctor Pearson's letter was exhibited yesterday at Sir Joseph

Banks's. When I get a sight of it I will send you an account of it.

Dr. Jenner in allusion to this letter writes thus to his friend Gardner.

DR. JENNER TO MR. EDW. GARDNER.

Berkeley, Wednesday, 1799.

DEAR GARDNER,

A letter I have just received from G. Jenner informs me that Dr. Pearson on Saturday last gave a public lecture on the cow-pox, and that it was publicly exhibited at Sir J. Banks's on Sunday evening. He has also given out that he will furnish any gentlemen at a distance with the virus.

As this is probably done with the view of showing himself as the first man in the concern, should not some neatly-drawn paragraphs appear from time to time in the public prints, by no means reflecting on the conduct of P. but just to keep the idea publicly alive that P. was not the author of the discovery—I mean cow-pox inoculation.

Yours truly,

E. J.

Dr. Jenner now began seriously to feel the weight of that responsibility which rested on him from the publication of his "*Inquiry*." He had the deepest cause to lament the precipitancy of some of his professional brethren. They rejected his statements without even attempting to understand him, and permitted prejudices to stand in the way of evidence the most conclusive. He had especial reason to feel much dissatisfaction in the result of some of the

trials which were made in London, and consequently could not be assured that his own character and what he certainly valued much more (the success of vaccination) might not have sustained a serious shock. He was, moreover, assailed by many adversaries in his own district, some of whom, it is to be feared, were moved by considerations not of the purest nature. The following letter, whilst it affords a pleasing illustration of his well-founded confidence in the accuracy and power of his own knowledge, nevertheless shows his lively sensibility to every attack that threatened to obstruct his favourite cause, the cause of humanity and truth.

DR. JENNER TO MR. EDWARD GARDNER.

DEAR GARDNER,

There never was a period in my existence when my situation called so loudly for the assistance of my literary friends as the present. Though my bark will, with flying colours, reach the shore at last, yet it is now in a storm.

I am beset on all sides with snarling fellows, and so ignorant withal that they know no more of the disease they write about than the animals which generate it. The last philippic that has appeared comes from Bristol, and is communicated by Dr. Sims of London. Sims gives comments on it in harsh and unjustifiable language. It is impossible for me, single-handed, to combat all my adversaries.

Standing, as I do, before so awful a tribunal, my friends will volunteer their counsel and IMMEDIATELY appear in court.

My intended pamphlet has only been looked over in a cursory way. Every sentence must be again revised and weighed in the nicest balance that human intellect can invent. The eyes of the philosophic and medical critic, prejudiced most bitterly against the hypothesis, will penetrate its inmost recesses, and discover the minutest flaw were it suffered to be present. Language I put out of the question: the matter is what I allude to.

Give me as much of your company as you can, and as speedily.

Yours, very faithfully,

E. JENNER.

Thursday, March 7th, 1799.

On the 21st of this month Dr. Jenner availed himself of the advice of his friends and left Berkeley for London, where he took up his residence in Norfolk-street. On the 23d he had an interview with Dr. Woodville who informed him that he had vaccinated upwards of 200 patients. To show how little the real character of cow-pox, as described by Dr. Jenner, accorded with what was said to have occurred in London, this physician, at the interview in question, actually mentioned that the cow-pox had been communicated by effluvia; and that the patient had it in *the confluent way*. Dr. Jenner's remark on this marvellous occurrence was simply, "Might not the disease have been the confluent small-pox communicated by Dr. Woodville, as *he* is always full of the infection?"

Dr. Jenner remained in London till the 14th of

June: during his stay he had frequent intercourse with most of the other medical men of eminence resident in the metropolis. As the events which occurred at the Small-pox Hospital were so different from what *he* had experienced, he was very desirous of procuring fresh cow-pox virus from the country. For this purpose he sent to Gloucestershire; and, by great exertions on the part of Mr. Robert Tanner, he procured some from North Nibley. A portion of this he gave to Mr. Knight on the 12th of April.

The "Reports" of Dr. Woodville were at this time in the press. This work was published in June, and seemed to carry with it most formidable objections to some of Dr. Jenner's main positions. It was *concluded* that the vaccine disease was not derived from the horse. It was also contended that the cow-pox was occasionally an eruptive disease of great severity; that "three or four cases out of 500 had been in considerable danger; and that one child had actually died under the effects of the disease." The other conclusions which he drew were that the matter of the vaccine disease has generally produced fewer pustules than that of small-pox, and less indisposition. Notwithstanding this admission, his "*Reports*" were eminently calculated to repress the ardent expectations that had been excited in favour of vaccination; for he thus proceeds, after mentioning the supposed fatal case of cow-pox: "Now if it be admitted that one of five hundred will die of the noculated cow-pox I confess I should not be dis-

posed to introduce this disease into the Inoculation Hospital, because out of the last 5000 cases of variolous inoculation the number of deaths has not exceeded 1 in 600. *

Dr. Jenner had the consolation of knowing that this alarming statement, published by the authority of the physician to the Small-pox Hospital, was not confirmed by the experience of other very competent judges. With the matter which had been sent from London on the 15th of February from Dr. Woodville he inoculated his grand-nephew Stephen Jenner, and a boy of the name of Hill about four years of age. The progress of the disorder in both is described in his second pamphlet, published a few weeks before that of Dr. Woodville.

There were in each a few small spots on the arm; and, in the first, on the face; but they disappeared in a day or two, and caused no inconvenience to the patient. These children were afterwards fully exposed to small-pox contagion without effect.—With matter taken from the arm of the boy Hill Dr. Jenner next inoculated two of the children of his friend Mr. Hicks, of Eastington, and at the same time sixteen others. They all took the infection, but no pustules appeared. With matter taken from this source his nephew Henry Jenner vaccinated successfully a child of twenty hours old. The same stock supplied Dr. Marshall with virus for his inocu-

* See "Reports," p. 151.

lations, which commenced with two of his own children, on the 22d of March. Between that day and the 26th of April he employed it on 107 persons. "In only one or two of the cases," he observes, "have any other eruptions appeared than those around the spot where the matter was inserted."*

Still farther to investigate the subject, and to determine whether there was any peculiarity in the matter found in the London dairies which tended to produce eruptions, Dr. Jenner, whilst he was in town, procured some genuine cow-pox virus at Mr. Clark's farm at Kentish-town. This he immediately dispatched into Gloucestershire by his friend Mr. Tanner. With this virus Dr. Marshall resumed his inoculations. In his second letter † to Dr. Jenner

* See the letter in Dr. Jenner's "Continuation of Facts and Observations," p. 14.

† This second letter which is printed at p. 16, unfortunately had not the date attached to it: but the original, which is at this instant in my possession, bears date "Eastington, September the 8th, 1799." I am happy in being able to supply this omission, because it affords me an opportunity of vindicating Dr. Jenner from a very harsh criticism published in Dr. Woodville's observations on the cow-pox, in July 1800. By confounding the time at which the last letter was written, with the date of the first, Dr. Woodville makes it seem that Dr. Marshall could not have performed any of the vaccinations which he recorded with the matter sent by Dr. Jenner from the cow at Kentish-town; inasmuch as he did not even obtain that matter till after the date of that letter, "which is said to contain an account of its effects by inoculation."—See Woodville's "Observations on the Cow-pox," p. 10.—Now it happens, unfor-

he mentions that he had employed it in 127 cases. The following sentences, in reference to Dr. Woodville's assertions, deserve notice. "In Dr. Woodville's publication on the cow-pox I notice an extraordinary fact. He says that the generality of his patients had pustules. It certainly appears extremely extraordinary that in all my cases there never was but one pustule which appeared on a patient's elbow on the inoculated arm, and maturated. It appeared exactly like that on the incised part."

The result of Dr. Marshall's first series of inoculations was communicated by Dr. Jenner to Dr. Woodville. But this gentleman was not disposed to admit that any error had taken place in his own practice. His statements, however, of the eruptive nature of cow-pox began to be less peremptory, as will be seen from the following extract of a letter dated on the 22d August, 1799.

tunately for Dr. Woodville's position, that the second letter has no date at all; and it is as much distinguished from the first as *capital letters, inverted commas,* and *subject matter* can make it. At the time the first letter was written (namely, April 25th, 1799) Dr. M. had vaccinated 107 persons: when the second was written the number amounted to 423: of whom it is mentioned in the postscript that 127 were infected with the matter from the Kentish-town cow. With all these most palpable distinctions it is not a little remarkable that Dr. Woodville should have written as if there had been but *one* letter of Dr. Marshall's, and *that* the *first;* forgetting entirely that the *second* bore internal evidence of having been written many months after the former.

"The cow-pox inoculations certainly go on very successfully here, but we cannot, like Dr. Marshall, boast that our cases have never been attended with eruptions. Since Mr. Knight inoculated the Duke of Clarence's children he has had a case in which the pustules were sufficiently numerous to excite no small alarm for the safety of the patient, and though the disease at the hospital has not lately put on a formidable aspect it still continues *occasionally* to produce pustules."

I am sorry to be obliged to observe that Dr. Woodville, in mentioning this severe eruptive case in the practice of Mr. Knight, showed less regard to accuracy than the occasion required. Mr. Knight, who was at that time inspector general of military hospitals, was more instrumental than any other professional gentleman in diffusing the benefits of the new practice among the higher orders in London. In addition to the children of many of the nobility he was called on to vaccinate two of the children of the Duke of Clarence, at Bushy. Dr. Jenner wrote to Mr. Knight on receiving Dr. Woodville's letter. Mr. Knight's reply was quite satisfactory.

F. KNIGHT, ESQ. TO DR. JENNER.

Aug. 28th, 1799.

MY DEAR SIR,

The cow-pox must have its prejudices and misrepresentations. Dr. Woodville's report does not apply to the

recruit, but to a case that I had at Mortlake, where I had a country-house. You shall have the detail of it, and will then judge how much it attaches to the cow-pox. It was the small-pox, but never occasioned a momentary alarm for the safety of the patient. You shall have the detail of it, for it is not a little interesting.

With a lancet armed from one of the Duke of Clarence's family I inoculated a young girl about ten years of age. It showed no signs of early infection and on the fifth day I was going to insert fresh matter, when I felt a little elevated pimple in the part, but without the least inflammation. It continued uncommonly sluggish, and after fourteen days scarcely formed a vesication as big as a small pea, which had no indented mark in the centre, nor any surrounding inflammation.

About this period she became feverish, and had the usual symptoms of approaching small-pox, which broke out two or three days afterwards. I was at this time obliged to quit Mortlake on account of my preparations for the Continent, and taking Mrs. Knight into Gloucestershire; but anxious to know the event of this case, and how far the appearance of the arm agreed with the progress of eruption, I employed a very clever regimental assistant to go down in my absence, and report the particulars to me.

It was on the eighth day of the eruption that he saw her. The pustules were numerous, distinct, and maturated into surrounding inflammation. Those on the face were on the turn. Where the vaccine matter was inserted, near three weeks before, there was a large circular pustule *containing lymph*, with a crust of a dark blue cast inclining to black, indented in the middle, and the edges elevated above the skin. He says it had the exact appearance of the inoculated cow-pox on the *ninth day*, (but he certainly must

mistake,) except the surrounding erysipelatous inflammation; as in this case there was only an inflamed line round the bottom of the pustule, in which there was one small pock elevated and maturated.

The appearance of this girl's arm was so singular from the beginning, and betrayed such marks of suspended action, that I noticed it to those about her; and, conceiving that it was mere sluggishness of habit, I ordered her to have some wine and to live better. The small-pox had prevailed greatly in the village, but she was not known to have been in the way of it. Her disease was certainly the small-pox, and as certain is it that I inoculated her with a lancet armed from one of the children at Bushy; but from whatever source the small-pox sprang, it kept no pace with the pustule on the arm; which lingering as it was in its local action, never betrayed the least similitude to the small-pox pustule. Pray let me have your sentiments on the case.

* * * * *

Notwithstanding the prejudices which were excited against cow-pox by the report of its being an eruptive disease, it continued to gain ground. Many distinguished individuals, in different parts of the kingdom, eagerly availed themselves of the promised benefit of the practice, and exerted themselves to diffuse it as widely as possible. It is a gratifying thing to be able to remark that the ladies of England were conspicuous in this work. Lady Peyton, sister of Lord Rous, must be ranked among the first who, by personal efforts, stimulated the professional gentlemen in her neighbourhood to adopt vaccination; and she herself subsequently

became one of the most energetic and successful of vaccinators.

This is not the only instance in which Dr. Jenner received most efficient and valuable assistance from individuals who did not belong to the profession. Indeed it will presently appear that the cause of vaccination would have been most materially injured if the good sense, and fair-dealing, and resolution of those to whom I refer, had not enabled him to withstand, and finally to overthrow the opposition which he encountered in other quarters. I have already mentioned Henry Hicks as his friend and counsellor: I have also mentioned how sedulously he promoted vaccination by first submitting his own children to it, and then diffusing it in his neighbourhood: I have now to attempt to commemorate his services in another line. He made himself perfectly acquainted with all the details of cow-pox inoculation; and about this time he brought this knowledge into practice. He commenced a series of inoculations; and evinced an accuracy and fidelity which would have done honour to the most enlightened physician. To show that this is no exaggerated praise I will mention that in a letter to Dr. Jenner, dated the second of August, he communicated an observation which at a subsequent period was also noticed by Mr. Bryce, of Edinburgh, and which led that gentleman to propose the only thing like an improvement in the practice of vaccination that was not suggested by Dr. Jenner him-

self. In two of the persons whom Mr. Hicks had vaccinated he found that "the arms came on so slowly that on the sixth day the pustules were not more forward than they generally are on the third or fourth: added to which, there appeared so much irregularity in them that I thought it better to show their arms to Mr. Darke." Two days afterwards Mr. Hicks determined to re-vaccinate them. The result he communicated in the following words: "The second inoculation seemed to make immense strides to overtake the first; and, what is wonderful, the first pustules began to change their character and put on the true vaccine appearance." He also made another remark which proves how quickly he detected every peculiarity in the progress of the affection. He adds, "I must not forget to tell you that Chamberlain's child, before the inoculation, had some eruptions on its arm and back, and as the vaccine pustule came on, these pustules assumed the exact vaccine character, and became perfect cow-pox pustules." It is due to Mr. Hicks to declare that there is more original and satisfactory information to be derived from his remarks than from those of all the individuals who had written on the subject, from the time of the publication of Dr. Jenner's Inquiry.

Another gentleman, who had become acquainted with Dr. Jenner at Cheltenham and had obtained in conversation with him a knowledge of the subject of cow-pox, felt so deep an interest in its success

that he not only occupied himself in investigating the history of the casual disease, but likewise in propagating it by inoculation. The gentleman to whom I allude is William Fermor, Esq. of Tusmore, in Oxfordshire. By diligent inquiry he discovered that the cow-pox was occasionally epizöotic in his own neighbourhood; and in a little work which he published in May 1800, he detailed several cases of individuals who had caught the infection from the cow; and who had subsequently resisted small-pox by inoculation and exposure in every way. Not satisfied with this very valuable information he resolved to have a series of cow-pox inoculations instituted under his own eye. As he was not himself a medical man he was assisted on this occasion by the Rev. George Jenner, the nephew of the Doctor. He carried the matter with him from Berkeley, and the experiments were conducted with the concurrence and under the inspection of many of the most learned professors of Oxford, and the most distinguished medical men in the neighbourhood. Among these may be particularly mentioned Sir Christopher Pegge, Drs. Wall, and Williams, and Mr. Grosvenor. In a short time 326 persons were vaccinated, of all ages from two months to sixty-nine years. Of these 173 were subsequently inoculated with small-pox, but never felt its influence.*

* A very interesting correspondence was carried on, for some time, between Mr. Fermor and Dr. Jenner on the subject of

Whilst things were thus proceeding in England the knowledge of Dr. Jenner's surprising discovery was exciting the deepest interest wherever it was heard of on the Continent. The unhappy war which then raged prevented direct intercourse with France and many other parts. The "*Inquiry*" nevertheless found its way, in the course of this year, (1799) to Geneva, Hanover, and Vienna. In the first-mentioned place Drs. Odier and Peschier collected all the information that could be obtained on the subject, and communicated it to the scientific world through the medium of the Bibliothèque Britannique. In Vienna, the cause of vaccination was taken up by Dr. De Carro with a zeal commensurate to its importance, and fostered and disseminated with a degree of wisdom and energy which has not been exceeded on the part of any of the eminent individuals who have advocated or advanced it. Another opportunity will soon occur for recording his great and most beneficial efforts in diffusing vaccination over a great part of Europe, and finally, through Turkey into our possessions in Asia.

vaccination, a subject to which (as has been said) Mr. F. paid close and judicious attention. In one of his early letters inviting Dr. Jenner to his seat in Oxfordshire he playfully says of one of the chief antivaccinists, first premising that he had had, during a late tour, "various conversations with medical men on the subject of the cow-pox," "I told Dr. Moseley that in his assertion against it he had acted the part of the devil's advocate at a canonization, who was to say all the harm he could against the saint in order that his life might be thoroughly scrutinized, and his merits appear the more conspicuous."

At this time it is more proper to dwell for a season on his own personal relations to Dr. Jenner. They never had the happiness of meeting, but I believe that I do not hazard an unfounded statement when I express my conviction that few or none of Dr. Jenner's friends had formed a more correct estimate of his character, more truly loved the purity and benevolence of his moral feeling, or more deeply venerated his surpassing genius, than he of whom I now speak. His first letter to Dr. Jenner is dated at Vienna, on the 14th of September, 1799. It is altogether so interesting, and describes in so satisfactory a manner the very first inoculations for cow-pox on the Continent, that I think it proper to subjoin it here.

DR. DE CARRO TO DR. JENNER.

SIR, *Vienna, 14th Sept.* 1799.

Although I have not the honour to be known to you I hope that you will excuse the liberty I take of addressing myself to you, convinced that you are sensible of the utility that men, pursuing the same inquiries, should as much as possible communicate together.

Before I proceed I must assure you that among the innumerable admirers of your discovery, none feels more the importance of it, and is ready to do more to propagate its benefits, than I am. As soon as I heard of it I wrote to London to have your work, and desired a medical friend of mine to procure me some vaccine matter from a good source. He sent me two threads that came from Dr. Pearson, with some accounts of that gentleman's successes in the brilliant road which you have opened. The first

subject I found for inoculation was the son of a physician of this town, in whom it produced two pustules, of which I need give you no other description than to tell you that they were so perfectly similar to the second and third plate of your work that one might have thought that that child's arms had been the model from which your engraver had drawn them. Encouraged by the mildness of the disease I did not hesitate to inoculate from the fresh matter of that child my eldest boy, and ten days afterwards my second boy from the arm of his brother. In my two children the disease and the appearance of the pustules were precisely similar to your description and engravings.

Three months afterwards these three children have been inoculated with variolous matter, without any effect whatever, except, in one of them, a pustule on the inoculated part, but without further effect on the system.

I have kept a quantity of matter with which the sleeves of their shirts were impregnated, sufficient for any number of other inoculations, paying the greatest attention not to collect the matter but when the pustules were in their state of greatest activity, viz. before they became ulcerated. as it happened by the scratching of my children, which I never could prevent. Though your discovery had produced a great sensation among our medical people your work was not known at Vienna before I took the pleasure of spreading it; therefore I did not find any subject for inoculation till I had inoculated my children again with variolic matter. In the month of July I inoculated two children with threads taken from these shirts, and in one of them alone the virus took effect; but the distance at which that child lived from town, and some neglect on the part of his parents, prevented me from gathering fresh matter from his inoculation. In the month of September I diluted with some warm water some vaccine matter which was in great plenty upon the shirts; and inoculated, in the

usual way, the daughter of a man whose example might have been followed by many, and it produced no effect whatever. On the 9th instant I have inoculated two twins of three years old, and yesterday, according to appearances, four punctures were so dry as to make me hope for success. However, as I had not contented myself with punctures on each child I have likewise inserted threads in the epidermis, and they looked yesterday still inflamed and red; at least the lips of the wound were not closed nor crusty; therefore I do not give up all hope of success. If these two children fail I am determined not to inoculate any more till I get fresh matter from England, for fear of discouraging such parents who are inclined to lay themselves under obligations to you. I am in daily expectation of that matter which comes from Dr. Pearson and Mr. Coleman of the veterinary school in London. However, as I wish to proceed with all the precaution which the introduction of a new method requires, I should take it as an infinite favour if you would be so good as to send me some of your genuine vaccine matter (from cows, if possible) which would give a great deal of confidence to the public of Vienna, as coming from the father of the discovery. If my request does not appear indiscreet to you you have nothing else to do than to send it to London to any person who would take the trouble of remitting it to Lord Grenville's office, at the direction of *Mr. Stratton, Secretary of Legation, at the Right Hon. Lord Minto's, Vienna;* to be sent by the first messenger with a note for me. It is perhaps necessary that I should tell you who is the person who takes this liberty with you. I am from Geneva; I have studied and taken my degrees at Edinburgh, and practise medicine at Vienna, since six years.

Though you have given some directions about the manner of preserving vaccine matter be so good as to

write me a few words upon the method which your experience has taught you to be the best. This is so much more necessary as it does not appear that cows in any part of the great Austrian Monarchy are subject to that disease; and even if they were I should not be bold enough to inoculate with their matter, as it appears that more veterinary knowledge than I have is necessary to distinguish the various diseases of cows. I have sent threads to Geneva, where inoculations have been immediately tried, but I do not know yet their result.

I have the honour to be with the highest respect,

Sir,

Your most obedient

and much obliged humble Servant,

J. De Carro, M. D.

Rauherstein, No. 983.

À Vienne, en Autriche.

P. S.—This morning the two pustules of the twins above mentioned were so much elevated that no doubt could be entertained of the success. I continue, however, in my request.*

After the inoculation of his own children, and other individuals, Dr. De Carro transmitted threads embued with the vaccine matter to Geneva, but they did not succeed. He then sent others, which were impregnated from the arm of Count Mottet. This gentle-

* In perusing this, and other letters of Dr. De Carro, it will be remembered that though he writes English, in general, accurately, yet it is not to be expected that his style shall be, at all times, free from foreign idiom.

man had previously had small pox, and he submitted to vaccination merely as an experiment, in order to settle the question whether it was possible to have cow-pox after small-pox. The matter from this source was conveyed from Vienna to Geneva by Dr. Peschier, who had been a witness of Dr. De Carro's previous vaccinations. This matter was immediately employed both at Geneva and at Colombier. Unfortunately all the persons subsequently had small-pox either in the natural way, or by inoculation. Of the former several died. This calamity, so inauspicious to the progress of vaccination, could only have occurred in the commencement of the practice when the true character of the vaccine pustule was imperfectly understood, and the knowledge necessary to conduct so delicate a process had not been acquired. The matter, in fact, taken from Count Mottet was not the vaccine, and the disease which it excited in the arms of the children at Geneva had certainly none of the properties of the genuine disease. Had the gentlemen who conducted these inoculations been fully aware of Dr. Jenner's instructions they would not have exposed those children to variolous infection, after having observed the irregularity of the progress and character of the pustules on their arms, which, from first to last, were spurious in their nature.

These untoward events did not materially obstruct the progress of vaccination in Geneva. Before the end of January 1801, fifteen hundred

persons were successfully vaccinated. Dr. Odier much distinguished himself by his exertions on this occasion. He drew up a memoir on the inoculation of the Variolæ Vaccinæ, by order of the Minister of the Interior in France, which was sent to all the officers of health in the department.

With this memoir was also distributed a paper of " advice to fathers and mothers," eloquently and affectionately recommending vaccination, and offering it gratuitously to all who were not in a condition to pay. This paper was delivered to the parents, by the clergymen, when they brought their children to receive the rite of baptism. It was signed by the physicians Vieusseux, Odier, Vignier, Manget, Veillard, Coindet, De La Rive, Peschier, and the surgeons Jurine, Fine, Maunoir.

Dr. De Carro's vaccinations commenced in the month of May 1799. A short time afterwards, the practice was introduced at Hanover by Dr. Ballhorn and M. Stromeyer. The former gentleman translated Dr. Jenner's first work into German. This was communicated to Dr. Jenner in the Latin language by the learned Hanoverian physician in a letter dated on the 5th of November, 1799.

The eruptions, which attended many of the early cases of vaccination in London, were unfortunately also propagated in different parts of the country, where the *contaminated* matter had been distributed by Dr. Pearson.

It will now be necessary to return to the pro-

ceedings of this gentleman, both as they regarded the nature of the vaccine disease itself and the measures which he contrived for its dissemination. Among other professional gentlemen who used this contaminated matter was Mr. Andrè, surgeon at Petworth. Fourteen persons were inoculated with it; and all had variolous-like eruptions, some being loaded with heavy burdens.

Lord Egremont, who had always felt a peculiar zeal for the success of vaccination, was surprised and dismayed by such untoward circumstances occurring in his neighbourhood. Had his lordship acted as some professional men did the prejudices which had already been awakened both against Dr. Jenner and cow-pox would have been much strengthened. With the dignity and prudence becoming a nobleman of such exalted rank he did not permit his mind to be swayed till he had taken proper measures to obtain information respecting these anomalies, from Dr. Jenner himself. His Lordship wrote him a long letter on this occasion, giving an ample detail of the occurrences at Petworth. Dr. Jenner* replied in this very interesting manner.

* He also received an account from his friend the Reverend Mr. Ferryman, who was then at Petworth. This gentleman on seeing the eruptions did not hesitate to say that the disease was not the cow-pox, but the small-pox. In consequence of this Lord Egremont most humanely had *all* the patients conveyed to his own house to prevent the disorder from spreading. Notwithstanding this precaution, two persons caught the disease; of whom one died. See Mr. Ferryman's letter in Ring's Treatise on Cow-pox, page 90.

DR. JENNER TO LORD EGREMONT.

MY LORD,

I am extremely obliged to your Lordship for your kindness in giving me so fully the account of the late inoculation at Petworth; a subject which, before, I did not clearly understand; and which, of course, had given me much vexation. I will just briefly lay before you part of the history of the cow-pox inoculation since my experiments were first publicly made known; which may tend in some measure to explain in what manner pustules may be produced.

About a twelvemonth ago Dr. Woodville, physician to the Small-pox Hospital, procured some virus from a cow at one of the London milk farms, and inoculated with it several patients at the Small-pox Hospital. Fearful that the infection was not advancing properly in some of their arms he inoculated them (some on the 3d, others on the 5th day afterwards) with small-pox matter. Both inoculations took effect; and thus, *in my opinion*, a foundation was laid for much subsequent error and confusion; for the virus thus generated became the source of future inoculations, not only in the hospital but in London, and many parts of the country.

Hearing a murmur among medical people that the cow-pox was not the simple disease I had described, but that in many instances it produced as many eruptions and was attended with as much severity as the small-pox, I went to town with the view of inquiring into the cause of this deviation. Dr. Woodville at once invited me to the Small-pox Hospital, and very ingenuously told me the whole of his proceedings. The inoculated patients were shown to me, and though some were without eruptions and exhibited the appearance of the true cow-pox, others were very full of them, and I could not discern any difference between them and the perfect small-pox. I therefore did not he-

sitate to tell the Doctor that it clearly appeared to me that the small-pox had crept into the constitution with the cow-pox; that I did not consider them as two distinct diseases, but as *varieties* only of the same disease; and therefore they might co-exist in the same constitution, and that thus a mixed disease had been produced. I communicated also the same sentiment to Dr. Pearson who was then, and had been, busily employed not only in inoculating from this source, but in dispersing threads embued in the virus to various places in our own country, and to many parts of the Continent. Foreseeing what was likely to ensue from these hasty measures I remonstrated against them, but was not listened to. In many places where the threads were sent a disease like a mild small-pox frequently appeared; yet, curious to relate, the matter, after it had been used six or seven months, gave up the variolous character entirely, and assumed the vaccine; the pustules declined more and more, and at length became extinct. I made some experiments myself with this matter, and saw a few pustules on my first patients; but in my subsequent inoculations there were none. From what I once saw at the hospital I had reason to think that some of these threads sent out were not only stained with small-pox matter from the contamination spoken of, but that they had sometimes a dip in a real small-pox arm; as the patients were all mingled together at the hospital, and stood with their arms bare, ready to afford matter one among another. Without making any further trials with matter from the cow managed in another way Dr. W. published a volume containing the result of his practice, which certainly damped the spirits of many who had from my representation taken up a high opinion of the cow-pock inoculation. A thought now struck me that, if possible, it would be proper to procure

matter from a London cow, and compare its effects with that generated in the country.

Unwilling to determine in a hurry, I procured matter from a London cow, conceiving it possible that the animal in this situation might generate matter possessing qualities differing in some measure from that which is more in a state of nature in our meadows here: but the result convinced me that the virus was the same, as 500 people were inoculated from this source without the appearance of any pustules. But this history, my lord, does not tell you by what means the pustules appeared at Petworth:—but it informs you how errors may arise, and how they may be persisted in. There is another source which I fear will be too common. Lancets are often carried in the pocket of a surgeon with small-pox dried upon them, for the purpose of inoculation. A gentleman some time ago sent a lancet here to have it charged, as it is called, with cow-pox matter: perceiving it stained at the point with some dried fluid, it was sent back; when he immediately recollected that his lancet was prepared with the matter of the small-pox. What confusion might have happened from this; and how narrowly we escaped it! For it was but an equal chance probably, that, had the lancet been used, a direct small-pox might have been produced; for the chance was equal whether it produced one disease or the other.

It may be necessary to observe, it is improbable that a mixture of the two matters used in this way would have produced a mixed disease, as two different diseased actions cannot go forward in one and the same part at the same time, so that the disease would have been either the perfect cow-pox or the perfect small-pox.

The matter which was made use of, I hear, came from Dr. Pearson; and doubtless Mr. Keate will have candour, and, I hope, industry enough to trace the error to its

source. That there was an error somewhere, of which Mr. Keate became the innocent cause, is a fact that I think will not admit of controversy. I have sometimes seen, perhaps in one case in a hundred, a few scattered pimples about the body, and sometimes rashes: but these have arisen from the inflammation and irritation of the arm, for it is very well known that many acrid substances applied to the skin, so as to produce local inflammation, will frequently occasion a similar appearance.

The cases of the boys your lordship describes infected by the matter I sent, were exactly those of the true cow-pox. Many hundreds of people of all ages were lately inoculated in a part of this county where the clothing manufactory prevailed, but not one of them lost a day's work, nor had they any pustules.

The inclosed virus is secured in a way that I imagine it cannot fail to infect, if Mr. Andrè will reduce it to a fluid state by moistening it with water on the point of his lancet previous to its insertion. When he has once infected a patient, he may afterwards go on to a certainty, as the fresh fluid matter is more efficacious than that which has been dried. The inclosed is just taken: it has borne a journey across the Atlantic, and been found perfectly good on its arrival.

* * * * *

To prove how anxiously he viewed the events which were passing at Petworth, he had scarcely dispatched the preceding letter, before he was induced to transmit another.

DR. JENNER TO LORD EGREMONT.

MY LORD,

I am almost ashamed to trouble your lordship again so soon on the subject of the cow-pox, but conceiving myself the general guardian of its inoculation, and my own reputation as being in some degree involved in the misconduct of others, the more I reflect on the late untoward event at Petworth, the more my anxiety increases. A thought has occurred to me, which, if your lordship will allow me to put it into practice, may clear up every doubt which has arisen in the minds of all parties respecting the late disaster. A comparison might be made on the spot between the inoculation of Mr. Keate and that of a person more perfectly conversant with the disease. My nephew, Mr. H. Jenner, of whom I have spoken in my publication as assisting me in the pursuit, would, if such a thing should meet with your lordship's approbation, set off at once for Petworth, and inoculate any number of people that might be willing to submit to it.

To add to my anxieties, I have heard from Lady C—— that the small-pox has been given to a domestic of her ladyship's for the cow-pox. But the matter, I find, was derived from the same source as that which was used in your lordship's family.

* * * * *

It was not thought necessary by his Lordship to avail himself of Dr. Jenner's offer, to send his nephew to Petworth. The gentleman who conducted the first inoculations with the matter furnished from London, also made use of that transmitted by Dr.

Jenner. The ensuing letter to Mr. Gardner announces the result of this comparative trial.

DR. JENNER TO MR. EDWARD GARDNER.

December, 1791.

DEAR GARDNER,

I am sorry the night was so unpleasant, and that your catarrh was increased by your journey home. I fear you fall too frequently into the common custom of seeking warmth after exposure to cold, which I am sure is a common means of both giving catarrh, and increasing the malady when present in a slight degree.

Great news from St. James's. The King has sent me a very civil message, so you will produce a *page* to wait upon his majesty and express the obligation.

From Lord Egremont I have also had a pleasant account. The matter I sent his lordship has dissipated all doubts and prejudices, he says, from the minds of the people around him. Forty have been inoculated with the virus, and all had the disease as I describe it. You must observe that fourteen had previously been inoculated with matter from Pearson, and ALL had variolous-like eruptions. Some were loaded with heavy burdens. But yet we must again review our observations on the pustular subject, for if I should produce them on any one patient, Pearson would triumph; and I must confess I don't see why cow-pock, though not small-pock pustules should not appear. I have seen one on a woman's forehead like the pustule on the arm, but smaller, and one on a girl's wrist. But more of this when we meet; and if you please, as your cold is not well, it shall be put off to Monday. Of this I will write by your messenger and apprize H. H.

I think the surgeon at Petworth who inoculated both sets of patients, mine, if I may call them so, and Pearson's, should publish immediately the result of the two inoculations. A letter in the newspapers would have a good effect, recommending the country to follow the example of London and Bath in forming general institutions for the gratuitous inoculation of the cow-pox. By this means the small-pox must soon hide its diminished head, and I could come forward to P——— with a good grace. What a triumph it would be if Gloucester would show a disposition to come forward! Trye would be at the head of the medical department. Do you know any of the leading people there who are not in ——— shackles?

I believe you will now receive the most material of the journals, &c. I will put any thing else in my pocket on Monday that I can find.

Yours truly,

E. JENNER.

The preceding letters are not dated; but I am enabled to prove by entries in his journals that they must have been sent off some time between the first of December and the twenty-fourth of that month.

Dr. Jenner was at the time living at Berkeley, having returned to that place from Cheltenham, with his family, on the fourteenth of October. While he remained, whether at Cheltenham or Berkeley, he was partly occupied in his professional affairs; but his correspondence, connected with the subject of vaccination, had so much increased as to leave him little leisure for other employment. He received many applications for cow-pox matter: and, as has been

already seen, had a great weight of labour thrown upon him in attempting to rectify mistakes which had been committed by others in the practice of vaccination. He was very careful in preserving the history of the virus that he sent out, and for the most part, likewise, transcribed with his own hand the letters of moment which he wrote at this period.

In the early part of December this year (1799,) he sent vaccine matter both to Berlin and Vienna; the first in consequence of an application from the Princess Louisa, of Prussia, communicated to him by Mrs. Colonel Walker. The second in compliance with the special request of Dr. De Carro.

The application for the Princess Louisa of Russia was replied to in the following letter.

DR. JENNER TO MRS. WALKER.

DEAR MADAM,

It would be highly gratifying to me to see the vaccine disease introduced at Berlin in the very respectable way you mention. I should be very happy to consign the matter to Her Royal Highness the Princess Louisa's Physician with every direction that could be conveyed through the medium of a letter, but yet on so important an occasion, it would be still more gratifying were I to be allowed to appoint a person to Berlin, whom I could with confidence recommend as perfectly conversant with the cow-pox in all its stages. My nephew, Mr. Jenner, who has assisted in conducting my experiments on the subject, and who has inoculated considerable numbers, would be very

ready to accept the embassy. But on mentioning this, perhaps I presume too much. My motive is the possibility of making a mistake.

In three or four days I shall be able to take some matter from a pustule that is ripening on the arm of a healthy boy. Sad confusion has been made in London, and in some other places, by the use of imperfect matter. Since my pamphlets were written, a vast deal of information has flowed in upon me, which, I am happy to say, all tends to establish the grand point, that the cow-pox perfectly secures the constitution from contagion of the small-pox. Five thousand persons have now been inoculated; the greater part of whom have been exposed to the infection of the small-pox by inoculation, and in every other way, without the least effect.

I shall very shortly republish what I have written on the subject, with an appendix. Whatever may be new or interesting in the appendix, I will transcribe for the satisfaction of the Princess, fearing it will not be printed so soon as you would wish to send it.

With respectful compliments to Colonel Walker,

I remain,

Dear Madam,

Yours, &c.

E. JENNER.

To prove how eagerly persons exerted themselves at this period to communicate to their neighbourhood the advantages of vaccination, I cannot refrain from mentioning the Rev. Mr. Holt, Rector of Finmere, near Buckingham. He had in the summer of this year been strongly impressed with the benefits of vaccination from a conversation with Mr. Aber-

nethy. This clergyman found no opposition to the introduction of the practice, because the people were not unacquainted with the virtues of cow-pox when caught in the natural way. The results of his experiments were communicated in a letter to Mr. Abernethy, dated Finmere, November 6th, 1799. The last named gentleman forwarded it to the Medical and Physical Journal, and it was printed in the number for December. Dr. Jenner was much gratified with the satisfactory information contained in it, as well as with the skill and caution evinced by the reverend gentleman, and expressed himself to that effect.

Dr. Jenner to Mr. Abernethy.

Dear Sir,

I thought of being in London long before this time, and to have called in Bedford-Row to have thanked you for your valuable publication and the very polite note that accompanied it, which I received on the eve of my departure from town in the spring.

I am happy in seeing that through you the cow-pock inoculation has already moved in a channel, which from being adopted, may expedite its general diffusion through this country. I allude to the paper of the Rev. Mr. Holt in the Medical and Physical Journal of the present month.

I should be extremely obliged to you to inform me from what source Mr. H. derived his matter. He speaks of pustules similar to those excited by inoculation, except that they were smaller. I have sometimes (though very rarely) seen a few pimples scattered over the body, which

for the most part have disappeared quickly; but I have sometimes known them remain long enough to show a little fluid at their apex. I have attributed them to the inflammation and irritation of the arm, as many acrid substances applied to the skin, so as to excite these effects, will produce similar appearances. They occurred so rarely that I have had no opportunity of investigating the nature of them; however, if their effluvia (provided in the first instance they have arisen from pure vaccine virus) should produce similar appearances, we may call the disease the small-pox at once. Indeed I have never considered the cow-pox and small-pox as distinct diseases, but the latter as a variety of the former.*

Excuse the trouble I give you, and believe me,

Dear Sir,

December 19, 1799. E. J.

* In a former chapter while illustrating the natural history of the Variolæ Vaccinæ I mentioned, that they had not appeared recently in a fatal form among the cattle, as they did in the days of Layard, and Ramazzini, and Lancisi. Since that portion of this work was sent to the press, I have received a communication which proves that even now it is sometimes fatal, and occasionally shows itself with some of its most malignant features. I could have wished to have inserted the information which I subjoin when endeavouring to sustain my general argument in Chapter Seventh, and several of those which precede. As however that cannot now be done I must place it in its present situation, conscious that it is well worthy of consideration on its own account; but especially so when it is remembered how strongly it corroborates the testimony of former writers, and sustains the doctrine which I have endeavoured to unfold.

Mr. Williams, of Dursley, was kind enough to procure for me the following statement; it was drawn up by Mr. Tiley, veterinary surgeon, who is well acquainted with the disease. It is

The conduct of one of the earliest and one of the most inveterate of the antivaccinists brought into the

supposed that the infection was conveyed to the cow that died, by a servant of a farmer named Stratford, who daily dressed a greasy-heeled horse.

"The beginning of May 1825, I was sent for to Mr. William Long's of Clinger, to see a cow that was very ill. It being, as I considered it at first sight, such an extraordinary case that I was at a loss to say what the real complaint was, as I had never seen one so affected before; but on examination I found it to be an aggravated case of cow-pox, and progressively arrived to the state it was then at. On my examining the teats I found several blackish scabs peculiar to the disease; and the whole skin, with the exception of no part of it from the base of the horn to the end of the tail, and to the hoofs, was one continued disease, not of vesicles nor scabs, but a discharge similar to that produced by a blister. Even the nose, and to the very edges of the lips, were affected the same as the other parts of the skin. Every symptom of violent fever was present; no attention having been paid to that previous to my seeing her: she lingered, and died the tenth day after I saw her. In the mean time I was employed to attend the other cows which were affected at the same time, then ten in number; and the same as I had seen the disease before; but every day brought newly-affected subjects till the whole pack, between forty and fifty, had the disease. The youngest of the cows, from two years old to five, were, more or less, affected about the skin (partially so) the same as the one that died. Till now I considered this disease in the cow to be topical. Constitutional remedies were employed; and every subject, except the first, recovered. One of Mr. Long's servants being asked by a neighbour of his to milk a cow for him that was rather obstreperous, which he did, and communicated the disease to the pack, which affected them in a similar manner. The whole of them did well. All the servants of Mr. L. had sore fingers through milking the cows, except one."

field an honest and indefatigable champion, who continued faithful to the last, and promoted the cause of vaccination as much by his personal efforts, as by his zeal and ability in overthrowing the arguments of its opponents. Dr. Moseley, physician to Chelsea Hospital, thought fit in a treatise on sugar to bring forward an irrelevant attack on cow-pox, and then gave his professional brethren a specimen of that elegant and classical phraseology which so peculiarly distinguished his subsequent lucubrations. His station, much more than the force of his argument, gave weight to his observations. He wrote in great ignorance of the subject; and with all the bitterness and prejudice that generally attend on ignorance.

Mr. Ring very successfully exposed and refuted his remarks. The doctor had seen in distant prospect an awful aggravation of human ills, from an admixture of bestial humours, which the cow mania, as he elegantly termed it, threatened to inflict upon our race. He even predicted an alteration in "the human form divine," and that another brood of minotaurs would overspread the land—

"Semibovemque virum, semivirumque bovem."

Mr. Ring's efforts to remove these apprehensions from the mind of the doctor, led to his forming an acquaintance with Dr. Jenner. Mr. Ring's own opinion on vaccination had at this period been somewhat modified by the publications of Dr. Pearson

and Woodville. Some time elapsed before these impressions were completely removed. When this took place, and when the full force of Dr. Jenner's accurate, perspicuous, and satisfactory details were confirmed and illustrated by his own experience, no one more truly appreciated the genius of the author of vaccination, or entertained a deeper feeling of respect and admiration for the great services which he had rendered to mankind.

From this time Mr. Ring devoted a great part of his professional life to the cause of vaccination. He investigated every adverse case that he heard of in London: he offered gratuitous vaccination to all who would accept it; and he marshalled the chief medical men in London who had satisfied themselves of its efficacy, by procuring their signatures to a testimony which I subjoin.

"Many unfounded reports having been circulated, which have a tendency to prejudice the public against the inoculation for cow-pox: We the undersigned physicians and surgeons think it our duty to declare our opinion that those persons who have had the cow-pox are perfectly secure from the future infection of the small-pox. We also declare that the inoculated cow-pox is a much milder and safer disease than the inoculated small-pox."

The above document bears the signatures of thirty-three of the most eminent physicians, and of forty distinguished surgeons of the metropolis, amongst whom are the well-known names of Baillie,

Vaughan, now Sir Henry Halford, Cline, Cooper, Abernethy, Lettsom, Willan, Garthshore, Maton, Lynn, Blair, Dundas, Good, John Pearson, James Moore, Saunders, Croft, Garnett, &c. &c.

The correspondence between Mr. Ring and Dr. Jenner commenced at a time when the eruptions generated at the Small-pox Hospital were the subject of much attention. A few of the letters which passed on this occasion may not be uninteresting here, although Dr. Jenner's sentiments on the origin of the eruptions have already been disclosed in his letters to Lord Egremont.

DR. JENNER TO MR. RING.

Cheltenham, 16*th August*, 1799.

DEAR SIR,

The very candid and satisfactory manner in which you have delivered your sentiments on the Variolæ Vaccinæ, cannot but be gratifying to the public in general, and to my feelings in particular. I write to express my thanks to you. At the same time allow me to make a few observations on the origin of the pustules which have appeared under vaccine inoculation, as this occurrence seems to have led you into an erroneous inference.

You observe that eruptions have appeared among those who have been inoculated in the country as well as in the metropolis, and also that the infection has been communicated by effluvia even from the inoculated pustule.

Let me call your attention to the source of the infection you allude to. It was that which was generated at the Small-pox Hospital. From the time I first heard that

pustules similar to the variolous had appeared among the patients inoculated there with the vaccine virus I strongly suspected, from a coincidence of circumstances, that by some imperceptible avenue the variolous virus might have crept into the constitution at the same time. Subsequent occurrences tend strongly to confirm this supposition. My last publication (Further Observations, &c.) was sent out before I could so fully decide on this important point as I can at present. Conceiving the London cow to be more out of a state of nature than the animal fed in the country meadows I could not say positively whether the virus generated by one or the other might not in some measure differ, and therefore was unwilling to decide until this had been ascertained by experiment. Some time in April the cow-pox appeared at one of the great milk farms in the neighbourhood of town. With this virus several patients in the country were immediately inoculated. The result was just the same as in my former experiments; that is, it produced the true cow-pox pustule on the part where it was inserted, but no secondary pustules; nor has a single pustule appeared in any one instance wherein the matter was taken from this source for the purpose of inoculation, and the cases now amount to more than seventy. From variolated pustules one cannot be surprised to hear that a disease has been communicated by effluvia. By no means that I could devise have I been able to infect a person by the effluvia of the simple cow-pock pustule, although I have tried several.

Among others, I have suffered children two or three times in a day to inhale by the mouth and nostrils the effluvia of pustules on the arms of others, when the matter has been in its most active state, and the pustules punctured in several places to give the matter its fullest effect.

There is another fact that strengthens the supposition

of the matter's being contaminated at the Small-pox Hospital. The variolous appearance among the patients is more and more retiring. Out of the last 110 cases Dr. Woodville remarks only seven had pustules.

The cow-pox then maintains its ground having nearly destroyed the co-operating effects of the small-pox.

And this event gives strength to what I have from the commencement of my experiments imagined that the latter is a malignant variety of the former; the parental root being the cow-pox. It is a little vexatious to find that so many should take up the subject, and give their decisions to the public without understanding it in the least; but after the castigation that one of these gentlemen has experienced from your hands I hope they will in future be more cautious.

I remain, dear sir,
with great respect,
Your much obliged and
obedient humble servant,
EDWARD JENNER.

MR. JOHN RING TO DR. JENNER.

DEAR SIR,

After your very polite attention to my former request I am really quite ashamed to be troublesome again so soon, but from fear of losing the matter I spoke so favourably of in my last, from want of a regular succession of patients—I had inoculated only two the last time, in both of whom the arm failed to inflame, so that my matter is now extinct.

I have inclosed a couple of lancets which I should esteem myself much obliged to you if you will arm with matter. I shall in future observe other precautions, and

preserve dry matter, not trusting so implicitly to the chance of inoculation taking place.

I am extremely indebted to you for your different communications. On this subject you will do me the favour to observe a profound silence. I sincerely thank you for your good wishes, but cannot indulge much hope of success, not having the least idea of writing on the subject till within three weeks; and scarce a leisure hour at any one time since.

If you will allow the Medical Society the honour of enrolling you among its corresponding members I shall be happy to propose you, when the fate of my dissertation is determined. Before that period it would create a suspicion of the author.

It must be delivered on or before the first of November.

I am, with much respect,
Dear Sir,
Yours most sincerely,
JOHN RING.

New-Street, Hanover-Square,
Oct. 25th, 1799.

DR. JENNER TO MR. RING.

DEAR SIR,

When I had the pleasure of receiving your letter there was no cow-pox matter here in a fit state to send you. That which is inclosed was taken about four days ago and, if soon made use of, will doubtless prove efficacious. This matter is from the source mentioned at the conclusion of my second pamphlet. It has been passing from one patient to another for upwards of six months, and except in the single instance I have mentioned, I have seen no pustules

produced by it: indeed, in that instance, they did not maturate.

It was my intention to have filled this sheet with some further observations on this singular disease, but I am called away, and do not like to detain the threads for another post.

I remain, &c.

E. J.

Sept. 18*th*, 1799.

Mr. Ring, Surgeon, New Street,
Hanover-Square, London.

Towards the end of this year attempts were made in different parts of the kingdom to diffuse the benefits of cow-pox by forming institutions for gratuitous inoculation, and for affording supplies of lymph to all who might apply for it. The city of Bath, under the suggestion of Mr. Creaser, was among the first to forward such a plan: but in London measures of a very peculiar nature had been adopted to set on foot a similar establishment. They were such as to place Dr. Jenner in a very embarrassing situation, and to give just cause of offence to all who considered what was due to him and to the public. Not long after he had left London (on the 14th of June) the gentleman who had promised to confer upon him a never-dying fame began to carry his purpose into effect. His first step was to form a vaccine board, of which the chief place was allotted to himself,—the inferior departments being also filled up in conformity with his wishes. The board, thus

constructed, received a degree of countenance worthy of a metropolitan charity: His Royal Highness the Duke of York having permitted himself to be named as patron. Lord Egremont also consented to hold an office in it.

Matters having been thus adjusted an account of the proceedings was forwarded to Dr. Jenner, from London, by the most conspicuous agent in this business. The terms in which the communication was made afford a very curious specimen of the writer's notion of *justice and liberality*. They also show that he set no small value upon his own labours, and the "*new lights*" which led him astray.

DR. PEARSON TO DR. JENNER.

London, Dec. 10th, 1799.

MY DEAR SIR,

I wish ever to be governed in life by the rule of doing justice; and, if I can, acting liberally to my fellow-labourers. I trust I have acted consistently to you; and, if I have differed in opinion on some points, it was because new lights broke in upon me; but I trust in such instances I, too, acted consistently and was more anxious to bestow commendation than to be studious to point out faults. Agreeably to my principle I now address you to say that we have made some progress in the institution of a charity for inoculating the vaccine pock. I do not know that I can confer any honour on you by proposing you (if I am able) to the directors of our establishment, nor do I well know what to propose to you. It occurs to me that it might not be disagreeable to you to be an extra corresponding

physician, and I can see no objection to this proposal at our meeting. The medical establishment consists of two physicians of the college, two consulting physicians, two surgeons, and three visiting apothecaries. We have got very high patronage, but the institution is not yet completely organized, nor will be so for some time. Rush, Keate, and his nephew, Gunning, Brande, Devaynes, belong to the medical departments. Exactly what Woodville will or can be, on account of his connexion with the Small-pox Hospital, I cannot tell: but he authorizes me to say in a letter from him, "that he wishes to give his assistance and promote the undertaking."

No expense is to be attached to your situation except a guinea a-year as a subscriber, and indeed I think you ought to be exempt from that, as you cannot send any patients: but you may depute some proxy in town. I confess I was surprised that you neither called nor sent to me for the last *two* months you were in town. However, if it was because you were so much occupied, I certainly excuse you. I hope you will excuse haste in this letter, but it will serve to assure you that I remain, with great consideration,

Yours truly,

G. Pearson.

Compliments of Mrs. P. and myself to Mrs. Jenner.

It will very easily be conceived that this letter, notwithstanding certain suspicions which had been excited concerning the conduct of the author, would occasion considerable surprise in the breast of Dr. Jenner. Mild, and generous, and humble as he was, he could not but express what he felt on the occasion.

He conveyed a just and dignified reproof to the writer in the following words :—

DR. JENNER TO DR. PEARSON.

Berkeley, Dec. 17, 1799.

SIR,

I received your letter of the 10th instant, and confess I felt surprised at the information it conveys.

It appears to me somewhat extraordinary that an institution formed upon so large a scale, and that has for its object the inoculation of the cow-pox, should have been set on foot and almost completely organized without my receiving the most distant intimation of it. The institution itself cannot, of course, but be highly flattering to me, as I am thereby convinced that the importance of the fact I imparted is acknowledged by men of the first abilities. But at the same time allow me to observe that if the vaccine inoculation, from unguarded conduct, should sink into disrepute (and you must admit, Sir, that in more than one instance has its reputation suffered) I alone must bear the odium. To you, or any other of the gentlemen whose names you mention as filling up the medical departments, it cannot possibly attach.

At the present crisis I feel so sensibly the importance of the business that I shall certainly take an early opportunity of being in London. For the present I must beg leave to decline the *honour* intended me.

I remain, Sir,

Your obedient Servant,

E. JENNER.

The reply to these remarks was, if possible, still

more illustrative of the writer's mode of conferring honour and immortality. As Dr. Jenner did not, I believe, deem it worthy of an answer I shall not present it to my reader.

While these transactions were going on Dr. Jenner was in constant correspondence with Lord Egremont. In one of his letters he alludes to the successful inoculations at Petworth with the vaccine matter he himself had furnished; and likewise to the new institutions which were forming in Bath and London. In reference to the latter he observes:—

"The new institution in London for vaccine inoculation, considered abstractedly, cannot but be flattering to my feelings; but many will scarcely believe that not the least intimation of the business was given to me until all was organized, and then Dr. Pearson in a letter burst the whole open to my view at once, and kindly offered me the post of extra corresponding physician!"

Dr. Jenner left Berkeley for London on the twenty-eighth of January, 1800, with his friend Dr. Hicks, by the way of Bath. His object was to forward the steps which were in progress in that place for diffusing vaccination; but more especially to give his personal attention to the strange proceedings which were carrying on in London and its vicinity. Immediately before he left the country he had occasion to reply to some of the statements which had appeared in the periodical journals re-

specting vaccine eruptions. He published a short letter dated from Berkeley, January 13th, 1800. The last sentence of this letter was to this effect. "Time will develope the mystery before us: at present I very much suspect that where variolous pustules have appeared variolous matter has occasioned them." Not long after this period he published a continuation of "Facts and Observations relative to the Variolæ Vaccinæ," in which, with admirable precision and moderation, he entered upon the questions at issue between himself and Drs. Pearson and Woodville.

In this work he observes that he cannot "feel disposed to imagine that eruptions similar to those described by Dr. Woodville have ever been produced by the pure uncontaminated cow-pock virus; on the contrary, I do suppose that those which the Doctor speaks of originated in the action of variolous matter which crept into the constitution." Although observations of this kind had been made by Dr. Jenner to Dr. Woodville long before he published his "Reports," and although they were repeatedly brought before him subsequently, he did not express (whatever he might have felt,) any of the indignation which he permitted himself to disclose when the same facts appeared in print. He did not notice them in his "Reports," and continued apparently in friendly intercourse with Dr. Jenner till the publication of the third pamphlet, which contained the observations above quoted. In July

1800, Dr. Woodville sent forth his Observations on the cow-pox, which he inscribed in a harsh and angry address to Dr. Jenner. I will not perpetuate the remembrance of his unjustifiable severity on this occasion, by recording his language. It excited no hostile feeling in the breast of Jenner; and it was freely forgiven when the first opportunity of reconciliation presented itself.

Dr. Jenner arrived at Adam Street, Adelphi, on the thirty-first of January, 1800. One of the great objects of his journey to London having been to deliberate with Lord Egremont and his other friends respecting the establishment of a Vaccine Institution he wrote the following letter to his lordship soon after his arrival.

DR. JENNER TO LORD EGREMONT.

MY LORD,

I am just favoured with your lordship's letter, and feel extremely obliged to you for the friendship with which you honour me. I should be happy to profit by your lordship's advice in an affair wherein not only my own future happiness, but that of society, is much involved. Dr. P—— has certainly dealt very unhandsomely by me, and has convinced me by his conduct that I can never more have any private concerns with him: but before a new arrangement is made for vaccine inoculation, I hope to have the satisfaction of seeing your lordship at Petworth. Mr. L. visits your lordship on Sunday, and I hope to accompany him. I have looked forward to the honour of an interview which, I trust, will produce a plan from which

this country may derive the advantages of the new antidote for the small-pox.

* * * * *

The new institution was a subject of considerable interest with many individuals of the highest rank, who had acquired a knowledge of the benefits of vaccination, and who, with the most benevolent and praiseworthy feeling, wished to lend the sanction of their name and station in diffusing them as widely as possible. In doing this they were certainly not aware that the disinterested author of the practice was likely to suffer any wrong; or that the doctrines which he established, and on which the safety and success of the practice rested, incurred any risk of being misunderstood or perverted either from ignorance or design. In fact, the establishment, according to its original plan, could not have been carried into execution without impugning these doctrines in a manner the most objectionable in itself and peculiarly offensive to Dr. Jenner. It tended immediately to place in the most conspicuous and commanding situation those who questioned the truth of his statements in the most material points, and who made their own fatal mistakes the ground of difference from him. These things were certainly not at first understood either by the patron or the president of the institution. His Royal Highness the Duke of York, with his characteristic attention to those under his command, had recommended the practice of vaccination in the army. Being, therefore, well aware of its advantages he did not hesi-

tate, on application being made, to give the high authority of his name to an institution ostensibly designed to promote that practice. Other members of the royal family, the Duke of Clarence more especially who had more time to devote to such matters, at a very early period saw through the injustice of the proceedings and very plainly delivered his sentiments on the subject to some of the individuals chiefly concerned. He likewise desired that Dr. Jenner might be introduced to him on his arrival in London.

This introduction took place early in February. On this occasion Dr. Jenner had the honour of a long conference with his royal highness. That conference related to the subject of vaccination in general, but was more particularly directed to the means of diffusing the benefits of cow-pox inoculation as widely as possible. Dr. Jenner's own views on that subject were very clearly conveyed to his Royal Highness; and they were subsequently communicated to Lord Egremont.

PROPOSALS BY DR. JENNER FOR A PUBLIC INSTITUTION FOR VACCINE INOCULATION.

(FOR LORD EGREMONT.)

Having now pursued the inquiry into the nature of the cow-pox to so great an extent as to be able positively to declare that those who have gone through this mild disease are rendered perfectly secure from the contagion of the small-pox; and being convinced from numberless in-

stances that the occupations of the mechanic or the labourer will meet with no interruption during its progress, and the infected and uninfected may mingle together in the most perfect safety, I conceive that an institution for the gratuitous inoculation of the lower classes of society in the metropolis would be attended with the most beneficial consequences, and that it might be so constituted as to diffuse its benefits throughout every part of the British Empire.

EDW. JENNER.

London, March 16*th*, 1800.

In order to diffuse the advantages of the institution for promoting the inoculation of the cow-pox as widely as possible, it is proposed:

1st. That communications be made to the principal medical gentlemen in London and throughout the British Empire, acquainting them with the nature of the Institution and soliciting their associating as honorary members.

2dly. That a Physician be appointed who shall superintend the medical department.

3dly. That a house be appropriated in some convenient part of this metropolis containing the necessary apartments for a medical attendant, a secretary, porter, &c. Apartments also for the reception of the patients sent for inoculation, and for the occasional reception of those who may choose to aid the charity.

4thly. That virus for inoculating the cow-pox be sent to all such honorary members as may make a proper application for it at the apartments of the Institution, and that none be sent forth without the signature of the superintending Physician as a test of its being genuine.

5thly. That the virus be accompanied with directions for its use, and (to guard against error) with some general observations on the nature of the disease.

6thly. That the Institution be supported by voluntary contribution.

7thly. That an annual subscriber of
be a Governor.

8thly. That the Governors meet at the apartments the first day of every month for the inspection of the reports relative to the general progress of the inoculation, &c. &c.

9thly. That an abstract of the reports be published as often as it may be deemed proper.

On the 15th of February Dr. Jenner had an opportunity of discussing the subject more fully with his lordship, he having on that day gone to Petworth with his friend Mr. Ladbroke. He remained at this splendid mansion of his noble host till the 24th of the same month. During his stay he was much gratified with the personal attentions he received, but still more with the ability and zeal displayed by its distinguished owner in making himself acquainted with all the details of vaccination, and by investigating the origin of those disastrous occurrences which, for a season, so much obscured its character.

The trials made under his lordship's eye with the matter furnished by Dr. Jenner happily removed every doubt as to the accuracy of his description of the disease, nearly two hundred persons having been inoculated before he left Petworth, without *one* deviation from the ordinary course having taken place.

On the 25th of this month he received a message from His Royal Highness the Duke of York desiring an interview. That interview took place on the 1st

of March. Mr. Knight was present. On this occasion the subject of the vaccine institution was very fully discussed, and received the greatest consideration from His Royal Highness. From this period up to the 17th a great deal of correspondence took place between the officers of the new institution and the eminent individuals who had promised to patronize it. The main object of these negotiations was to vindicate the conduct adopted towards Dr. Jenner; to hold out additional offers of conciliation to him; and to prevent, if possible, that secession from the institution which was anticipated by them on the part of the royal Patron, and of the noble President.

Some of Dr. Jenner's friends were, at one time, inclined to think that he still might connect himself with the institution on certain arrangements being made. His own temper and feelings always inclined him to make concessions, and he certainly would have done so on this occasion had his personal feelings been alone concerned; but the conduct of the individuals who framed the institution proved that the cause of vaccination could not be safely committed to their hands; and that an establishment, which had been organized as this was, could not receive his sanction without his appearing to abandon those truths which he had advanced respecting the nature of Variolæ Vaccinæ. No success could attend a coalition of this kind. The misrepresentations which had been published and the blunders which had been committed had already too much endan-

gered the safety of the new practice; and even a slight consideration of what had been done in these respects could not fail to show the impropriety of requiring Dr. Jenner to give them any countenance by co-operating with persons who still continued to uphold sentiments directly opposite to his own. These reasons, which satisfied his own mind, proved in the end equally influential with his friends; and Dr. Jenner was informed by Lord Egremont at an interview on the 17th that both his lordship and his Royal Highness the Duke of York had resolved to withdraw from the institution altogether.

Dr. Jenner's firmness and prudence in this affair gave unqualified satisfaction to his friends; and supported as he was by the handsome and efficient interposition of Lord Egremont, he was enabled to defeat the ambitious designs of those who sought for high patronage in proceedings of a very questionable nature. It is not my wish to dwell longer on this unpleasant topic: and I have abstained from printing many of the documents from which the preceding facts have been drawn: indeed I would gladly have passed them by altogether had not the character of Dr. Jenner, and still more the character of vaccination, been materially affected by them.

It certainly was the feeling of all those elevated personages who wished to assist in forming a vaccine institution that none could be established which did not assign to the author of the discovery that situation of dignity and influence which was due to

his merit, and which would enable him to direct the practice with vigour and effect. This feeling was strongly evinced when the Royal Jennerian Society was formed; and it was also very characteristically expressed at this time by his friend the late munificent Mr. Angerstein. He said "*that he would not mind a subscription of one hundred or two hundred pounds in an institution organized by the man who was best competent to set about it, but that he would have nothing to do with one grafted on the present blunders.*"

All Dr. Jenner's medical friends of the first consequence in London cordially recommended and approved of the steps which he took, and although they could not subscribe so largely as Mr. Angerstein, this test of their sincerity was not wanting on their part.

Dr. Jenner had also the gratification of knowing that those who were most distinguished in the profession had no part in these blunders, and that all whose good opinion he most valued really *did* appreciate both the scientific character of his inquiries, and the splendid practical results to which they led. A letter from a British philosopher, alike eminent for the extent and accuracy of his knowledge and the originality and depth of his genius, embodying these sentiments forms a striking contrast to the vague and unsatisfactory correspondence which he had with some other of his medical brethren: I therefore gladly introduce it here.

Dr. Wollaston to Dr. Jenner.

1800.

Sir,

I return you many thanks for your observations, and with them beg leave to propose one question for your consideration.

You have proved to the satisfaction of every candid person that there is a disease of the very mildest kind communicated by inoculation, which perfectly secures the constitution from the small-pox.

You have ascertained that unless great precaution is taken in procuring the fluid for inoculation a disease of a more violent kind, and in no degree beneficial, may be produced.

You have described the appearance which the fluid for inoculation ought to have, and have named a period (earlier than in small-pox) beyond which it cannot be depended upon, on account of the changes which it may have undergone; but you have left it for future experience to determine on what that change depends.

Query. Does not this change depend on that species of erysipelas which produces the blushing areola?

May not this erysipelas supersede the action of the vaccine virus although it be incapable of subduing, but is only superadded to, that of the variolous?

The disease produced by degenerated matter appears, conformably to this hypothesis, erysipelatous.

You may possibly have seen reason to form a different opinion in the course of your practice, or from that of Mr. D. (page 30 of your "Farther Observations,") who took matter from an arm in this state.

If, on the contrary, this conjecture be well founded, how soon can this cause be supposed to operate?

Does the areola ever take place earlier than the tenth day, as appears to have been the case, page 26 of your "Continuation," &c.?

Has a transparent fluid ever produced a wrong disease if taken before the blushing areola began to appear?

In submitting these queries for your consideration believe me influenced by unfeigned respect for the author of the most valuable communication ever made to the public, and permit me Sir to subscribe myself,

Your very humble Servant,

W. H. Wollaston.

In a former letter Dr. Jenner alluded playfully to "great news from St. James's." This expression referred to the King's gracious permission to him to dedicate the second edition of the "Inquiry" to his Majesty; and to his reception at the palace.

On the 7th of March he went to St. James's with Lord Berkeley, and presented his treatises on the cow-pock to the King: his Majesty received him very graciously.

In allusion to this intended ceremony he writes thus to his friend Mr. Shrapnell, who was then at Cranford in attendance on Lady Berkeley. "Pray acquaint Lord Berkeley I shall be ready to accept his kind offer of accompanying me to St. James's any day he may appoint in the course of the week after this. The work will then be finished, and clad in crimson. What will you give for a sight of me

all in velvet, girt with a sword too? What a queer creature is a human being!"

Towards the end of this month he also had the honour of a private interview, at Carlton House, with his Royal Highness the Prince of Wales. He was introduced by the secretary the late Sir John M'Mahon, Bart. His Royal Highness on this, as on every other occasion, received him with marked respect; and at future periods showed the interest he felt for the cause of vaccination, by the personal efforts which he was pleased to make for its advancement.

Dr. Jenner's time in London was very fully occupied in visiting his professional friends, and in attending to the daily increasing importance of vaccination. To one of his correspondents, Mr. Shrapnell, at this period he says, "I have not made half my calls yet in town, although I fag from eleven till four." To the same gentleman he thus expresses himself in reference to the progress of vaccination. "Pray write without delay to Tierney, and tell him how rapidly the cow-pox is marching over the metropolis and, indeed, through the whole island. The death of the three children under inoculation with the small-pox will probably give that practice the Brutus-stab here, and sink for ever the tyrant small-pox. Would Tierney like to have a little virus, that the cow-pox inoculation may be set going under his own eye at Edinburgh? I should be happy to furnish him.

Let him know that my new edition mentioning his name, with the appendix, is published. A very little attention would place the practice in its proper light in Edinburgh, a thing devoutly to be wished."

Soon after this Dr. Jenner received two letters from Mr., now Sir Matthew Tierney, Bart., which delineates the state of professional feeling at Edinburgh at that time.

M. J. TIERNEY, ESQ. TO DR. JENNER.

No. 2, Fisher's Drummond Street,
Edinburgh, 21st March, 1800.

DEAR SIR,

In a letter I lately received from Mr. Shrapnell I with much pleasure find the attention paid to your (I must say valuable) *discovery* of the vaccine matter. I beg leave to congratulate you on the advantages it is likely to bring to society, and the honour, so justly merited, you received yourself. I presume he informed you of the state in which it is here. Not knowing much of its effects its real value is not yet attended to. Dr. Gregory the Professor of Physic here knew very little about it, and of course did not encourage it. I gave him the sum of my experience on it, and he now seems to entertain more favourable opinions of it. Indeed, he did me the unwished-for honour of reading my accounts to his class. Since then, the students here seem anxious to see and know the disease better. A Mr. Anderson, a surgeon at Leith, is the only person *here* who has tried it, and his accounts are strongly favourable.

From the conviction I have of its advantages I think it a duty I owe to society at large to extend it as much as in

my power: and on this account many of my friends here have earnestly solicited me to get some of the matter, not that I expect to have an opportunity of using it myself here, but conceive it may be a *second* focus from which it may extend itself more and more rapidly.

As you know how fond of variety all young medical men are, with this intent and as Mr. Shrapnell tells me, you would be so good as to send me some of the matter and, as coming through you, every suspicion of error would be done away, I am the more anxious to have it from you and shall feel much obliged if you send me some as soon as possible. A friend of mine proposes giving in a paper on this disease to the Medical Society, the greater part of which I shall contribute to, not having an opportunity of writing myself. This too may be a further means of extending it, as it wants no more but to be known and received by every medical man. I regret very much that during my absence from the regiment many of the men were inoculated, and I have not had an opportunity of attending to them. It is surprising it is not universally adopted in the army. The advantages from it are self-evident.

M. J. Tierney, Esq. to Dr. Jenner.

No. 2, Fisher's Drummond Street,
Edinburgh, 15th April, 1800.

Dear Sir,

I can with much satisfaction address you now, and am sure the success of the first introduction and the advantages likely in a very short time to result from the vaccine virus *here* will be the pleasantest acknowledgement for your last kind favor.

In my former you were informed that it was very little attended to here: but on receiving the matter from you I mentioned it to Dr. Gregory, (Professor of Practice of Physic) and with his usual liberality of mind and to show his confidence in my former statement, he wished me to inoculate *his* youngest child who is ten months old, and even teething. I did so, and have now the satisfaction to say the disease has gone through its stages even milder than any I saw before. This is the thirteenth day since inoculation. The inflammation is much reduced, and I have no doubt the puncture will get well without further trouble. Nothing was done either in regimen or application to the part. So mild was the constitutional irritation that the Doctor *himself* could not say whether it may not be occasioned by teething. This you will most readily see is the most effectual mode of spreading the disease here, and in fact it has already had that effect; many persons applying to have their children inoculated with it. Mr. Anderson of Leith, whom I mentioned in my last, is the only person who attended to the disease. He inoculated, since May last, 150 persons in all of whom its progress was much *milder* than it has been observed to be in England; but he has observed some curious phenomena in its progress, having had three children at different times under its influence, whose cuticle was abraded in different parts of the body; in one by a prior eruption on the back. He observed pustules to appear on those parts, from which he took matter and produced the disease in others with it. In *no* case where the cuticle was sound did he observe pustules or eruptions. I asked him, *naturally*, if it was not possible the matter from the puncture might have been applied to these parts in dressing or undressing the child; but he seems to think this could not be the case. He never had occasion to apply

the mercurial ointment, and on the whole, his accounts are even *more favourable* than any others I have heard. He further says (which by the by is a considerable advantage) that the prejudice of the people against the vaccine disease is *much less* than against the inoculation with small-pox. In this country religious opinions direct the people a great deal.

Its being received by the Professors here will certainly be a means of spreading it more rapidly, and I flatter myself this is now established.

* * * * *

At the formation of the Bath Vaccine Institution Dr. Jenner wrote to his friend Lord Somerville to request his acceptance of its presidentship. His Lordship, who was then in Lisbon, gave his assent in a letter dated 4th March.

On the 27th of the same month Dr. Jenner went to St. James's Palace, to the Queen's drawing-room, when he had the honour of being presented to her Majesty by her chamberlain the Earl of Morton. Her Majesty, on this occasion, asked him many questions relative to the progress of cow-pox; and received him with marked attention.

On the 12th of April Dr. Jenner received, whilst in London, some matter which had been generated on the cow by inoculation with the virus of *grease* by Mr. T. Tanner. Some part of this matter he transmitted to Mr. Wachsel, of the Small-pox Hospital.

On the 15th of the same month his Royal Highness the Duke of York sent a message to Dr. Jenner

to request him to go to Colchester to vaccinate the 85th regiment. He could not himself obey this request, but he dispatched his nephew George Jenner, who set off on the 25th. He could scarcely have entered upon an undertaking more annoying to himself or more inauspicious to the character of vaccination than he encountered in his attempts to vaccinate the 85th regiment. He was under the necessity of waiting a considerable time before he could communicate the disease to any one. He found the whole of the regiment, together with the women and children, labouring under the itch. He commenced his inoculations, but they all proved unsuccessful. On the 2nd of May he found that one child had taken the cow-pox, and he adds that "all the men are cured of the itch, and in two days will be washed and fit for inoculation." These anticipations proved rather premature, for he observed on the 13th of May that he could not succeed in communicating the true cow-pox to those whose constitutions had been under the influence of the itch.

It appears to me of moment to allude to these occurrences, because they afford very convincing proofs of the truth of a doctrine which Jenner subsequently adopted and invariably maintained to the last hour of his life, namely, that any cutaneous disease, however slight in appearance, was capable of interfering with the regular course of the cow-pox and of preventing it from exercising its full protecting influence.

The occurrences at Colchester ought to have great weight, and to induce medical men to pay more attention to his directions on this subject than they have hitherto done.

Though Dr. Jenner could not himself undertake to vaccinate the regiment at Colchester he went twice to that place to inspect the progress of the practice.

Although the practice of vaccination encountered no active popular hostility at its commencement, there were, nevertheless, some instances in which prejudice and ignorance led the lower class to manifest their feelings in a violent and intemperate manner. Mr. Gooch communicated some curious facts of this kind, and gave evidence, at the same time, of his own zeal, as well as that of his lady, in forwarding the practice.

T. S. Gooch, Esq. to Dr. Jenner.

Holbecks, Hadleigh, Suffolk,
April 24th, 1800.

Sir,

Having understood from Lady Peyton that you are always pleased to hear any communication on the cow-pox I trouble you with a remark or two on what has happened to our patients under that disorder. Mrs. Gooch and myself have inoculated 611 persons with cow-pox virus, and have not had one patient whose arm has been at all sore, so as to require any application to it.

I see by your last publication you suppose it impossible

for a person inoculated with the pure *uncontaminated* cow-pox virus to have pustules; I beg leave to mention on that subject that we have had six people with evident pustules, from which we might have inoculated. Two of them had pustules on the eye, and four on the inoculated arm near the elbow. We have had a proof of the possibility of one person inoculating himself accidentally by rubbing his eye on the arm of another under the disorder; therefore the pustules on the eyes may have been owing to this. We inoculated five persons in one family; two others of this family took it in an extraordinary manner; viz. one by sleeping in the same bed, and rubbing its eye on an infected arm; and the other was inoculated by its brother, a child of five years old, who did it by a scratch of a pin on which he had put matter.

We had our virus from Mrs. Gooch's sister, Lady Rous, who had it immediately from you.

I am happy to inform you that in spite of all ignorant prejudice, and wilful misrepresentations, this wonderful discovery is spreading far and wide in this county. The first people we inoculated in Hadleigh were absolutely pelted, and drove into their houses, if they appeared out; we have now persuaded our apothecary to inoculate the whole town (7 or 800 persons) and our hundred-house is now under inoculation (about 350 persons.) A physician at Ipswich, Dr. Hamilton, has taken it up in a very liberal manner and is extending it very much. I beg pardon for troubling you so much, and am, Sir,

Your obedient humble servant,

T. S. Gooch.

From this time till the period when Dr. Jenner left London he continued actively engaged in pro-

moting the cause of vaccination, by conferences with his medical brethren; by discussions at the medical societies; and by attending those public meetings where it is so usual to forward measures of general interest and utility. His presence on such occasions always afforded an opportunity of introducing the subject of his discovery. The effect of proceedings of this nature is very considerable in this country, where they are generally reported in the newspapers and thus are speedily diffused over the kingdom. He had interviews with many noblemen on the subject, and received from them strong marks of attention and respect. Amongst those who took a more especial interest in this matter may be mentioned Lord Hervey and the Earls of Aylesbury and Ossory. He was also consulted by many of them professionally, and was likewise employed in vaccinating their children.

Dr. Jenner left London with his nephew George, and his man Richard, on the twenty-third of June. They slept at Buckingham and arrived the next day at Tusmore, the seat of his friend William Fermor, Esq. where he dined. In the evening he went to Oxford. The following day he was introduced to Dr. Marlow, the Vice-Chancellor of the University. He also had intercourse with Dr. Wall, Chemical Professor; Dr. Williams, Regius Professor of Botany; Sir Christopher Pegge, Reader in Anatomy; and Mr. Grosvenor, Surgeon to the Radcliffe Infirmary. These gentlemen on this occasion

signed the following testimonial drawn up by Sir C. Pegge :—

" We, whose names are undersigned, are fully satisfied, upon the conviction of our own observation, that the cow-pox is not only an infinitely milder disease than the small-pox but has the advantage of not being contagious, and is an effectual remedy against the small-pox."

He quitted Oxford on the twenty-seventh, and arrived at Berkeley on the same evening.

CHAPTER X.

INTRODUCTION OF VACCINATION INTO AMERICA, FRANCE, SPAIN, MEDITERRANEAN, CONSTANTINOPLE, BAGDAD, BOMBAY, &c.

WHILE Dr. Jenner was thus employed his discovery was making rapid progress throughout the world. Early in the year 1799 his first work reached the shores of North America.

Dr. Lettsom transmitted a copy of it to Dr. Waterhouse, Professor of the theory and practice of Physic in the University of Cambridge, Massachusets. The tidings of Dr. Jenner's discovery were received in America very much in the same manner as they had been in other countries. A judicious few at once felt and acknowledged the strength of his facts and their important consequences. Some doubted, others abstained from expressing any opinion; whilst the greater number treated the whole subject with ridicule. Dr. Waterhouse was not slow to estimate the advantages of the discovery. It is my duty, therefore, not merely to record his

services, as the first who made known the blessings of vaccination to his countrymen, but likewise to speak of him as the firm, consistent, and ardent admirer and friend of Jenner. In the year 1800 a correspondence commenced between them which was kept up with increasing interest and attachment till nearly the close of Dr. Jenner's life.

As in the New World the ordinary method of making known discoveries, even in medicine, was through the medium of the newspapers, Dr. Waterhouse published in the Columbian Sentinel of March 12th, 1799, a short account of the cow-pox. The article was headed "SOMETHING CURIOUS IN THE MEDICAL LINE." Not long afterwards he brought the subject before the American Academy of Arts and Sciences. The illustrious President of the United States, John Adams, who was likewise President of the Academy, was at the meeting and received the communication in a manner worthy of an individual who had proved himself alike capable of directing the resources of a great and free people, and in promoting the advancement of every useful art and science.

After several unsuccessful attempts to obtain cow-pox matter from England Dr. Waterhouse at length succeeded in getting some from Dr. Haygarth, of Bath, who forwarded it from Bristol. It was procured from Dr. Jenner's stock by Mr. Creaser. With this matter he inoculated seven of his own children, six of whom went through the disease in the usual

manner. In order to confirm the doctrine of its prophylactic powers he resolved to have them inoculated with small-pox matter in the most public manner. With this intention he wrote to Dr. Aspinwall, physician to the Small-pox Hospital in the neighbourhood of Boston, requesting him to perform the experiments. This gentleman assented to the proposal. Three of the children were sent to the Small-pox Hospital. One of them, twelve years old, was selected for the trial. Active small-pox matter was inserted by two punctures: an infected thread was likewise drawn through the skin, and the patient then left in the Hospital. On the fourth day there was some slight appearance of infection; but it died away, and left no traces of its action.

The successful vaccinations in Dr. Waterhouse's family soon turned the tide of popular feeling in favour of cow-pox. The zeal of the medical men was excited to an unparalleled degree; but, unfortunately, their discretion did not keep pace with it. They disregarded the cautions of Dr. Waterhouse, and paid no attention either to the state of the matter with which they inoculated or to the progress of the pustule. It appears, likewise, that the cupidity of persons not of the medical profession was stimulated on this occasion, and the manner in which they carried on their traffic was alike indicative of their avarice and their ignorance. The followers of this trade obtained the shirt-sleeves of patients which had been stiffened by the purulent discharge from