

An essay on the bite of a mad dog, in which the claim to infallibility of the principal preservative remedies against the hydrophobia is examined / [John Berkenhout].

Contributors

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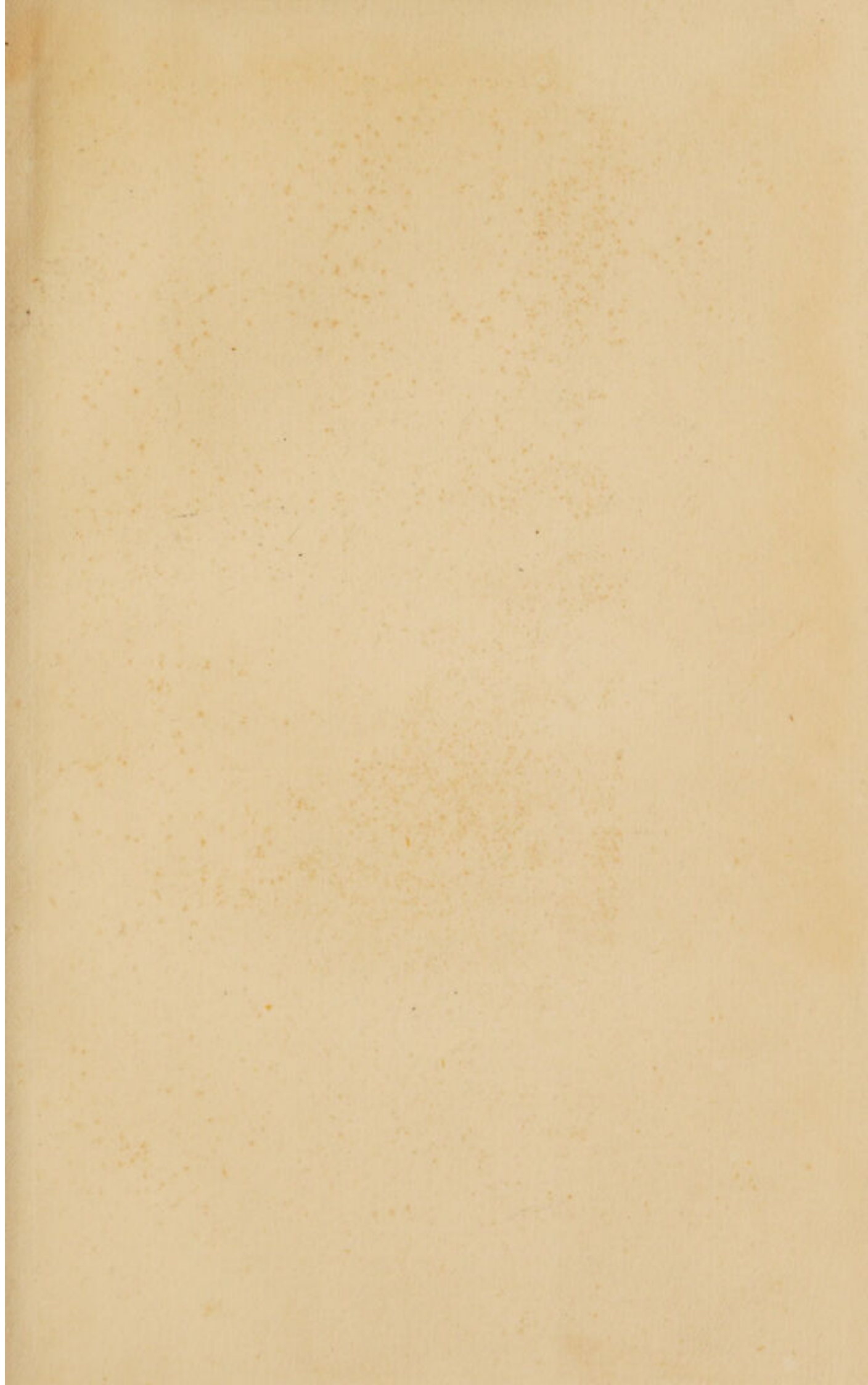


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Essay on the bite of a mad dog

1. J. Foot. 1788
2. J. Berkenhout 1783

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AN
E S S A Y
ON THE
BITE OF A MAD DOG;

WITH OBSERVATIONS ON
JOHN HUNTER'S TREATMENT OF
THE CASE OF MASTER R—.

AND ALSO,
A RECITAL OF THE SUCCESSFUL TREATMENT
OF TWO CASES,

BY JESSÉ FOOT, SURGEON.

RIEN N'EST BEAU, QUE LE VRAI.—VOLTAIRE.

L O N D O N :

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WALES, DUKE OF YORK, AND THE PRINCES.

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T O

PERCIVAL POTT, Esq. F. R. S.

&c. &c. &c.

S I R,

PERMIT me to solicit your sanction to the following Essay, and to return you my sincere thanks for the great advantages which I have derived from all your works in surgery. You have not only adorned that art by your publick Lectures, but advanced it to high perfection. Your writings and method of practice will be lasting, because they have their foundation in truth. Your cases will be ever true to nature, because they were given by a man of honour and discernment. To your active and comprehensive mind, to your long and extensive experience, to your nice respect for the useful observations of the ancients, to your dili-

diligence in selecting from them, whatever was valuable, surgeons in particular, and mankind in general, owe the greatest obligations. You scorned to be defective in candour, when you aimed to be perfect in knowledge. May you long enjoy your natural vigour of mind, and feel a calm repose under the benign shade of laurels that surround you; and may your future days be as exquisitely happy, as your past have been eminently useful.

I am, Sir,

Your sincere friend,

And obliged humble servant,

JESSÉ FOOT.

Dean-street,

May 20, 1788.

A N E S S A Y

ON THE

BITE OF A MAD DOG, &c.

IN compliance to custom, I shall continue to call the disease brought on the human subject from the bite of a mad animal; Hydrophobia; notwithstanding Doctor Mead hath remarked, and with strict propriety in my opinion, that the word does not convey the true meaning of the effect of water upon the patient, when this frightful symptom is upon him, which is not a dread of water, but despair of gratifying thirst, through the impossibility of swallowing it.

It has been also remarked by the same author, that there are other diseases, although in a more partial degree, in which this same difficulty in swallowing is observed.

I believe that there are very few men who have thought on this subject, either with a view to medical utility, or from a recent instance of some melancholy case having come before them, but what must be impressed with such feelings upon the occasion, as are dreadful to conceive, and painful to express.

And although it might happen, that from the covering which is worn, and some accidental causes, not more than one in ten of those bitten by a mad dog receive the infection; yet the hazardous condition that all continue in from the moment of the wound being inflicted, to the utmost limitation that even fabulists report of the dormant state of the venom, must be an interval of horror not to be envied by such as are devoted to
decimation,

decimation, or by a wretch in a dungeon sentenced for execution. Yet this interval of fatal apprehension hath been filled up by a hope that, however false, hath smothered despair, and lulled the senses into a fallacious security.

This will enable me to explain to my readers what would otherwise appear an inexplicable phenomenon. It will also afford me the pleasing gratification of taking off a stigma, which would otherwise stain the fair fame of the first medical characters, from the earliest ages down to the present times, who have with uncommon zeal published their opinions upon this disease, and who have each given into some favorite medicine for the prevention of it. One medicine hath been ushered into reputation with flattering applause, and hath continued its influence, until by the failure of it, it was abandoned by credulity, and turned out of practice to make room for the succession of another and another.

How is it to be explained that such a character as Mead, for instance, and some before his time, men famed for professional skill and honour, beyond all power of suspicion, should have been so far deceived, as to deceive others, in giving to the publick a prophylactick medicine to infallibly prevent the effects of a bite from a mad dog, which in the event hath proved inadequate to that end, and is not to be trusted?

Most of these eminent men who have written upon this subject were actuated from the spur of the occasion; they had been called to a few cases where the symptoms of hydrophobia were actually upon the patient; they had convinced their understandings of the inevitable fate that uniformly awaited such as were arrived at this dreadful stage; and not being able to afford the least relief, they aimed to make a stand against the disease on its first approach, judging that they could destroy that in embryo which was acknowledged by all to be out of their power, when once the evil was ripened

ripened to maturity. They were not also then aware, as we now are, that so few received the infection in proportion to the many that were bitten by dogs really mad, not to mention some that were also bitten by dogs only supposed to have been so. Being themselves at a loss for a remedy, they either adopted that which came the strongest recommended to them, as Mead did the powder of Dampier, or, upon bare probability alone, offered something of their own. Grown confident from the success of so many escaping the fatal effects, they attributed that virtue to the medicine which it had not, and were induced to give their sanction to that which they deemed infallible, upon the purest motives. Nor had they an opportunity perhaps, who were so generously disposed, in the course of their life time to be convinced of their error and to retract the practice of it. For it is a fact, not unpleasing to be told, that the instances of those really infected, all of whom infallibly die, are in comparison to the numbers bitten few and scattered; and many a medical
man

man of extensive practice passes through life with having been an eye-witness to no more than one, or perhaps to not a single case.

Such hath been the cause, why the hope from various medicines, which flattered in prospect, disappointed in the end. Such hath been the ill success of the great characters which I allude to, that they only kept their reputation, because they honestly attempted to increase it. And such is our ignorance of the nature of this disease at present, that, with very insignificant exceptions, we have not gained a point of our ancestors two thousand years ago. We remain in utter darkness, and if there be any thing in future to be hoped for, it must be obtained by beginning de novo, by adopting a new system, by substituting analogy for blind theory, and by making our advances upon the more solid grounds of comparative experiments. By these exertions we may aspire to essential truths, and acquire that substantial information which
will

will stand the test of reason, and which will be received only as a positive good, by its positive success.

It might be a gratification expected from me, conformable to the general practice of other writers on this subject, to explain to my readers the voluminous essays of those who have gone before me, for the information of some, and for the curiosity of others. Although I do not mean to be either minute or digressive, I shall not wholly spare myself that labour, because I deem such enquiry in some measure conformable to the intention that induced me to write. For if it be necessary to urge mankind to set aside what has been already attempted and failed of its purpose, it is a justice due to the understanding, that what has been done, should be known; for this is a subject, upon which the private interest of an individual cannot have another design independent of that which is annexed to the more general cause of benevolence. The object is so important, as to justify me in
presuming

presuming, that the more that start fairly in this race of humanity, the more truth might be hoped for and expected, and that the prize of reputation will be given to the merit only that truly exacts it.

Another motive that induces me to give a short historical sketch of this disease is, that the publick may be acquainted with the catalogue of prophylacticks that have promised so much and that have fallen so short in their performances; for so prevalent is prejudice, and so natural is the propensity of man to adhere to opinions once rooted in his mind, that whenever an instance occurs of a person being bitten by a mad dog, the confidential receipt-book of the good Lady Bountiful is immediately unfolded, the charm or incantation is wound up, the hotch-potch of herbs are prepared, the dog is sacrificed, and his liver is chopped, and offered up at the altar of superstition. The poor bitten subject is harrassed by the several candidates who throw in their separate claims for infallibility; he is sent to the sea, he undergoes a ducking

ducking, he is brought back and sent again. In short, if absorption of the venom hath taken place, and he really becomes diseased, he is often deserted through fear by his nearest relatives, or which has been done, a period is put to his existence by suffocation. I shrewdly suspect that if the secret ingredients of the compounds be disclosed, which are boasted of in families, they will bear evident marks of legitimacy to one or other of these presumed remedies, which I am about to expose for that very reason.

The history of the hydrophobia affords a great scope for speculative contemplation ; and he that hath enquired into it with the most correct attention, will scarcely be able to draw from it any thing better than an imperfect conclusion.

It should seem as if instances were formerly rare of this disease before the time of Cælius Aurelianus, who flourished in the reigns of Trajan and Hadrian. He was born in a city of some importance, called

Sicca Venerea, in Africa. Cælius Aurelianus has given us a compleat history of the hydrophobia, and has painted the symptoms of it in such true colours, that he has always been looked up to as the original author that has treated on the subject. It appears from him, that if the disease had been before much known, it had not been attended to by medical writers, as he has appropriated a whole chapter to the discussion of "Whether the hydrophobia was a new Disease or not." And here I cannot refrain from expressing my admiration of the wonderful penetration of this valuable ancient; that he should have burst forth at once with so complete and faithful an account of a disease, that even now is only confirmed to be what he said it was, and without the smallest correction whatever, and that these truths should have come forth from him at a time when historick doubts were started by others, "Whether the disease had any existence in reality or not." *

* Vide Cælii Aureliani, 226. Ed. Amstelædam. 1622.

Of the places where the hydrophobia had raged, Cælius Aurelianus tells us, that at Caria and Crete it had very much prevailed. The island of Crete, he says was particularly free from poisonous animals, but that the canine disease had prevailed there very common. He also tells us, that none of the ancients had given a cure for this passion; but he has given a faithful account of what was attempted by them. Artorius advised his patient to be plunged into cold water. Niger and Eudemius bled their patients and gave hellebore. Some gave castor, some oil of roses, some scammony, some gave snow instead of water, judging that the patient may gratify his thirst in that form, when he could not with water; some made use of stratagems to induce the patient to drink, which would make the most serious smile; but Cælius Aurelianus says, that the strictures produce such insurmountable obstacles, that it is beyond a doubt the hydrophobick passion must prove mortal.

Celsus * recommends the plunging the patient into cold water. Hieronymus Mercurialis says, that he was the first of all who wrote on the cure of this passion †.

Galen says that many remedies were referred to, such as the liver of the mad animal boiled, the Coagulum Catuli Lactantis ; but he asserts at the same time, that these remedies, that we may not be deceived, did not effect a cure of that passion, but rather tended to preserve the bitten from extreme fatal consequences ; and with this view, he says, that no one, who took the powder of burnt crabs before the symptoms came on, died of that passion.

Ætius recommends, theriaca, powder of burnt crabs, and lignum vitæ. ‡

* Celsus, lib. 5, cap. 27.

† Celsus flourished Anno Christ. 15.

‡ Ætius Edit. Franfort. Anno 1541. Sermon. 2nd.

Hieronimus Mercurialis tells us, that Oribesius directs a method of ascertaining, whether a suspected dog be mad or not, by pounding of wallnuts, and applying them to the wound inflicted by a dog, and then throwing them for food to cocks and hens, if they eat them, and the dog be mad, they will die instantly*.

We also learn from the same author, an experiment that hath since been confirmed by modern authors, although not told in that candid manner that it ought to have been. It was, that some caused pieces of bread to be rubbed on a suspected wound, and offered them to dogs in common; if the dogs eat the bread, the bite was not poisonous, but if the dogs would not eat the bread, it was a sign that the bite was poisonous. Some extracted blood from the wound, and made such an experiment by mixing it with bran.

* Hieronym. Mercur. Cap. xv. de Rabie.
Oribesius, apud Paulum, lib. 5, cap. 3.

Apuleius recommends the same experiment, substituting barley-meal instead of bran or bread*.

Lommius relates that dogs are terrified at the sight of dogs that are mad, or at hearing them bark.

Default, a French author that made some noise on this subject fifty years ago, relates the same circumstances, but without giving the least credit to the ancient author above recited. The idea was supposed to have been new, and the discovery was supposed to have originated from reports in the history of the Royal Academy of Sciences.

Dr. James's case of Field † would be very strong in point, for by him it appears, that dogs not only shun dogs, but men under the influence of the hydrophobia. But unfortunately (for I think myself unfortunate

* James on the hydrophobia, page 33-34.

† Vide James on the hydrophobia.

when I cannot fall into the opinion of Dr. James in this last instance, who was a man whose medical character I almost adore) I suspect that Field never was truly possessed of the canine disease. The circumstance of Field's neighbour's dog, which was bit by his own dog, being hanged at Charing-crofs before his own door, was too terrible not to excite fear, and too alarming not to fill the mind with imaginary horror; I am persuaded that this was the extent of the injury sustained by Field. That dogs shun dogs that have actually the disease upon them and at its greatest height, may be true. I have thus far digressed in order to give credit where it was due to these ancient authors, whose observations have been copied, but not acknowledged.

vide
p. 62. & 20.

There are many old authors recorded by Portal, and extracted by him from Draudius's Biblia Clasfica * which I have not been able to procure a sight of, most of them

* See the last page,

written in the sixteenth or seventeenth century on this subject; not that I lament much my want of these resources, for wading through these volumes would be attended I fear with unprofitable difficulties, such as searching for a road in trackless sands through a forest of firs. A cure is the object, but where among them is it to be found !

Pliny and Ætius both recommend wallnuts internally*.

Baccus recommends Cantharides.

Van Helmont says that plunging the patient into water is the unicum remedium †.

But the Cineres Cancris usti were the ormskirk of that day, each bearing equal proportion in intrinsic value, and popular credulity.

* Hippocampus Marinus—Silvestris Rosæ Tuberculum.

† Vide Mead on Poisons.

Dr. Martin Lister, in the year 1694, published an Essay on this disease, founded on the authorities of ancient practitioners, being a physician of great erudition, and perfectly classical, the College of Physicians sanctioned his publication, and it certainly contains the perfection of medical information on canine madness, and the mode of treating it up to his time*.

Dr. Lister was a complete master of the medical lore, from whence he drew his resources, and, like many others, regarded so highly the observations of his predecessors, as to be more implicit in his confidence on them, than in making out any new method of his own. The only novelty to be found in this essay is his cases. That of James Cotton, as far as I know, is the first complete history of an hydrophobic patient upon record. In point of facts, it is described with much minuteness, but interspersed with the superstitions of anti-

* Vide Martini Lister sex Exercitationes.

quity, such as the barking of the patient, his lying in bed in the posture of a dog, &c. There is no novelty in his method of treatment, a copy of a copy, the old ground of Hellebore over again, and the death of the patient concludes the case. He has added seven more cases, but the first and the seventh appear to be the two only true hydrophobick cases. The rest are imperfect conceptions formed out of the warmth of a prejudiced imagination. But when I say, that there is not much to praise in Lister, I ought to say, that there is not much to blame, he has charmed them into no false persuasion of a Prophylactick, he has not deluded his cotemporaries, he has rather handed over to them the ignorance of his predecessors, and subscribed his own name under their authority. He has passively submitted to the trammels of their theory, without being energetick in the least active experiment of his own.

Dr. Mead, well known to the medical world, has written an Essay on the Bite of
a mad

a mad dog. He has introduced it in his usual manner, with great display of reading, and hypothetical conjecture. This, like a great many more of Dr. Mead's Effays, is of no other value, than to shew how well he was acquainted with the writings of the ancients. I hope it will not be deemed ungenerous in me to affirm, that, if the instructions of Dr. Mead, for the treatment of this disease, were from the time of the bite strictly followed, not one individual, when thus bitten, would ever recover, provided the infection did take place. The most essential object, that of destroying the power of the action of the virus, by encouraging topical applications for that purpose, as universally advised from the days of Cælius Aurelianus, by cupping, scarification, and many other modes, although not entirely perfect, yet all tending to use, Dr. Mead has taken upon himself to scout. He has added one more imaginary Prophylactick to the former stock. This he got from a gentleman of the name of Dampier, in whose family it

had been kept a secret for many years. It would have been well, if it had remained there. It was first published in the Philosophical Transactions, in the year 1670, and consists of the lichen cinerius terrestris, in English, the ash coloured ground liverwort, and black pepper.

This fallible remedy kept its ground for some time, I believe during the life-time of Mead, and no wonder, as the sanction of his authority would have made it profane to have doubted the efficacy of it. But I should have suffered this specifick to remain undisturbed, was it not necessary for me to demonstrate to the publick, that where blind conjecture is the only foundation for positive assertion, mankind in general, without any respect to persons, are so much upon a level, that the great name is as little to be credited as the most obscure one. Mead has done much more harm than a man of less reputation could have done, for the credit of this silly secret was raised, in proportion to that of his eminent character,

ter, as the object that is placed in the highest point of elevation, is seen at the greatest distance. But Mead was a man of learning and of credulity. The power of this medicine is not only shaken, but now destroyed, and lies entombed in the old London Dispensary.

Boerhaave confesses, that “the cure of
 “this Disease, if we except a few instances,
 “has been hitherto very doubtful and un-
 “certain, both in the Prophylactick and
 “and Therapeutick part; the principal cause
 “of which is a vain boasting of many spe-
 “cifics, and a neglect of that method of
 “cure, drawn from the History of the
 “Disease itself.”*. He advises, first, the application of large cupping glasses to the part, or the actual cautery. Second, that clothes touched with the poison be avoided. Third, that the patient is to be plunged in a terrifying manner into the sea. Fourth, to be sweated. Fifth, to foment his feet

* Aph. 1141,

and hands in warm water. Sixth, to drink cold water, and attend to his general constitution. This is the summary of Boerhaave's prescriptions.

Boerhaave also tells us, that the Prognosis is drawn from the fatal events, that have universally followed the bite of a mad dog; since the most eminent Physicians, in all ages, have lamented that there has been found no certain preservation against the canine poison, nor one single instance, sufficiently attested, of the cure of an hydrophobia.

In the year 1735, Dr. James laid before the Royal Society his new method of curing canine madness, recommending, in the strongest terms, the use of turpeth mineral, and published a pamphlet, on the same subject, in the year 1741.

In the year 1756, Claude de Choisel, a Jesuit, and Apothecary to the mission of Pondicherry, sent some papers to France,

relating to certain experiments he had made with mercury in the canine madness. These were published at Paris, and translated the same year into English. It is evident, that Choifel might, if he did not, have borrowed this practice from Dr. James; for it is no uncommon means, however illiberal, amongst medical writers in both countries, to be studious in concealing how much they are indebted for information to others, and to be avaricious in retaining that literary property they falsely possessed. Monsieur Default, Fellow of the College of Physicians at Bourdeaux, recommended mercury for curing the bite of a mad dog; Default declares, that he did not receive the least hint from any author, but that he was led to think, however ridiculous the thought, that worms were the cause, and seeing that the famous powder of Palmarius was composed of vermifuges only *, he determined to introduce mercury into the blood, as the fittest medicine to destroy worms, which, he supposed, were dispersed through all the

* See the last Pages.

fluids. This hypothesis, such as it is, De-
fault assures us, led him first to the disco-
very of mercury.

I must here remark to the reader, that
Monfieur Sauvry related, in the history of
the Royal Academy of Sciences, for the
year 1699, “ that mercury, perhaps, given
“ in large quantities, may force open ob-
“ structions in the circulation, which are oc-
“ casioned by the contractions of veins.”
This observation of M. Sauvry was known
to Dr. Mead and Dr. Boerhaave. They
have both remarked that state in which
blood vessels are found in the bodies of those
who died of this madness. But neither of
them has taken the least notice of mercury,
with which M. Sauvry proposes to remove
the obstructions.

Cheyne recommended mercury.

Sauvage published an Essay on Canine
Madness, and recommended mercury.

Cullen recommended mercury also.

Many years ago, a medicine composed of pewter filings*, was printed in the Philosophical Transactions, as given by Sir Theodore Mayerne. This was said to be by him a specifick against canine madness. To this succeeded another medicine, commonly known by the name of the Tonquin Medicine, composed of cinnabar, musk, &c. † and first circulated in this country by Sir George Cobb.

But mercury all the world over, and an English medicine amongst Englishmen, known by the name of the Ormskirk Medicine, sold by Mr. Hill ‡, appear to be, in the opinion of some, the confident Prophylacticks of the present day. Thus have our expectations been raised by successions of remedies, and our hopes deluded from time immemorial to this hour, from the

* See the last Pages.

† See the last Pages.

‡ See the last Pages.

ashes of the craw fish of Galen, the woman's dream of dog rose, as mentioned by Pliny, the hellebore, the chopped liver, the mithridate, the sea bathing, the powder of Dampier, the pewter medicine, the powder of Palmarius, the Tonquin medicine, turpith mineral, and various other preparations of mercury, down to the vapid powder from ~~Lancashire~~ Lancashire, which is, in effect, equal to as much chopped hay, or bread pills.

Opium hath had a liberal trial, but only whilst the patient laboured under the influence of the disease, but to as little effect as all the other remedies, which were exhibited in that stage of it: and notwithstanding what we are told by Lister, Nugent of Bath, Hillary of Barbadoes, and a few more, who proclaim, that cases have recovered, after the symptoms of hydrophobia were actually on the patient, yet it does not appear evident to my understanding, that any one patient ever recovered from that melancholy condition. These authors did not
mean

mean to mislead us; it does not appear but that they implicitly believed what they have related to us; and it is from their ingenuous and innocent confessions that I draw my conclusions. The mind of a person, who has been bitten by a dog, supposed to be mad, being constantly under the impression of so dreadful an attack, is open, and for a long time liable to the tyranny and sport of imaginary assaults. This is not only the case in this particular disease, but in many others, where the dread of them hath operated with all its influence.

Although the reputation of mercury, as a prophylactick, hath been spread over the four quarters of the globe, yet unfortunately for its advocates, and more so for the sufferers daily experience in varieties of cases, contradict the affirmation. I shall not enlarge further upon this point, because I consider such an enquiry as mere waste of time, because I am firmly persuaded, that there is not a medicinal power yet known, that will actually, or ever did prevent the fatal progress of the disease, when once the virus is

gone into the habit ; and the most recent cafes of Dr. Dickfon, Dr. Vaughan, Dr. Fothergill, and in particular that late one, where Dr. Turton, Mr. John Hunter, and Mr. Tufon attended, confirm my opinion upon this question. These facts attested at home, by men of eminence, within the fcope of our own knowledge, must deftroy all declarations to the contrary.

But fingular as it may appear, yet it is a truth that ought not to be omitted, that the prejudice in favour of mercury prevails, in fpite of its failure of fuccefs.

Monfieur Laffone, firft phyfician to the King of France, tells us, that fifteen perfons were bitten by a mad wolf ; that three of them, who trusted to oyfter fhell powders, and other remedies, of no ufe, died in a few days raving mad ; as alfo did another, who did not apply for relief, until two days before fhe died. But that the remaining eleven were, by the States of Macon, near which place the accident happened, put
under

under the care of a physician of Cluny, Monsieur Blaise, who treated these eleven with mercurial inunction, and that out of these eleven, thus treated, three died.

This we are told in commendation of the mercurial system of treatment. Both Messrs. Laffone and Blaise have my most cordial thanks for their candid manner of relating these truths; but the conclusions to be drawn from them, argue, in my opinion, strongly against, instead of for, the salutary effects of mercury. Both Dr. James and Dr. Vaughan agree, that nineteen out of twenty may be bitten, without being infected; then, peradventure, where is the impossibility that the remaining eight, out of fifteen that were bitten, might not be infected at all? A very strong mode of reasoning indeed, and such a one as certainly will be followed from the force of the example and instructions of Messrs. Laffone and Blaise; that as three out of eleven, who were bitten by the same mad animal, died, and who at the same time used mercury, so, there-

therefore, mercury is a specifick in this disease, and should be depended upon! This is making a blaze in favour of mercury with a vengeance!

The topical applications to the wounds inflicted by a mad dog, have been neglected to a fault, since the doctrine of the absorbents has been so universally known, since the works of Haller taught us to reason upon that system, and since the action of poisons, illustrated by Redi, but more especially by that modern and most ingenious and laborious philosopher, the Abbé Fontana, have now engaged the attention of all those who delight in such philanthropick questions of philosophy,

Although Fontana hath not made any of his experiments on the nature and action of this poison in particular, yet he hath instructed us by analogy to reason better, in general, upon this subject, as he hath ascertained the true laws of the action of other poisons, and of that of the viper in
par-

particular. Fontana hath silenced those superstitious writers, whose remedies he hath brought to the test, and scrutinized by the rigid touchstone of unerring experiment. Fontana, as it appears, made six thousand experiments on the effect of the bites of vipers. All these experiments tend to prove, that out of the various powers that have been boasted as antidotes to the poison of a viper, not one of them has the least property in reality to effect it.

The volatile alkali, boasted by Jussieu, is demonstrated to be absolutely useless; for it is clearly seen, that when the venom of the viper is effectually applied, the volatile alkali does not diminish its activity. Fontana united a great variety of substances with this poison, but did not observe, that after all, it lost its active quality. He mixed alkalies, neutral salts, oils of vitriol, the nitrous acid, phosphorick acid, and mineral acids.

The

The result of these experiments teach us not to lose our labour in search of an antidote to the bite of a mad dog; for if, after making six thousand experiments, Fontana is as far off as ever in discovering a specific for the bite of a viper, how improbable is it, that success should attend such an hopeless pursuit for the bite of a mad dog?

But I can put this question much more home to common understanding. Scarcely an individual passes through life, without having had the small pox. That disease cannot be prevented from taking effect, if the subject puts himself in the way of catching the infection. The whole of the variolous process must be gone through, in one degree or another; for although we find it practicable to correct the dangerous effects of it, yet we know of no power in medicine that will, after the infecting principle be once gone into the habit, infallibly prevent the eruptive fever and the eruptions in course. Then, if where we have the opportunity,
and

and in a milder disease, of trying ten thousand experiments in the small pox, to one in the hydrophobia, and are yet at a loss for a prophylactick in the former, how desperate must be that idea, which may prompt a man on to expect success in the latter!

It is surely then high time that we should change our system, it is high time that we should draw the line betwixt an absurdity and a possibility; for since we find, from a succession of remedies, and all strongly asserted to be infallible by the most learned of every age, for at least two thousand years, that, in the event, these remedies have proved to be empty pretensions, and delusive in their effect, it would be weakness in the extreme to be lulled by such expectations any longer. I do, for these reasons, not hesitate to declare, that there is no other rational method for the prevention of the dreadful consequences of the bite of a mad dog, but by the cutting out of the part that is bitten; and I promise myself an effectual security from future danger, by such

cutting out of the part, provided that the operation be performed within a seasonable time.

Topical applications to the parts bitten, have been recommended by almost all the great authors who have written upon this subject; but these have only been considered by them as parts of a general method of treatment. These were not so applied as if they were in earnest, as if any dependance were placed in the general good that could be performed by them; these were in the various shapes, in which they were applied, prescribed as a secondary measure; as something done, without a thorough confidence in it, and which, considered abstractedly from other means, was fraught with no high expectations whatever. As they did not depend solely upon this method, as they always had in their view some medicinal prophylactick, as they always joined to it some prophylactick, so have they never followed up this practice to that extent which I exact, and so have they failed of success.

The enlargement of the bitten part, the scarification of the part, the application of cupping glasses to the part, the sucking of the wound, the bleeding it by leeches, the actual cautery, the turning the wound into an issue, the filling it up with gunpowder and setting it on fire, and the application of various causticks, are all fallible. These may succeed, but they are not secure. These have been put in practice, when notwithstanding the disease hath come on. I shall proceed to point out a recent instance of the application of caustick, which failed of the intention; and my reason for introducing this case here, is obvious upon two grounds. The first is to shew, that nothing less than a complete removal of the bitten part from the living subject, will answer the purpose intended thereby. And the second is to shew, that whatever be done short of that complete removal, ought to be considered as a criminal imperfection.

If a case under the immediate care of a man of such reputed eminence, as Mr. John

Hunter, if a case, where the earliest advantage was taken of the injury inflicted, if a case, supposed to be treated agreeable to the most exalted skill of modern practice, if such a case failed, which it most assuredly did, it must have been owing to the inadequacy of the means to the end. And the failure of such a case, under such a combination of happy circumstances of great skill and immediate resource to it, proves a strong necessity of the positive adoption of a method, yet more certain, and not less practicable.

Considering the terms upon which Mr. John Hunter and I stand, it behoves me to be more fully explicit, that he, as well I, should not be misunderstood; and that the arguments, which I have yet to produce upon this very fatal case, should not be subjected to any misconstruction. I shall therefore proceed to give my readers the necessary part of the case, and the letter which Mr. John Hunter wrote to Dr. Hamilton, a physician in Suffolk, after the death

death of the patient, and that letter will amply serve to explain all that I want to have explained.

On December the 6th, 1784, Master R. was on a visit in Jermyn-street, where a stray dog came into the room. A plate of meat was ordered for the dog, which he eat. The young gentleman took notice of the dog, and stooping down to examine it, the animal turned from his meat, and bit him on the right side of the under lip. He was immediately sent in a coach, which was then ready at the door, to Mr. John Hunter, in Leicester-fields, being at the distance of about a quarter of a mile*. The consequence of this bite was, that he died the 13th of Jannary, 1785, at his father's seat, in Suffolk. The following letter was sent to Dr. Hamilton, after the death of Master R. by Mr. John Hunter. Dr. Hamilton did not attend Master R. after his removal into the country, but as a motive for this corres-

* Vide Mr. Tufon's account in Hamilton on the hydrophobia.

pondence,

pondence, he was then collecting information upon this subject, for publication.

“ SIR,

“ I received the favour of yours. I am
 “ always extremely happy when I can give
 “ any useful information ; but all the infor-
 “ mation I can give you relative to the Hy-
 “ drophobia, is rather negative good, than
 “ positive. All the means recommended
 “ were used in Master R.’s case. I saw him
 “ only a few hours after the bite. The lip
 “ was torn a good deal. The teeth had
 “ gone through and through, and had torn
 “ out a piece. I immediately applied the
 “ caustic to every surface that I conceived
 “ had been made by the dog’s teeth ; and
 “ when those sloughs came away, I went
 “ over the same field a second time ; but,
 “ from the termination of the whole, I am
 “ inclinable to believe that I did not touch
 “ every part where the teeth had been. He
 “ took the Ormskirk medicine by the direc-
 “ tion of Mr. Berry who sells it, therefore
 “ we must suppose it was properly given.


“ He also took the Tonquin medicine, viz.
 “ musk, cinnabar, &c. as also rubbed in mer-
 “ curial ointment till his mouth was sore.
 “ My whole dependance was on the caustic,
 “ but did not object to others being given.
 “ I wish I could say more on the subject in
 “ general. We seem to be as much at a
 “ loss how to treat it, as they were a thou-
 “ sand years ago. I have not yet heard the
 “ particulars of Master R.’s attack and symp-
 “ toms. I want very much to learn them.
 “ To ascertain a mode of cure will be very
 “ difficult. For a few cases not having the
 “ symptoms, under any course, prove but
 “ little. I know where there were twenty-
 “ one people bit by one dog, ; nothing was
 “ done for any of them, and only one was
 “ taken ill. If they had all taken medicines,
 “ then it would have been said, that they
 “ only lost one out of twenty-one.

“ I am, dear Sir,

“ Your most obedient servant,

“ JOHN HUNTER.”

A French woman was bitten at the same time by
 the same dog, and she died also.

Here 

Here then is an indisputable case terminating fatally, where every favorable advantage might have been taken. A small animal inflicted the wound. The situation of the wound favourable for extirpation, as the parts divided might have been brought together, as in the operation for the hare lip. The early application of the patient for assistance. The vicinity of the surgeon to the place of the accident. The small space of time between the infusion of the poison and the application of the caustick. All these combine so many seeming fortunate concurring circumstances, as are rarely to be met with.

Mr. Hunter says, " I immediately applied
 " the caustic to every surface that I had
 " conceived had been made by the dog's
 " teeth, and when these sloughs came away,
 " I went over the same field a second time ;
 " but from the termination of the whole, I am
 " inclinable to believe, that I did not touch
 " every part where the teeth had been."

When it is considered, that the sharp-pointed teeth of a small animal made the wounds, and that the poison introduced into them would actually pass to the extremest points of the wounds ; and when it is further considered, that such wounds partially close immediately after that they are made, or are filled up in a great measure with blood flowing from divided vessels, a man of common reflection would be astonished, but scarcely ever convinced, how that caustick could ever pass to the bottom of these little wounds, so that its action should directly and effectually take place.

But admitting that caustick had been as fitting to the purpose of prevention, as the cutting out of the part, in order for these two powers to operate comparatively equal, the caustick should be continually applied, until as much of the parts were destroyed by its action, and in the same given time, as ought to be taken away by excision. If that had been done, which was not done, and if that had been effectually done, then,

in this instance, the distinction betwixt the destruction of the bitten parts by caustick, and the excision of the parts by the knife, would have been, that the former method would have left an unsightly ghastly scar ever after, and the latter would have finished in a seam not uncomely, by bringing the parts into union, and keeping them there until they adhered together. Mr. Hunter does not presume to deny, but that had the caustick been applied effectually, it would have answered the intended end; for he is “inclinable to believe, that he did not touch every part where the teeth had been.” The time was not too long, the opportunity had not passed by, the wound itself was not untractable, but the caustick was not effectually applied. When the life of an individual hung upon so nice a point as that of the bitten part being wholly extirpated or not; and when that perfect power of extirpation was as easily practicable, as that imperfect application of caustick, which failed, a modest man, a man of feeling, or a good surgeon, would have blushed at such an

an apology, as that he was “ inclinable to believe, that he did not touch every part where the teeth had been.”

Having stated this fairly, I shall leave it for the reader to go on with the comment.

If he had ever deigned to read, he would have found, that by Fontana’s experiments, excision of parts, by the viper, never failed of preserving the animal from the deleterious effects of the poison, when performed in time, before that absorption had taken place; and he would have also found, that the caustick did sometimes fail, and that nothing else could be confidently depended upon, but the timely excision of the whole of the bitten parts.

I shall proceed to lay before my readers, some extracts from this very ingenious author. I have chosen the English translation of Mr. Skinner, a surgeon in the Royal

Navy, who a twelve month since translated it at my request.

*‘ Bites of the Viper treated with the Lunar
‘ Caustick.*

‘ The latter part of my experiments is
‘ the more important, in having for its ob-
‘ ject the securing us against the bite of the
‘ viper. My experiments are too few in
‘ number, and too little varied, either to al-
‘ low the drawing from them all the prac-
‘ tical utility that may be hoped, or to ren-
‘ der the method I have proposed, perfect.
‘ Owing to the season, I have experienced a
‘ scarcity of vipers; and the circumstances
‘ in which I have found myself, and the
‘ obligations I have had to fulfill, have pre-
‘ vented my applying myself more atten-
‘ tively, and in the way I should have wish-
‘ ed, to this subject. I shall, for the pre-
‘ sent, publish the result of such experi-
‘ ments as I have been able to make, intend-
‘ ing to return at a more convenient oppor-
‘ tunity, to an enquiry that has the good
‘ of

‘ of my fellow creatures for its object. In
‘ the mean time, I hope that philosophers
‘ and naturalists will pay every attention to
‘ this branch of medicine, and will spare no
‘ pains to render it more certain and use-
‘ ful.

‘ I had a middle sized rabbit bit five times
‘ successively in the leg, by a large viper, and,
‘ after making scarifications, applied the
‘ caustick, and washed and bound the
‘ wounds. The rabbit died at the end of
‘ twelve hours.

‘ I had another rabbit bit several times in
‘ the leg by a viper. It died in the space
‘ of an hour, although it was treated like
‘ the preceding one,

‘ I had two guineapigs bit in the legs by
‘ a viper, each one three times, and after
‘ making the scarifications, I applied the
‘ caustick. Both of them died in a few mi-
‘ nutes,

‘ I re-

‘ I repeated this experiment with the
 ‘ same circumstances, on a large guineapig,
 ‘ which died in the space of twenty-four
 ‘ hours.

‘ These five unexpected deaths convinced
 ‘ me how easy it is to be deceived, even in
 ‘ matters of observation and experiment, and
 ‘ how little trust is to be reposed in analogy.
 ‘ The minutest circumstance suffices to ren-
 ‘ der what in itself would be very useful,
 ‘ both useless and hurtful. *Every one may*
 ‘ *perceive, that in the present case the whole*
 ‘ *difficulty lies in making the caustick pene-*
 ‘ *trate into all the parts to which the venom*
 ‘ *has found its way.* But how can this dif-
 ‘ ficulty ever be surmounted? The holes
 ‘ made by the teeth of a viper are very
 ‘ small, and often invisible. They run in
 ‘ different directions within the skin, and
 ‘ have different depths, according to a thou-
 ‘ sand varied circumstances. The swelling
 ‘ or inflammation that succeeds, augments
 ‘ the difficulty still more, so that the scari-
 ‘ fications are made almost at hazard.

‘ I must

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‘ fible, but that the bite of the viper may
 ‘ kill even instantaneously, provided it
 ‘ should ever happen (which is not abso-
 ‘ lutely impossible) that the teeth should
 ‘ pierce a large venous vessel in such a way,
 ‘ that a quantity of the venom would be in-
 ‘ stantly carried to the heart. In this case,
 ‘ which differs little or not at all from the
 ‘ artificial injection of the venom, the disease
 ‘ may be incurable, and obviate all remedy.

‘ The lunar caustick, I repeat it, renders
 ‘ the venom of the viper innocent, and is
 ‘ its true specific remedy; but much re-
 ‘ mains to be done, to apply it with the
 ‘ greatest advantage in the bite of this ani-
 ‘ mal. It would perhaps be useful to swal-
 ‘ low it, diluted with water, even in pretty
 ‘ strong doses. If the venom of the viper
 ‘ derange the blood, and be fatal when it is
 ‘ introduced into the torrent of the circula-
 ‘ tion of humours, the lunar caustick, taken
 ‘ internally in a liquid form, may weaken
 ‘ its noxious qualities, and correct it in the
 ‘ vessels themselves, to such a degree as to
 ‘ destroy,

‘ destroy, or diminish, the internal disease
 ‘ that this venom produces.

‘ After my having discovered that the
 ‘ lunar caustick renders the venom of the
 ‘ viper innocent, it is natural to conceive
 ‘ that I ought to make some trials on the
 ‘ *lapis infernalis*; I have indeed made several.

‘ I found that a paste formed of this stone,
 ‘ and of the venom of the viper, might be
 ‘ applied with impunity to the wounded
 ‘ muscles of birds; on choosing ten of them
 ‘ for these experiments, not one died. But
 ‘ of three which I envenomed with the
 ‘ teeth, and dressed with the *lapis infernalis*,
 ‘ scraped to a powder, two died, one at the
 ‘ moment of application, the other at the
 ‘ end of two hours. I had four pigeons
 ‘ bit in the legs by vipers, and treated them
 ‘ with the same caustick. One died in my
 ‘ hands immediately after I had applied it,
 ‘ another in the space of an hour, and the
 ‘ two others recovered.

' Notwithstanding that the season was be-
 ' coming unfavourable, and that I had no
 ' longer a hope of finding any vipers, I
 ' met with thirty-four of them by accident,
 ' in an excellent state, and very vigorous.
 ' The first purpose to which I applied them
 ' was that of verifying my new remedy, and
 ' of seeing, at the same time, whether a so-
 ' lution in water of the lunar caustick, given
 ' internally, would be at all efficacious to
 ' animals bitten by the viper.

' I destined four very small guineapigs
 ' for this experiment, and made them drink
 ' a teaspoonful of the above solution: it was
 ' rather weak, but still disagreeable to the
 ' taste. I wounded the femoral muscles of
 ' three of them with venomous teeth, made
 ' immediate scarifications, and applied the
 ' lunar caustick as usual; neither of them
 ' died.

' I made another small guineapig swallow
 ' two tea spoonfuls of the above solution,
 ' and it died in my hands. I conclude from
 ' this

‘ this that the quantity I employed was too
 ‘ great. I afterwards gave a single teaspoon-
 ‘ ful, as in the first experiment, to other
 ‘ four small guineapigs, and had them im-
 ‘ mediately bit by as many vipers, making
 ‘ scarifications instantly after. They all four
 ‘ died. One when scarce bitten, another
 ‘ in an hour, a third in three hours, and the
 ‘ last in five. The result of this experiment
 ‘ shows, that the bite of the viper is far
 ‘ more dangerous, than wounds that may
 ‘ be made artificially with its teeth, although
 ‘ filled with venom. One reason perhaps
 ‘ is, the difficulty of conveying the remedy
 ‘ nicely to all the parts where the teeth of
 ‘ the viper penetrate when it bites at its
 ‘ will. I likewise imagined at the time, that
 ‘ the smallness of the animals I made choice
 ‘ of might partly have caused this, and de-
 ‘ termined, in consequence, to make trials
 ‘ on larger and stronger ones, better able to
 ‘ resist the effects of the poison; parti-
 ‘ cularly the internal malady, which is
 ‘ communicated much quicker in small ani-
 ‘ mals. I had six fowls bit in the thigh by

‘ as many vipers. Five of them swallowed
 ‘ three teaspoonfuls each of the solution of
 ‘ the caustick, the other did not swallow
 ‘ any. I applied the lunar caustick in the
 ‘ same way to each of their wounds; the last
 ‘ died, the other five all recovered.

‘ I had six rabbits of a middling size bit
 ‘ in the thigh by as many vipers. I imme-
 ‘ mediately applied the lunar caustick to
 ‘ their wounds, and made them all drink the
 ‘ solution of it. Four of them recovered;
 ‘ the other two died, one in three hours,
 ‘ the other in eight.

‘ I repeated this experiment on six other
 ‘ rabbits, somewhat larger than the above,
 ‘ and neither of them died. On having
 ‘ four others bit, and treated exactly in the
 ‘ same way, they all likewise recovered.

‘ The number of these experiments is still
 ‘ too circumscribed to render us certain that
 ‘ the lunar caustick is a never failing reme-
 ‘ dy against the bite of the viper; and this

‘ is owing to the difficulty of conveying it to
 ‘ all the parts into which the venom has in-
 ‘ finuated itself: three or four hundred ex-
 ‘ periments would scarcely suffice to fully
 ‘ clear up this important matter; I how-
 ‘ ever have no doubt of the efficacy of this
 ‘ remedy, and can affirm, that the lunar
 ‘ caustick is the true specifical remedy against
 ‘ this dreadful poison.’

*‘ On the utility of amputating the Limbs bit by
 ‘ the Viper.*

‘ We have already seen that the action of
 ‘ the viper’s venom is not instantaneous; that
 ‘ it requires a certain time for its effects to
 ‘ be perceived in the bitten parts; and that
 ‘ the external malady does not communicate
 ‘ itself suddenly to the animal. We have
 ‘ also seen, that if the part bit by the viper
 ‘ be suddenly amputated, the animal sur-
 ‘ vives. All these experiments together sup-
 ‘ ply a certain remedy against the bite of
 ‘ the viper, when one can practice it with fa-
 ‘ cility. It is natural to suppose, that by
 ‘ lop-

‘ lopping off the diseased parts, the life of
 ‘ the animal may be saved; but the amputa-
 ‘ tion ought not to be much retarded, be-
 ‘ cause it is at least certain, that the sooner
 ‘ it is performed the surer its effects. In
 ‘ pigeons it begins to be even fatal at the
 ‘ end of fifteen seconds, at which time the
 ‘ internal malady is communicated, which
 ‘ the amputation encreases, and hastens
 ‘ death, instead of diminishing one and re-
 ‘ tarding the other, as I have been satisfied
 ‘ by several experiments.

‘ Before I examined into the advantages
 ‘ of amputations on animals bit by the viper,
 ‘ I wished to see whether the internal ma-
 ‘ lady would be communicated in a sensible
 ‘ way, and so as even to occasion death in
 ‘ other animals, in the same space of time
 ‘ as in pigeons. It was necessary to try it
 ‘ on animals that die with much greater
 ‘ difficulty than these last, but who would
 ‘ die to a certainty, and in a space not too
 ‘ distant from the introduction of the poi-
 ‘ son. I made choice of very small guinea-
 ‘ pigs,

‘ pigs, because I knew, by experience, that
‘ they had all these qualities.

‘ I had a guineapig bit several times at
‘ the extremity of the foot, which at the
‘ end of twenty seconds I cut off betwixt
‘ the tarsus and the tibia. The animal lived,
‘ and seemed to have no other complaint
‘ than that caused by the operation.

‘ I had another guineapig bit repeatedly
‘ at the extremity of the foot, by a viper,
‘ and at the end of forty seconds cut off the
‘ leg as above. He recovered in the same
‘ way with the former.

‘ A third guineapig received several bites
‘ in the foot, from a viper, a minute after
‘ which I cut off its leg. It recovered as
‘ well as the others.

‘ I had another guineapig bit repeatedly
‘ by a viper, in the foot, which, in eighty
‘ seconds, I cut off; this one likewise re-
‘ covered.

‘ I had

‘ I had another guineapig bit repeatedly
 ‘ in the foot by a viper, and two minutes
 ‘ after cut of its leg ; it recovered likewise.

‘ I had another guineapig bit several
 ‘ times by a viper, in the foot, which, at the
 ‘ end of three minutes, I cut off: this one
 ‘ recovered too.

‘ I had another guineapig bit several times
 ‘ by a viper, at the extremity of the foot,
 ‘ and at the end of four minutes cut off its
 ‘ leg: it died three hours after, having a
 ‘ lividness of the muscles of the leg, and
 ‘ the auricles and heart filled with clotted
 ‘ blood.

‘ I had another guineapig bit repeatedly
 ‘ in the foot by a viper, and at the end of
 ‘ four minutes cut off its leg: it recovered.

‘ It must be observed, that the feet am-
 ‘ putated at the end of three or four mi-
 ‘ nutes, have unequivocal signs of local ma-
 ‘ lady ; these signs are even observed before,
 ‘ although

‘ although with more difficulty, are not so
 ‘ certain, and do not exist always.

‘ Neither of the guineapigs bitten in the
 ‘ feet, and mutilated in less than three mi-
 ‘ nutes, died; but of the two mutilated at
 ‘ the end of four minutes, one died, and the
 ‘ other survived. There are even here then,
 ‘ as well as in many other cases we have seen
 ‘ above, circumstances in which the bite of
 ‘ the viper produces greater or lesser effects;
 ‘ but what is more important, and deserves
 ‘ all our attention, is, that the internal ma-
 ‘ lady is not communicated to the animal
 ‘ till very late, in comparison to that in the
 ‘ cases of the pigeons, or more properly,
 ‘ that it does not become mortal till after a
 ‘ long time, and that the cutting off the
 ‘ part bitten may be made with all possible
 ‘ advantage and safety, within the limits of
 ‘ a much greater time.

‘ But let us continue our experiments, the
 ‘ number of which has been too small to
 ‘ supply us with certain conclusions.

‘ I had a guineapig bit several times in
‘ the foot, by a viper, and cut off its leg at
‘ the end of four minutes: it recovered.

‘ I had another one bit repeatedly in the
‘ foot by a viper, and cut off its leg at the
‘ end of five minutes: it recovered.

‘ I had another guineapig bit in this way
‘ in the foot, and at the end of six minutes
‘ cut off its leg; it died ten minutes after.

‘ I had three guineapigs bit in the foot by
‘ a viper, each one several times, and in four
‘ minutes cut from each a leg: they all re-
‘ covered.

‘ I had three others bit in the foot in the
‘ same manner, and in five minutes cut off a
‘ leg from each of them: they all three re-
‘ covered.

‘ I had three others bit in the same way,
‘ and in six minutes performed the opera-
‘ tion: one only recovered.

‘ I had

‘ I had three others bit as above, and in
 ‘ ten minutes cut off a leg from each: they
 ‘ all died.

‘ From all these experiments it appears
 ‘ that this deduction may be made, that
 ‘ every thing is to be expected from the am-
 ‘ putation of the leg, if performed on gui-
 ‘ neapigs before six minutes are elapsed af-
 ‘ ter their being bit by the viper.

‘ It is natural to suppose, that in larger
 ‘ animals the amputation may be made much
 ‘ later still than six minutes, and experience
 ‘ has demonstrated it in very large rabbits;
 ‘ but we may stumble on another inconve-
 ‘ nience which confines this method very
 ‘ much: pigeons are not endangered by
 ‘ the amputation of the leg; small gui-
 ‘ neapigs bear that of the extremity of the
 ‘ foot, but not always that of the leg;
 ‘ larger animals are more apt to die, when
 ‘ a great part of them, such as the leg, is
 ‘ lopped off; such an operation in these cases
 ‘ is not only useless but dangerous.

‘ It does not, however, follow, that am-
 ‘ putation, even in large animals, may not
 ‘ be useful against the bite of the viper; in
 ‘ general it is so when the animal bears it
 ‘ easily, provided it be done at a convenient
 ‘ time. As amputation may be very useful
 ‘ in a great number of cases, I thought it
 ‘ incumbent on me to make experiments,
 ‘ and to vary them several ways, on differ-
 ‘ ent animals.’

The idea of giving this publication oc-
 curred to me three years ago, but I waited
 the event of the two cases I am about to pro-
 duce, and since then, my time hath been
 filled up with writing on another subject,
 only more serious, because it was more
 common. The method of preventive cure,
 by the excision of parts bitten, is so very
 obvious, that it cannot be presumed but
 that rational men, in all countries, must
 have thought alike about it. I do not pre-
 tend to be the first on the list in recom-
 mending this system. I am content, that
 it should be said, I have added my cases to
 others,

others ; that I have confirmed the truths of Fontana, of Monsieur le Roux, of Dr. Hamilton, of Mr. Newson, and many others. All I ask, is, the confidence of the publick to these points, that I firmly believe the experiments of Fontana are just, and that the analogy betwixt the bite of a viper and the bite of a mad dog, is fair, in a general sense ; but that the bite of a viper is much more rapid in its action, and its poison much more feeble in its power ; that the venom of the viper is a continued constitutional secretion, harmless to the viper who secretes it, of a more exalted nature in summer than in winter ; that the venom of the mad dog is in its action very slow, difficult to be communicated ; that it is a poisonous fluid which has undergone a change from a healthful secretion of saliva, and which is produced by a disease, sui generis from a constitutional cause, ab origine, inherent in the dog, and is continued to be propagated by inoculation through the teeth of a mad dog to a dog otherwise found. That the dog, and some other animals, are subject to
 this

this disease in all countries, and that it prevails, although not so common, in extreme cold, as well as in extreme heat. That the venom of each must be absorbed into the habit, before that the deleterious effects from it can be felt; and that from the torpid action of the venom of the mad dog, these deleterious effects might be always judiciously prevented. I think my two cases are in point, to confirm these assertions.

CASE of ELIZABETH PRATT.

ON Wednesday, the 23d of January, 1785, G. G. Esq. and his lady, of Bromley-hill, in Kent, walked into the town of Bromley, accompanied by their Newfoundland dog. To all appearance, the dog was perfectly well, until they came into the town, when he was perceived to snap at every dog that came in his way: and in the town a great number of dogs were assembled about him. On their return back to Bromley-hill, he then snapped at the pigs, for which Mr. G. beat him, but fortunately he never

never turned to bite. On enquiry of the servants, it was found that the dog had been snapping at every thing in the farm yard that morning. They then began to suspect that the dog was mad, and ordered him to be chained up in his kennel, which was his usual place of confinement. It was made of open slips of wood. When this was done, he made not the least resistance. The servants were all at the time cautioned to keep out of his way: but they were not awakened by this admonition, for Ann Lowe, the dairy maid, on the 24th in the evening, going within the reach of his chain, he flew at her; it was with the greatest difficulty that she could extricate herself from him, and not without having her clothes very much torn. The dog that night began to howl and bark in an uncommon manner. On the 25th, in the forenoon, Elizabeth Pratt, the cook, who usually served the dog with food, went to give him water, when, instead of lapping, he suddenly seized her by the arm, which bled a great deal. She then began to be

3

alarmed,

alarmed, recollecting that the cautions which were before given, of the dog being mad, were founded in truth. Mr. and Mrs. G. being in London, at the time that Elizabeth Pratt was bitten, they were not informed of it until Saturday morning the 26th; and it was not until the evening of the 26th, about six o'clock, that Mr. G. returned from London to his house, accompanied by Dr. John Hunter, of St. Alban's-street, late physician to the army at Jamaica, and myself. The Doctor and I were brought out there for the purpose of doing our best for the cook. The bite was on the external part of the arm, rather nearer the elbow than the wrist. Many punctures of the teeth were apparent, and the parts were inflamed. Late as it was after the accident, we did not hesitate to propose the excision of the part as the unicum remedium. To this the cook, with some hesitation, consented, and about eight o'clock it was done. The skin of the arm, from being exposed to heats and colds, was very thick. The part that was taken out, was

about

about the size of a crown piece; and on account of the part being inflamed, it bled profusely. The muscle beneath appeared livid, as if it had been contused by the gripe. Upon examining the excised piece, I found that the probe passed through only one of the punctures, made by the teeth of the dog. We dressed the wound with lint, moistened with spirit of wine, in which corrosive sublimate had been dissolved, and directed that it should be continually kept moist with the same. This, we judged to be a good after application, as it acted like a caustick, and at the same time there would be no necessity for removing the dressings to apply it. The event of this case was, that the wound healed up in due time, as other wounds do; and the cook has continued well ever since. We staid there all night, and were much disturbed by the yells of the dog; the next morning his master released him from his agony, when almost expiring, by a discharge from a blunderbuss. The wooden lattice of his kennel was gnawed almost through.

CASE of GEORGE LANE.

GEORGE LANE, groom to J. B. Esq. late of Essex-street, in the Strand, was bit by his master's terrier dog, whilst on a journey into the country. The dog had been observed to be not in his usual spirits, when they sat out from town, and had fought with another terrier dog, belonging to the groom, that was tied up in the stable, and which had previously been in familiarity with him. The dog, on the road, discovered encreased symptoms of a disordered state, although it was not suspected even then by them, what was the nature of that disordered state. The groom, conceiving him to be in a fit, got off from his horse, and on coming up to examine him, the dog, although bred up in the closest attachment to the groom, flew at him, and bit him. The dog immediately afterwards dashed through the next hedge, and ran off in a strait line over the country. The groom pursued him for near a mile, but without success, and the dog was never heard of more.

The terrier dog that he bit in the stable, and that was always after kept tied up in the stable, died mad, in a fortnight, from the bite. It was on Friday, the 10th of June, 1785, at nine o'clock at night, that he was bit; and it was on Monday, the 13th of June, at five o'clock in the afternoon, that I extirpated the part. The wound was on the external part of his thumb, near to the knuckle. I here had an opportunity of taking away much of the surrounding parts, as the wound was not large; and I dressed it afterwards with lint, dipt in solution of sublimite, with spirits of wine. Two years since Mr. B. informed me, that the groom was well; and I know nothing to the contrary, but that he continues so to this day.

The distance of time betwixt the bite of the dog and the extirpation of the part, in the first case, was from thirty-two to thirty-five hours. The distance of time betwixt the bite of the dog, and the extirpation of

the part, in the second case, was sixty-eight hours.

This must afford great consolation for many reasons. It gives time to make enquiries concerning the dog, to collect opinions upon the state of the case, to fix regulations about that which is necessary to be done for the safety of the patient, and to bring together some of the ablest surgeons residing in the neighbourhood, to the end that that which is to be done, be done effectually. It should be held as a standing maxim, that the part bitten be taken away, as soon as it possibly can be, after the accident. And although, from some untoward delay, such as cannot be foreseen, either incurred from the carelessness of the patient, or from his not being conscious that he was bitten by a dog that was actually mad, some time may be lost, yet admitting, that it is well understood, that the patient is bitten by a dog that is mad, I am well assured, that in the space of ten hours, an able surgeon might be brought to the assistance of the patient, let the accident hap-
pen

pen wherever it may, in any part of this country,

It is not in my power to form a conclusive opinion, at what period, the patient may be safe, by the part being extirpated, after the bite is inflicted. But I do not think that the idea ought to be abandoned any time before the symptoms of hydrophobia have come on; hope forsaken, is succeeded by despair. In the quotation that I gave from Fontana, the distance of time betwixt the bite being given, and the cutting off the part, for saving the life of the subject, is precisely set down, and vice versa. It is to be presumed, that in proportion to the interval, betwixt the application of any virus to a subject, and its visible effect upon the constitution, will, the time for the taking away the part infected, be safe or otherwise. One may reasonably suppose, that the extirpation of a part bitten by a viper, should be instantaneously performed. That the part inoculated with variolous matter might be deferred for
more

more than twenty hours; and that the part bitten by a mad dog, yet four times longer, as the hydrophobick symptoms, upon a general scale, are forty days before they appear, and those of the small pox ten. Whenever an opportunity offers, some experiments, similar to the following, should be tried. The mad dog should be tied up in a latticed kennel, and permitted to bite other dogs. The bitten parts should be cut out at different periods. The propagation of the disease might be so carried on, as to afford an opportunity of conducting useful experiments ad infinitum. These would mark the security of the method by extirpation, and would ascertain how long a time it would be safe, to delay the operation, after the bite, in that animal. The apparent cruelty of such experiments would prove to be humanity in the end. As when the full extent of the power of the disease, and the remedy over it, be ascertained, we should be enabled to apply such knowledge to the preservation of favorite dogs as well as of ourselves.

These

These experiments would yet be productive of more utility. They would tend to convince obstinate skepticks, and make the system familiar to the most vulgar minds. Whilst those who are endowed with more enlightened understandings, and upon whom the superior gifts of education, and the bounties of fortune, are liberally lavished, should, in return, lend their aid, to remove prejudices deeply rooted in the minds of the uninformed. Their confidence should be guarded against delusive remedies, that it may not be practiced upon by the designing nor the ignorant, to the injustice of all who fall victims to the fatal error, and to the deep affliction of others, who from strong and irresistible affection, poignantly feel the loss from untimely annihilation, in the dearest ties of friends and relations.

From

*From the PHILOSOPHICAL TRANSACTIONS of
the Year 1737-8, No. 445.*

“ The CASE of a lad bitten by a mad dog,
communicated in a letter from Mr. Ed-
ward Nourse, F. R. S. and Chirurgeon to
St. Bartholomew’s Hospital, to Cromwell
Mortimer, M. D. Secr. R. S.

“ Dear Sir,

“ Prefuming that the following Case will
be acceptable to the Society, I beg leave to
communicate it through your hands.

“ I am,

“ Your most obedient servant,

“ EDWARD NOURSE.”

Jan. 18, 1736-7.

“ Stephen Bellafs, aged about sixteen,
some time in June, 1735, was bit by a mad
dog through the nail of his right thumb:
I was called immediately upon the accident,
when I proposed to make a ligature above,
and

and to cauterize the wounded part; but that not being complied with, I desired Mr. Gernum, the apothecary, who was present, to make up the remedy, mentioned by Dampier, in our Transactions, No. 237 and 443. Of this powder he took a drachm, within an hour after he was bit; repeated it the next morning, before he sat out for Gravesend, where he was ten days, and dipt in the salt water every day; during which time he repeated the medicine night and morning, and continued so to do for forty days. This boy was without the least sign of being affected by the poison, till Tuesday last, the 11th of January, 1736-7, when, in the evening, he complained of a numbness in three of his fingers of the hand that was not bit: on Wednesday morning he was sick, had great pain across his stomach, and in all his bones: in the evening, I was sent for to bleed him, the people about him supposing that he had got a cold. When I came, I found him feverish, with a hard full pulse. I asked what complaints he had? The answer was, none, | for | he could not
 L [but that?] swallow;

swallow; whereupon I looked into his mouth, but there was no inflammation; neither did any thing occur to me, that could possibly produce the difficulty of swallowing, he said he had: I offered him some sack-whey in a basin, but he started at the sight of it, neither would he suffer it to come near him. I then offered him a spoonful, which I prevailed upon him to swallow: the moment it was down, he was convulsed, and a remarkable horror appeared in his countenance, which was succeeded by a profuse sweat all over his face and head. He afterwards took another spoonful; the consequence was as before, but in somewhat a higher degree. I was now convinced, that this was the hydrophobia, and that it arose from his having been bit nineteen months ago; for after the most strict enquiry, it does not appear, that he had been bit by any other animal since; and if he had, it is very probable, I should have known it, his master living next door to me, and the boy knowing how much danger we thought him in, when he was bit.

I acquainted his friends with my apprehensions, and desired further advice; upon which Dr. James Munro was sent for, who ordered him to be let blood, a repetition of the above-mentioned medicine, in a bolus, every four hours, and a clyster: he was bled, and the clyster was injected; but he was prevailed upon to take but one of the bolusses. This night was spent with great inquietude, and without any sleep: Thursday morning he was generally convulsed, and had frequent reachings and yawnings alternately; about noon, his mind (which continued sound till then) left him, and he raved and foamed at the mouth 'till five o'clock in the afternoon; at which time nature seemed quite spent, and he lay very quiet till seven, when he died."

"The poison in this boy, you find, was latent near nineteen months; which I know the books mention, but it never fell within my observation before.

“ I do not know, whether it be necessary to tell you, that I cut this boy for the stone last summer, about a year after he had been bit ; I never saw a wound more disposed to heal, and he was well and abroad in five weeks.”

This very remarkable and well authenticated case had not occurred to me, but from a conversation which I lately had with Mr. Pott upon this subject, to all the circumstances of which he was himself an eye witness: for he saw the bitten part at first with Mr. N. he saw the lad cut for the stone, and watched the symptoms of hydrophobia, when they were on him, from the beginning to the end. And such was the impression of this case upon his mind, that he was capable, at this distance of time, of giving me more minute information upon this subject, than had been hitherto recorded. Mr. Pott told me, that the lad was brother to Mr. George Bellas, late a proctor in Doctors
Com-

Commons ; that he was playing with an Italian greyhound, which belonged to his master, Mr. Bates, a vintner, and late an Alderman of London ; that the greyhound was not then suspected to be mad ; that he was bitten in the flightest manner, a little below the nail, on the outer part of the thumb ; and that the greyhound soon after died mad.

This case proves strongly, that the flightest wound, from the bite of a mad dog, is not to be neglected. It might be presumed, that the distance of time, before the symptoms of hydrophobia came on, after the bite of the dog, would keep the mind of a patient in a similar predicament, under a longer anxiety, from the force of example, in the event of this case. But we must not be, from such a motive, afraid to face the truth. This case hath been announced as a singular one. Forty days, as I before observed, is about the general average, from the time of the bite to the time of the coming on of hydrophobick symptoms. A resolution should be fixed, in consequence

quence of this case, and of the arguments already enforced, of depriving the virus from ever acting at any period of time, by an early and effectual extirpation of the whole of the bitten part, if the wound inflicted be ever so slight.

APPENDIX.

A P P E N D I X.

THAT the following account, as given in the London Medical Journal, for the year 1788, Vol. IX. Part 1. might not be said to have escaped my notice, I shall here transcribe it from that Journal.

IX. An Account of an Experiment lately made at Florence, in a case of Hydrophobia. Communicated by Mr. J. Fabbroni, Assistant Director of the Cabinet of Natural History of his Royal Highness the Grand Duke of Tuscany, and Secretary of the Royal Academy of Agriculture at Florence, in a Letter to Sir Joseph Banks, Bart. P. R. S. and by him to Dr. Simmons.

‘ During the last summer we had a great
 ‘ number of mad dogs in the neighbour-
 ‘ hood of this city, and in the city itself.
 ‘ Several persons, who were bit by them,
 ‘ died of hydrophobia; and their bodies
 ‘ were examined after death, but without
 ‘ affording

‘ affording any information relative to the
 ‘ disease. The viscera were uniformly
 ‘ healthy, except in one subject, in which
 ‘ the lungs were found adhering to the
 ‘ pleura; but, in all of them, the brain was
 ‘ observed to be more loaded with blood
 ‘ than usual.

‘ In one case, an experiment, which the
 ‘ physicians here have long had an idea of
 ‘ making, and from which they were not
 ‘ without some hopes, was tried. It was
 ‘ indeed somewhat bold, but in the horrid
 ‘ and hopeless state to which the unhappy
 ‘ patients in such cases are reduced, every
 ‘ thing seems to be allowable; and the per-
 ‘ son on whom the experiment was tried
 ‘ appeared to be so near his end, that it
 ‘ was thought he could not possibly survive
 ‘ more than an hour.

‘ In this case, a viper was applied to each
 ‘ of the patient’s legs, and at the very in-
 ‘ stant of the bite the symptoms seemed to
 ‘ increase in violence; but this was only

‘ momentary, as he immediately became
 ‘ more calm and collected, gave an account
 ‘ of his relations, asked for somewhat to
 ‘ drink, and even drank; but died within
 ‘ half an hour.

‘ This experiment did not seem to be at
 ‘ all conclusive either for or against; but it
 ‘ occasioned so much popular clamour, that
 ‘ I think it will hardly be repeated here, at
 ‘ least on a human subject.’

If this had appeared to me to be a mere innocent medical whim only, or if I were sure that the weak and credulous part of mankind would not fall into such a palpable snare, I should most certainly have treated the above account with silent contempt.

I shall give my opinion of this practical experiment in a few words. That I think it the highest vanity of ideotism, a disgraceful insult upon human understanding, and

a prostitution of the Journal in which it was inserted.

VAN SWIETEN's *Receipt for Palmarius's Powder.*

Take of the leaves of rue, vervain, the lesser sage, plantain, polypody, common wormwood, mint, mugwort, bastard baum, (mellifophyllon) betony, St. John's wort, and the lesser centory, each equal parts.

All these were to be gathered every year, when in full vigour, and dried. Of all these powdered, half a dram, with double the quantity of sugar, was to be taken every morning fasting.

The Pewter Medicine, as it stands in the Philosophical Transactions, from Sir Theodore Mayerne.

Take leaves of rue, picked from the stalks and bruised, six ounces; of London treacle

treacle (or which is better, Venice treacle) garlic peeled and bruised, and fine filings of tin, each four ounces; put them into two quarts of canary, or good white wine; or in case of a nice constitution, into the same quantity of strong and well worked ale, in an earthen vessel well stopped. Then let there be made a digestion, or gentle boiling thereof, in a bath heat, for some hours, shutting in the steam. Then press it and strain it.

The dose is from two to three ounces, or more, to be taken every morning, for nine days.

Dr. Mead's Powder from his own Book on Poisons.

Take of the herb, called in Latin, lichen cinerius terrestris, in English, ash-coloured ground liverwort, cleaned, dried, and powdered, half an ounce; of black pepper powdered, two drams.

Mix these well together, and divide the powder into four doses; one of which must be taken every morning successively, in half a pint of cow's milk, warm.

*Sir George Cobb's Receipt, or the Tonquin
Medicine.*

Take of native and factitious cinnabar, each twenty-four grains; musk sixteen grains. Let them be powdered and mixed together.

This powder was taken all at once in a tea-cup full of arrack, and the dose was repeated thirty days after.

*The Ormskirk Powder, prepared by Mr. Hill,
and analysed by Doctors Haysham and Black.
Vide Medic. Comment. Soc. Edingb. Vol. V.
p. 43.*

Take of chalk half an ounce, of bole three drams, of allum ten grains, of elecampaine one dram, of oil of anniseed six drops. Mix these together for a dose, to be taken every morning, for six times.

CATALOGUE of Authours on the Hydrophobia, in Portal's Tableau Chronol. p. 824, tom. 7. and taken by him from Draudius's Biblia Classica.

Bravius, 1551, Salmanicæ.

Mercurialis Hieronymus, 1580, Bataviæ.

Baccius And. 1586, Romæ.

Varismannus, 1586.

Mancinellus Afcanius, 1587, Venet.

Abbatius, 1589.

Bauhin, 1590, 1591, Montbelliard.

Rofcius, 1606, Bafil.

Caiffon, 1609, Aix.

Codronchius, 1610.

Sprachman, 1613, Lond.

Caiffan, 1616, Paris.

Humel in 8vo. Catalog. du Burette,

Caranta, 1623, Saviliani.

Aromatarus, 1625, Venet.

Bonaventura, 1627.

Stegel, 1640.

Severinus, 1643, Bataviæ,

Gockelius, 1679, Augsburg.

Loffius,

Loffius, 1682.
Ettmuller, 1685.
Albinus, 1687.
Wedel, 1695.
Eyfelius, 1705.
Fetzer, 1733.
Schulze, 1740.
Olivier, 1743.
Boemar, 1745.
Sauvage, 1749.
Nugent, 1754.
Gallarati in Milano.

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A N
E S S A Y

O N T H E

Bite of a Mad Dog, &c.

by J. BERKENHOUT, 1783

I. **I** Know not of any human attempt which bears a better resemblance to the knight of La Mancha's attack of a wind-mill, than that of combating vulgar errors; of reasoning against received opinions. The most powerful and pointed arguments generally fall to the ground, when opposed by the impenetrable shield of common prejudice. Nevertheless, in the present age, when science is hourly making such rapid advances towards the discovery of truth; when knowledge is so much more universally diffused than in
B former

former times, it seems not unreasonable to hope, that mankind may be persuaded to bestow a few moments unbiaſſed attention on a ſubject confeſſedly of the higheſt medical importance.

2. This ſubject hath indeed been amply and learnedly treated by ancient and modern phyſicians, in various countries and languages; in this kingdom particularly, by the celebrated Dr. Mead, and the no leſs famous Dr. James; the latter of whom publiſhed, in the year 1760, an entire volume on Canine Madneſs. Ancient authors were leſs diſſuſe, and were generally ſatiſfied with tranſcribing from each other. Moſt of theſe writers I have conſidered with attention, and acknowledge myſelf much obliged to them for many important facts: I cannot, however, avoid obſerving, that their labours have a maniſeſt tendency to confirm the fatal prejudice which I moſt devoutly wiſh to eradicate; I therefore think myſelf juſtified in adding a ſmall pamphlet to the voluminous tracts already written on the diſeaſe commonly, but improperly, called the *hydrophobia*, or dread of water. I ſay *improperly,*

improperly, because this aversion to water, or to drink of every kind, is only one *symptom* of the disease in question, and that not constantly nor exclusively; for there are many examples on record, sufficiently authenticated, of this *symptom*, this *hydrophobia*, in patients not bitten by a dog, or by any other animal.

3. I am even inclined to assert, that the *hydrophobia* is not generally a *symptom* of the disease produced by the bite of a mad dog. It rarely happens that the patient has any aversion to water or other liquid, until by experience he finds an insuperable difficulty in swallowing. He then dreads the approach of water, having already found that the attempt to swallow any liquid produces a violent and painful convulsion; so that the *symptom* in question is rather a real difficulty of swallowing liquids, than a dread of water. As far as my own experience reaches, I can, with great truth, aver, that I have never yet met with a single patient, who expressed any aversion to the sight, sound, or mention of water, until he had found, by experience, that drinking gave him pain.

4. Some years ago, I was sent for to a young gentleman, who, about six weeks before, had been bit in the arm by one of his father's hounds. A few hours before his death, he stepped into a tub of warm water without fear, sat down, and continued in it half an hour. I shall, in its proper place, relate his case circumstantially: I mention it at present only to prove, that the *hydrophobia* is improperly considered as a diagnostic symptom of this disease.

5. I am equally inclined to dispute the propriety of the denomination *rabies canina*, canine madness; for though persons thus unhappily afflicted are often violently agitated during a short time previous to their death, yet they generally retain their reason to the last moment: this disease, therefore, is improperly considered as a species of madness, if by madness we understand, a distraction, suspension, or perversion of the reasoning faculties.

6. Writers, fond of searching into antiquity for what is not worth finding, have taken great pains to discover the most ancient authors that have written on canine
madness,

madness. Hippocrates, most certainly, has not said a single word on the subject, whatever some of his wise commentators may have imagined. A learned list of ancient authors, who have written on the *hydrophobia*, may be collected from various modern writers; but we search in vain for useful information on this subject among the remains of high antiquity.

7. But if the disease we are about to investigate be neither a species of *rabies*, nor *hydrophobia*, what shall we call it!—It were idle to dispute about a mere name; but when a misnomer conveys a false idea, it is no longer a matter of indifference. The fatal disorder communicated to the human species by the bite of a mad dog is doubtless a spasm of the organs of deglutition and respiration; a species of *angina convulsiva, vel suffocativa*. The generic term *Angina*, is thus defined by the learned Boerhaave, in his 783d aphorism—*Impedita valde, dolens admodum, vel et impedita et dolens simul, deglutitio atque respiratio, quæ contingit a causa morbosa agente in partes binis his functionibus inservientes, supra pulmones et supra stomachum*

positas, Angina vocatur; and in aphorism 818, he says,—Si convulsionum causa quæcunque musculos pharingis laryngesve occupaverit, oritur subita suffocativa angina.

8. As I am here writing particularly to medical readers, it is unnecessary to translate the above quotation. Such readers, after comparing these definitions with the symptoms of the *hydrophobia*, as it is called, will, I believe, acknowledge their surprize, that Boerhaave should not rather have classed it as a species of *angina* than of *mania*. Later nosologists seem equally unfortunate in point of arrangement. In the system of the celebrated Sauvages, we find *Hydrophobia* in the class *Vesaniæ*, and order *Morositates*. His definition of the class is, *error in imaginatione, appetitu, vel juditio*; of the order, *cupiditates aut aversiones depravatæ*. Now, I appeal, not to systematic writers, but to those who have attended patients suffering under this dreadful distemper; and I request them to recollect, whether erroneous imagination, appetite, or judgment, or depraved desires or aversions, were among the symptoms

toms they observed? As to the patient's refusing to drink, it proceeds not from an imaginary aversion to water, but from a real, a painful convulsion in the organs of deglutition, excited by every effort to swallow liquids.

9. Linneus divides the disease in question into two distinct genera, *viz.* *Rabies*, and *Hydrophobia*: the first he defines in these words, *Desiderium mordendi lacerandique innocuos*; the second, thus, *Aversatio potulentorum cum rigore et sardiassi*, adding, *saepius praecedenti maritata*. He places them in the class *Mentales*, and order *Pathetici*, where, from what I have said above, they must appear to have no business.

10. In Vogel's arrangement, under the class of *Febres*, and order *continuae*, we find the *Hydrophobia* thus characterized, *Febris cum aversatione liquidorum, singultu, convulsione, et delirio*. The absurdity of making the hydrophobia a continued fever is so obvious, that it requires no comment.

AN ESSAY ON

11. Dr. Cullen denominates his second class of Diseases, *neuroses*, which he defines—*Sensus et motus læsi, sine pyrexia et sine morbo locali*. *Spasmi* constitute the third order of this class, and of this order, the last genus is *hydrophobia*, thus defined—*Potionis cujuslibet, ut convulsionem pharyngis dolentem cientis, fastidium et horror; plerumque e morfu animalis rabidi*. Of this genus he admits two species, *viz. vulgaris*, and *spontanea*, the first of which is the immediate object of our present consideration.

12. Dr. Cullen, with his usual sagacity, saw the error of former medical writers, who mistook this spasm in the organs of deglutition, for a species of madness.

13. But by what name soever we distinguish this dreadful disease, previous to our enquiry concerning its symptoms in the human species, let us endeavour to ascertain those by which it may be known in the brute, where it originates.

Authors have amused themselves with learned disquisitions concerning the cause
of

of this *rabies* in dogs, wolves, foxes, &c. Some accuse worms within the cranium, or under the tongue. Dr. Cheyne ascribed it to a superabundance of animal salts, and Dr. James was of opinion that extreme heat, want of water, and putrid animal food, are generally the cause of this madness in dogs, which he calls a fever.

*Treat. on
canine
madness,
p. 20*

14. The usual symptoms which indicate approaching madness in a dog, are, first, an evident diminution of his natural keen appetite for food. He eats, indeed, and laps his milk or water, but with obvious indifference. His eyes have lost their usual lustre; he drops his ears and tail, shews no sign of hilarity at the approach of his master, and his whole aspect exhibits a picture of melancholy, perfectly intelligible to those who are accustomed to observe this animal with attention. In a day or two more, he refuses both meat and drink, shuns the society of other dogs, and is equally, after a short reconnoitre, avoided by them. He now quits his habitation, runs forward, evidently without having any thing in pursuit, snaps at every animal

animal that comes in his way, and within forty-eight hours dies convulsed.

15. Such are the symptoms of this distemper in the brute creation; and these symptoms are so constant and unequivocal, that all danger might easily be prevented, by the smallest degree of attention. In the first stage of the disorder, the dog has no propensity to bite, so that he may be seized and tied up without fear.

16. Boerhaave has collected from *Fracastorius* and other writers, a catalogue of symptoms more numerous, and somewhat different from those above enumerated; but as it was not the result of his own observation, his description of this, as of many other diseases, should be read, *cum grano salis*.

Hist. nat.
Lib. 29,
c. 5.

17. Pliny, in his chapter *de medicina animalium*, tells us, that there is a worm under the tongues of dogs, which if extracted when they are whelps prevents their running mad. This doubtless was a vulgar error of the times in which he wrote, and thus the universal prevalence
of

of this absurd opinion down to the present age is accounted for. Dr. James very justly ridicules this idea of a worm under the tongue.—“ I take it (says the “ Doctor) to be a nerve; and this contracting when recently taken away, the “ ideots fancy it stirs, and believe it a “ worm, to which it bears no manner of “ resemblance.”—He is certainly right in believing it not to be a worm; but he is mistaken in supposing it a nerve, for a reason which himself hath adduced, namely, its contraction; nerves are not elastic. He is also wrong in saying, it bears no resemblance to a worm. Morgagni probably was nearer the truth, in calling it a tendinous ligament. Be it what it may, it is certainly of use to the dog and its extirpation answers no salutary purpose.

*On can.
mad. p.
203.*

*De sed. &
caus. morb.
lib. 1. eff.
viii. art.
35.*

18. Let us now trace the progress of this fatal disease in those of the human species who have the misfortune to be bit by a mad dog or cat. The wound, on immediate inspection, discovers no signs of malignity. If it be so superficial as scarcely to have drawn blood it generally heals without the least inflammation, and

in that case there is little or no danger: on the second day it seems a mere scratch, and on the third it is hardly visible. But if, on the second morning, we observe an inflamed circle spreading from the wound, resembling that which surrounds the puncture when inoculation for the small-pox has taken effect, there is reason to believe that part of the poisonous *saliva* of the enraged animal is absorbed, and the consequent symptoms may be rationally expected.

19. Meanwhile the patient takes the Ormskirk, or some other equally infallible medicine, is hurried away to the sea, in which he is two or three times dipped and half drowned; the wound heals, and all his apprehensions vanish. Unhappily, this delusion also vanishes in the space of five or six weeks, about which period he feels a * pain in the part where he was bit, gradually extending over the whole limb. He now recollects his misfortune. The horrible stories he has heard rush upon his mind, and the hourly expectation of
madness,

* This symptom is said to have been first mentioned by Salius.

madness and death fill his whole soul. Under such apprehensions it is no wonder that he should discover symptoms of impatience, anxiety, and even of delirium. But these symptoms proceed from, and are always in proportion to, his apprehensions. His reasoning faculties continue unimpaired; his pulse becomes irregular and quick; but there is no preternatural heat, foul tongue, nor any other febrile symptom. He complains of a fullness and prickling in his throat, and swallows his spittle with difficulty. So far from expressing any aversion to water, he calls for drink; but in the attempt to swallow it he is convulsed, and, after two or three painful efforts, the approach, or even the sight of any liquid produces horror. He continues some time longer to swallow solid food without much pain or difficulty. At last even that is impossible. He now becomes sensible of an irresistible inclination to struggle, and wishes to be held; he breathes quick and with great difficulty, and in a few hours after dies convulsed, as if he were strangled with a cord.

20. Such, and such only, are the proper diagnostic symptoms of this fatal disorder: they are amply sufficient to distinguish it from any other, and are therefore all that are necessary to be generally known; but as a disease so frequently mortal cannot be too well understood, I shall proceed to mention the symptoms above omitted, as I find them enumerated by the principal authors that have written on this subject.

21. *Cælius Aurelianus*, who collected his history of the *hydrophobia* from *Eudemus*, *Soranus*, and other writers with whom we are little acquainted, tells us that the *hydrophobia* is immediately preceded by extreme irritability, unusual motions of the body, disturbed sleep or absolute wakefulness, indigestion, stretchings, yawning, nausea, imaginary notions of bad weather, and no appetite for drink. To these symptoms, according to the same author, succeed, when the *hydrophobia* begins, a desire to drink*, with terror at the sight, sound, or name of water. The patient is afraid even of fomen-

* *Apetentia bibendi*, which Dr. James translates, *a violent and insatiable thirst*. — *Treat. on Can, Madn.* p. 55.

fomentations with oil; his pulse is dense (*densus*) small and irregular: sometimes a small degree of fever, convulsive motions of the stomach, spasms in the precordia, numbness of the joints, and torpor of the intestinal canal; frequent inclination to make water; trembling and catchings of the limbs; voice hoarse, resembling the barking of a dog; spiral posture of the body, like that of a dog lying on the ground; anxiety when any person enters the room, as if apprehensive that he should bring water; redness of the face and eyes; body emaciated, the superior parts pale and sweating; *veretri frequens tensio cum seminis involuntario jactu, &c.*

22. To the symptoms above mentioned Boerhaave adds the following—Lassitude, weight, and indolence in every muscle of the body; disturbed sleep, frequent startings, frightful dreams, convulsions; constant inquietude, depression, sighing, and love of solitude. If the patient be bled, the blood exhibits no morbid appearance. He now complains of a squeezing about his heart. He is terrified not only at the sight of any fluid, but even of
any

Aphor.
1138.

any pellucid or reflecting body. He vomits viscid bilious phlegm or poraceous bile; grows hot and feverish. To a gradual exacerbation of these symptoms are now accumulated a dry projected tongue, open foaming mouth, extreme thirst, an irresistible inclination to spit at, and bite those that are near him; cold sweats, complete *rabies*, and on the fourth day the patient dies.

23. Dr. Mead copies Boerhaave without any material alteration, except in saying that death relieves the patient in two days after the first symptom of *hydrophobia*.

Sauvages, in his *Nosologia*, adds no other symptom to those above related; but from Dr. James we learn the following very curious and material proof of the salutary instinct of dogs, namely, that they fly from persons actually infected by the bite of a mad animal.

24. Such readers as are not acquainted with medical authors, and particularly with the writings of the celebrated Leyden professor, will wonder why he should

should have exhibited so numerous a catalogue of symptoms, if it be true, that so few of them really occur in patients afflicted with this malady. But his wonder will cease, when he is told that Boerhaave, when he began the study of physic, found the science a mere chaos. He immediately conceived the idea of reducing it to method, and, after much reading, condensed and arranged his materials in the form of aphorisms, constituting a new system of physic, which aphorisms he used as the text of his academical lectures. All his symptoms very seldom occur in the same patient: they were collected from a variety of authors, and are to be remembered by physicians, rather as possible *phenomena* than as absolute diagnostics.

25. Having thus attended our unfortunate patient to the final period of his life, let us proceed to examine the morbid appearances in his body upon dissection.

26. *Cappivacci*, an Italian, was, I believe, the first anatomist who published

an account of any dissection of this kind. His observations, together with those of Zwingerus, Brechtfeld, and other writers, were republished in the *Sepulchretum*, and thence collected by Boerhaave, and condensed into a single aphorism, which, for the sake of the English reader, I will translate.

Aph. 1140. — “ The morbid *phenomena* discoverable
 “ in the body by dissection are generally
 “ the organs of deglutition somewhat in-
 “ flamed, bilious gluten in the stomach,
 “ the gall-bladder full of black bile, the
 “ *pericardium* dry, the lungs incredibly
 “ distended with blood, the heart full of
 “ blood almost dry, the arteries full, the
 “ veins empty, blood in the arteries ex-
 “ tremely liquid, and scarce coagulating
 “ in the air, all the muscles, viscera,
 “ brain, and spinal marrow, dryer than
 “ usual.”

Eph. N.C.
dec. 3. a 2.
obs. 104.

27. *Zwingerus*, in a body which he dissected, found the membraneous interstices between the cartilaginous circles of the *aspera arteria* intensely red, and the stomach and intestines sprinkled with red spots.

28. *Brechtfeld*

28. Brechtfeld found the entire tract of the *œsophagus* narrow, and in a state of constriction. *Sepulc. Anat.*

29. M. Sauvry, a French anatomist, found the *gula* and *aspera arteria* in a state of inflammation. *Hist. R. Acad. an. 1699.*

30. *Morgagni* tells us of an hydrophobic patient whose body, though dissected sixteen hours after death, in a cold season, was intolerably putrid. Black bile was found in the gall-bladder; the lungs were also black, and very offensive. The right auricle of the heart was much dilated, the left very narrow. The blood-vessels of the brain were all full; the brain was rather dry. *De Sed. et Caus. Morb. ep. viii. art. 23.*

31. The same author relates another history of a man who died about a month after being bit by a mad dog, and whose body, which was dissected about twenty-four hours after death, in the hottest season of the year, was much less offensive than the former. His neck had a livid appearance; the blood-vessels of the stomach were as full as if they had been injected; *Ib. art. 25.*

injected; the stomach was distended with air, and contained besides a yellow and greenish water; part of the liver was livid, and the gall-bladder was full of brown bile; the diaphragm was a little inflamed; the lungs on the posterior part were tumid with blood, and black; the upper part of the *œsophagus*, *aspera arteria*, *pharynx*, and *larynx* seemed nearly gangrenous; in the head, the vessels of the *meninges* were distended with blood, and the internal substance of the brain was dotted with red points; the internal ventricles contained a reddish *serum*.

Ib. art. 27.

32. In a third dissection the stomach was found to contain a viscid cineritious fluid, and the gall-bladder a small quantity of yellow bile; the iliac veins were violently distended with blood, and their corresponding arteries quite empty; lungs stuffed full with *crassamentum*, and in part almost in a gangrenous state; the heart contained a small quantity of blood resembling melted pitch; the organs of deglutition shewed no other signs of inflammation than a slight redness at the top of the *pharynx*; but the membrane which invests

invests the *epiglottis* was crisp and shrivelled; all the vessels of the *meninges* were immoderably full of black blood; neither the *cerebrum*, *cerebellum*, spinal marrow, *viscera* of the *thorax* and *abdomen*, nor any of the muscles were more dry than they generally are; in the ventricles of the brain were about three ounces of yellowish *serum*.

33. *Morgagni*, after comparing these observations with those of *Mead*, *Plancus*, *Fabbri*, *Brogiani*, &c. concludes, that the bodies after death differ more from each other than when living: “ For (says he) “ whilst alive, they all drink with great “ difficulty, and most of them not without horror; but, upon dissection, we “ find no one phenomenon common to “ every subject. As to that dryness of “ the parts, so generally observed, it is “ by no means universal; nor does it “ seem to deserve much consideration, “ because the violent agitations of the patient, and the consequent evacuations, “ sensible and insensible; the frequent “ exhibition of alexipharmics, and long

lb. art.
32.

C 3

“ abstinence

“ abstinence from liquids, are sufficient
 “ to account for it.”

34. On the authority, therefore, of Morgagni, who was a man of most extensive anatomical reading and experience, we must conclude, that dissections have not hitherto discovered the part, or parts, of the human body particularly affected, or injured, and consequently no curative indication can thence be deduced. He is of opinion, nevertheless, that the seat of the disorder is in the nerves and brain.

Cæli. Aurelii. Lib. iii. c. 14.

Democritus and *Gajus*, two of the most ancient writers on this subject, were of the same opinion; as were also the disciples of *Asclepiades*. Some of the ancients accused the diaphragm, some the stomach and intestines, and some the heart.

Apb. 1142.

35. Boerhaave, from the history and comparison of the *hydrophobia* with other diseases, was induced to believe, that it is first an affection of the nerves; that convulsions of the *viscera* are thence produced; that the blood and humours thence become vitiated; but that the primary seat of the disorder is in the region of the stomach.

stomach. In this last part of his theory, he followed the opinion of *Arthemidorus*, *Artorius*, and the disciples of *Asclepiades*.

*Cæl. Au-
rel. Lib.
iii. c. 14.*

36. Dr. Mead was persuaded, that the seat of the disease is in the nervous fluid, contaminated by the saliva of the dog acting as a ferment, and gradually assimilating the whole to its own degree of morbid acrimony.

*Mechan.
Acc. of
Poisons.
Essay, 3.*

37. Dr. James ridicules these opinions, and roundly declares, that “ he does not believe one syllable of the modern doctrine of nervous juices and nervous distempers.” Previous to the display of his own theory, in order to render it intelligible to readers unacquainted with anatomy, he translates, from Boerhaave’s preface to his *collection of authors on the venereal disease*, a minute description of the cellular membrane; to which he adds two pages more, on the same subject, from Cheselden. The first of these begins thus—“ This membrane is of a vascular contexture,” &c. This is certainly not true. If Dr. James had ever read so common a book as Haller’s *Primæ Lineæ*, he

P. 37.

would not have quoted Boerhaave and Cheselden on this occasion. His theory, however, is briefly this—The poison contained in the saliva of the mad dog is communicated through the wound made by his teeth to the fat contained in the cellular membrane, which fat, by fermentation with the saliva, is assimilated into a poison; now this fat being mixt with the blood, and conveyed to the liver, by the *vena portarum*, the bile is contaminated, and necessarily produces all the symptoms observable in canine madness.

P. 77. 38. To render this theory more intelligible, the Doctor informs the ignorant reader, “ that there is a perpetual intercourse betwixt the blood vessels and the cellular membrane, and consequently between the contents of both, the blood and fat.”—It is somewhat singular, that this poisoned fat should, in its passage to the liver, mix with the blood without injuring that fluid, which throughout the entire progress of the disease is found to differ in nothing from that of a person in health. This obstacle was too obvious to escape the Doctor; but

but he tumbles over it very clumsily: he supposes, notwithstanding appearances, that the blood must be ultimately vitiated by the bile; so that the blood first vitiates the bile, and the bile returns the compliment to the blood.

39. Thus, then, according to Dr. James, the liver is the primary seat and fountain of the hydrophobia, which *viscus*, he tells us, “supplies the rest of the P. 82.
“body with bile in immense quantities.” In what physiological school the Doctor learnt that the rest of the body is supplied with bile in immense quantities is difficult to imagine. I know of no part of the body which is supplied with bile except the *duodenum*, where, mixing with the digested aliment issuing from the stomach, part of it is converted into chyle, and thereby bereft of all its bilious qualities, and the remainder carried through the intestinal canal, and finally ejected: so that no bile, *quasi* bile, is absorbed, and consequently no part of the body except the intestinal canal is supplied with this fluid.

40. But,

40. But, if it be true that the liver is the part of the body chiefly affected in the human species, we may, I think, fairly conclude, that this *viscus* is also the primary seat of the disorder in dogs. Now, it is very certain, that the liver of a mad dog, supposed to be an infallible remedy against canine madness, hath been frequently eaten without any bad effect.

41. There is yet another objection to Dr. James's *hypothesis*, which the anatomical reader will probably think of some weight.—Page 78 of his treatise, he tells us, that “ the poisonous saliva adhering to the tooth of a dog is immediately communicated to the fat residing in one or more of the cells of the cellular membrane;” that “ a scratch is sufficient, if it only raise the cuticle, without drawing a drop of blood;” for (continues the Doctor) this subtile poison, as well as the venereal venom, is capable of entering the cellular membrane when applied to any part not covered by the *cuticula*.

42. Is it possible that Dr. James, the author of a medical dictionary in three folio volumes, should not have known, that there is no external part of the human body which is not covered by the cuticle. That he was really ignorant of this fact is still more evident from the following passage in his 16th page—After relating a case from Van Swieten, who quotes it from *Palmarius*, of several children having caught the *hydrophobia* by kissing their father, who had been bit by a mad dog, he says—“ In this case it is
 “ very possible that some of the frothy
 “ saliva might be conveyed to the lips or
 “ the mouth of the children, which, *not*
 “ being defended by the cuticle, might
 “ communicate the contagion, as it hap-
 “ pens with respect to the venereal poi-
 “ son.”—Now, it is not only certain that the *glans penis*, the lips, and mouth, are covered by the cuticle, but that it is continued through the fauces, *æsofagus* and intestinal canal.

43. But the Doctor assures us that, for the saliva of the dog to poison the fat, “ a
 “ scratch is sufficient, if it only raises the
 “ cuticle.”

“cuticle.” Surely, the Doctor had forgot, that the cellular membrane, with which he took so much pains to make his readers acquainted, and in which the fat resides, adheres to the *internal* surface of the *cutis vera*, which therefore must necessarily be perforated before the saliva can be brought into contact with the fat.

44. If Dr. James had been at all acquainted with the absorbent lymphatic vessels, whose extremities perforate the cuticle in every part of the surface of the body, he would not have deemed those parts only which he supposed destitute of this external shield susceptible of the canine poison. Though the medical world be much indebted to the minute enquiries of Doctors Monro and Hunter for a more perfect intelligence of the lymphatic system, yet the absorption of fluids through the pores of the skin hath been generally known, even prior to the days of Galen, who, as a proof of this fact, says—*Si sitiens balneum ineat, illi sitis sedabitur*. Innumerable experiments have been made by later writers in order to establish this doctrine, particularly by Boyle,

Boyle,

*Gal. de usu
puls. c. 5.*

Boyle, Bellini, and many others. In the Philosophical Transactions we read of men working in quicksilver mines, whose bodies had imbibed so much of that metal, that they changed the colour of brass by rubbing it with their hands, or even by breathing upon it. We know that by handling turpentine the urine acquires a violet smell; that tobacco will vomit, and aloes purge, when externally applied; but the fact most universally known is the constant effect of mercurial unction.

Phil. Tr.
No. II.

45. Hence it is evident that the *cuticula*, or *epidermis*, as it was called by the Greeks, is no defence against the canine, or any other poison, if the application be continued sufficiently to give time for its absorption: it is therefore necessary, when the *saliva* of a mad dog touches any part of the skin, to wipe it off immediately, and wash the spot. The examples, indeed, of persons thus infected without a wound are not numerous, because those on whose hand or face the *saliva* rests naturally wipe it off before it can be absorbed.

46. But,

46. But, in defence of Dr. James it may be urged, that, whether the cuticle be pervious or not, or in whatsoever manner the canine poison pass the *cutis*, it proves nothing against that part of his *hypothesis* which establishes the fat as the immediate receptacle of the poison, and its future vehicle to the liver.

47. In reply to this defence, it will be sufficient to observe, that the bibulous lymphatics, by which fluids on the surface of the body are absorbed, do not discharge their contents into the cellular texture, but, creeping along its membranes, communicate with larger veins which terminate in the *receptaculum chyli*, the thoracic *duct*, or jugular vein; so that the canine poison, or any other fluid, absorbed from the surface of the body, cannot remain in a state of extravasation with the fat in the cellular web, but must necessarily be thrown into the general mass of circulating fluids*.

48. Dr.

* “ I shall avail myself (says Dr. James) of but one
 “ more argument to illustrate the probability of the
 “ canine venom being received and soltered in the mem-
 “ brane which contains the fat, or rather in the fat
 “ itself.”

48. Dr. James's theory, therefore, being contradicted by anatomical demonstration, necessarily falls to the ground. The hypothesis of Boerhaave, Mead, and others, who supposed the seat of the disease to be in the nervous fluid, is equally insupportable, because no such fluid circulates in the nerves, which are not tubes but solid fibres, whose extremities therefore are incapable of absorption.

49. If these theories be false, those who read for information will ask, where lies the truth? If such readers have sufficiently attended to the 47th paragraph they will easily conceive that the poisonous saliva of the dog is absorbed by the capillary lymphatic veins, whose ramifications expand to every part of the surface of the human body; those veins which imbibe the matter communicated by inoculation, the venereal *virus*, water, and infectious *miasmata* from the air.

50. But,

“ itself. And this I draw from the method of cure; for
“ that very medicine which cures the venereal disease,
“ whose residence is in the fat, is also found effectual
“ in preventing and even curing canine madness.”—
Unfortunately for this argument the venereal disease *does not* reside in the fat.

50. But, if this be true, why is it necessary, in order to communicate the small pox by inoculation, that the cuticle should be raised?—I answer: It is not necessary; but that by this operation the communication of the disease is rendered more certain, because the matter being lodged under the cuticle, by retaining its moisture, continues longer in a fit state for absorption.

51. If it should be further asked, why the canine poison, thus introduced, continues circulating in the body five or six weeks before it produces that disease, of a single paroxysm, called the *hydrophobia*?—I answer, that in this it differs from other inoculated diseases only in point of time, In all inoculations there is an intervention of some days between the cause and effect; but why that of canine madness requires a longer time for assimilation and maturity must remain a mystery, until we are better acquainted with nature's *modus operandi*. Probably there are other contagious diseases whose malignant *miasmata* may be equally slow in their progress from admission to efficiency.

52. Some

52. Some attempts have been made to discover the nature of this canine poison by the help of microscopes and chemical experiments; but to no purpose. Dr. Mead supposed it to consist of fiery saline particles. Dr. Heysham believes it to be an acid; but this is mere conjecture. All we know of the matter is, that it is a poison *sui generis*, which, being absorbed by the lymphatic veins, produces certain effects in the human body; no mechanical nor chemical theory, therefore, can assist us in the invention of a remedy against the bite of a mad dog. Analogy may possibly be of some use. Chance, the great inventor of medicines, hath not, I think, been successful in the present case. Let us, however, proceed to the most important, the therapeutic division of our essay.

*Dissert.
Med. de
rab. can.
Edinb.
1771.*

53. Mithridates, king of Pontus, about two thousand years ago, is said to have invented that farrago of more than forty ingredients called by his name. Historians tell us that, believing it to be an universal anti-dote, he took a dose of it every morning. In justice however to his

D

Pontic

Pontic majesty, I must not suppress what *Samonicus* writes on this subject. “When
 “ Pompy (says he) took the baggage of
 “ Mithridates, he found, among his
 “ papers, the prescript for compounding
 “ the famous antidote against all poisons,
 “ invented by that king: he was much
 “ surpris'd to find that it consisted only
 “ of twenty leaves of rue, two walnuts,
 “ two figs, and a little salt.” To whose
 inventive genius we are indebted for the
 forty ingredients which were afterwards
 added I know not, unless to that of
Damocrates, under whose name this cele-
 brated antidote shines conspicuous even
 in the last edition of the London *Phar-*
macopoeia.

54. *Andromachus*, a native of Crete,
 cotemporary with Galen, not satisfied with
 an antidote of forty-five ingredients, com-
 posed one of more than sixty, which he
 called Γαληνην (*serenitas*) from its sedative
 or anodyne effect. This impertinent
 jumble of stuff was afterwards called
 Theriaca, from the Greek word Θηρ, *fera*,
 a wild beast, being an antidote against the
 invenomed bite of mad or poisonous
 animals.

animals. This notable hodge-podge is also to be found even in the last edition of the London Dispensatory; and, what is more extraordinary, there are, I am told, some physicians who continue to use these *theriacas* in their prescriptions: with what intention is best known to themselves.

55. If the inventors of *theriacas* had any ideas at all, they probably thought that, in so great a number of ingredients, it was possible some one of them might hit the mark they aimed at, for the same reason that sportsmen prefer a number of small shot to a single bullet; but I am rather inclined to think them the invention of some arch apothecary's apprentice, who had a mind to try what sort of a medicine he could produce by jumbling together every drug in the shop. Be their origin however what it might, they are certainly the oldest antidotes upon record, and, from the proportion of opium they contain, might possibly alleviate the spasmodic symptoms incidental to the bite of a viper, or of a mad dog.

56. *Dioscorides* wrote a treatise on the *Theriaca*, in the second chapter of which he recommends, as a medicine that might be depended on for the bite of a mad dog, two spoonfuls of the ashes of the river crab, with half the quantity of gentian, to be taken in a large glass of wine. Galen prescribes the same medicine, with the addition of a small quantity of frankincense: the crabs he burnt alive in a copper dish, after the rising of the star *Sirius*, when the sun was in the constellation *Leo*, and on the eighteenth day of the moon. This invaluable secret he learnt from old *Æserion* the emperic, who, being Galen's master, must have lived cotemporary with *Dioscorides*, and might probably be the inventor of this *infallible medicine*, for so it was esteemed by these physicians.

*De simpl.
med. facul.*

57. Dr. Mead is of opinion that this remedy is recommended by the ancients upon rational grounds, because it is a diuretic; "For (says he) "the surest remedies in all ages against this venom have
" been such as provoke a great discharge
" by urine." Reflecting on this circumstance,

stance,

stance, this *Esculapius* of his times, conceived the great idea of recommending to the world his infallible *Pulvis Antylissus*, which, at the doctor's request, was honoured with a place in the London *Pharmacopoeia*.

58. Whence did Dr. Mead conclude that this powder of calcined river crabs, or crawfish (for such he supposes them to have been) would *promote a great discharge of urine*? He certainly thought that this calcination, like the incineration of vegetables, would produce an alkaline salt. If he had possessed the least degree of chemical knowledge, he would have known that the animal itself would burn to a mere earth, totally inert, and that its shell would be converted into quick lime, of which consequently, with a very small proportion of earth, this specific must consist.

59. Dr. James's chemical knowledge appears to have been not much inferior to that of Dr. Mead, whom he thinks totally wrong in translating the *καρκινους ποταμιους* of *Dioscorides*, and Galen, *River Crawfish*. He is clearly of opinion, and

takes some pains to prove, that these authors meant a species of river crab, and not crawfish. Dr. James prudently observes, that we ought to be very accurate in our quotations from ancient authors, “left the medicine recommended be
 “ mistaken for something that may not
 “ possess the same virtues.” This is doubtless a wise observation; but any chemist’s boy would have told him, that the virtues, whatever they may be, of a calcined crawfish, crab, or oyster, are exactly the same; that all shells are calcareous earth, and consequently burn to quick lime, in no respect different from that produced by the calcination of chalk, lime-stone, or marble. But, that Dr. James, as well as Dr. Mead, supposed that this calcination of river crabs produced an alkaline salt is evident from the following passage. Speaking of this powder, he says
 —“ I believe it may have some efficacy in
 “ preventing the canine madness, though
 “ none that can be depended upon. This
 “ opinion is founded on its being an
 “ highly alkaline substance; and all or
 “ most of the pretended specifics for this
 “ distemper are alkaline, and destroyers of
 “ acids;

“ acids; as the celebrated pancake made
 “ of oyster-shells, mentioned by Deseault,
 “ *Armenian Bole, Tin,* and many other.”
 These last words put the doctor’s skill in
 chemistry quite out of doubt.

60. But, as we can hardly suppose that
 Dioscorides and Galen ventured to give
 their patients two spoonfuls of quick lime,
 it is probable that they did not calcine
 these crabs, or crawfish, sufficiently to
 convert the shells into lime, though long
 enough to dissipate the volatile parts of
 the animal. On this supposition this
 specific powder becomes a mere absorbent
 earth, a *pulvis à chelis cancrorum*, possessed
 of no diuretic virtue; yet Galen pro-
 nounces it infallible.

*De simpl.
 med facul.
 L. 3. c. 34.*

61. The next diuretic antidote of the
 ancients, “ recommended (as Dr. Mead
 “ thinks) upon rational grounds,” is the
Spongia Cynorrhodi, sponge of the dog-
 rose, “ Which (says the Doctor) is so
 “ celebrated an antidote, that *P. Boccone*,
 “ who has written a whole discourse upon
 “ its virtues, tells us it is called in Sicily
 “ *Sanatodos*, or All-heal.” We also in
 this country have a common plant dig-

nified with the same name, and equally insignificant in its medical capacity. These *panaceas* are generally good for nothing. But Dr. Mead ranks this gall of the briar among his animal diuretics, because Mr. Ray found it to be the nidus of a fly.—“ Now (says the Doctor) all insects “ abound with a diuretic salt.”—If the lie direct were admissible in polite conversation, I would say, *this is not true*. But I marvel exceedingly that he did not observe that this *Sanatodos* of the Sicilians is called in England a *Dog-rose*, because it produces a medicine for a mad-*dog*: also, that he forgot to inform his readers, that this celebrated antidote originated in the dream of an old woman, as he must have read in Pliny.

62. Dr. Mead, after specifying, from the ancients, other diuretics, which certainly are *not* diuretics, proceeds to the recommendation of his infallible *Pulvis Antilyssus*, which he declared never failed of success, though he had used it a thousand times. “ I have often wished (adds “ the Doctor) that I knew so certain a “ remedy in any other disease.”—Surely such

such testimony, from so great a physician, must be more than sufficient to establish the infallibility of any medicine beyond all suspicion: and yet two greater men, Boerhaave and Van Swieten, are of opinion that it is good for nothing; and Dr. James assures us, that “it has been given, without success, to a great number of people and animals in many parts of the kingdom.”

Aph.

1147.

Pa. 227.

63. This infallible *Pulvis Antilyssus* is prescribed by Dr. Mead in the following words—“Take of the herb called, in Latin, *Lichen cinereus terrestris*, in English, Ash-coloured ground-liverwort, cleaned, dried, and powdered, half an ounce; of black pepper powdered, two drachms. Mix these together, and divide the powder into four doses, one of which must be taken every morning fasting for four mornings successively in a pint of cows milk.”—I have now before me a London Dispensatory with manuscript notes by my worthy friend Dr. Longfield, a physician deservedly distinguished for his sound judgement, and extensive medical

dical knowledge. On the blank leaf opposite to the *Pulvis Antilyffus*, he wrote—
 “ This is Dr. Mead’s famous powder: it
 “ is most certain that it never cured one
 “ person bit by a mad dog.”

64. A moderate share of experience in the medical powers of plants is sufficient to determine *à priori* the virtue of this Lichen, which, together with the rest of its tribe, discovers no other sensible quality than a slight degree of astringency, and therefore can have no other effect than what may be expected from any other medicine, astringent in the same degree; unless we admit the doctrine of specifics, to which Dr. Mead would doubtless have objected, being himself a *sectator* of the mechanical Belini.—*Insipidæ et inodoræ vim medicam vix exercent*, is an aphorism of Linnæus. “ This rule (says Dr. Cullen) “ seems to be without exception; and it “ is on this account, and not on any “ proper experience, that many plants “ are expunged from the *Materia Medica*, “ as having no taste or odour which should “ point out in them any active qualities.”—After such evidence, we may,
 I think,

Pb. botan.
Frag.
meth. nat.
Mat. Med.
 p. 161.

I think, justly proceed to the condemnation of the infallible *Pulvis Antilyffus*.

65. But Dr. Mead, in order to convince the world that he had not adopted this medicine without proper scientific investigation, informs his readers, that he examined the *Lichen cinereus terrestris* by distillation, and that the result of his analysis was, some acid water, some oil, and some coal that contained fixt salt. A bunch of docks, of nettles, of thistles, or of any other common weed, would have yielded the same. This sort of analysis can be of no use in discovering the medical virtues of plants. The receipt to make this celebrated *Pulvis Antilyffus* was first brought to England by Captain Dampier, who called the plant Jew's Ear (*Tremella auricula* of Linnæus) a kind of ash-coloured fungus, which is frequently found on the trunks of old trees. But it seems Sir Hans Sloane was of opinion that the Captain was mistaken; that he certainly meant the ash-coloured Liverwort, which, on the authority of so great a naturalist, was accordingly adopted. Is it not probable from this history, that, in rejecting the original

original Jew's Ear, Dr. Mead seized the ear of the wrong sow?

66. The next infallible medicine I shall examine is that which, about thirty years ago, was brought from Tonquin by Sir George Cobb, when he returned from the East Indies. It consists of native and factitious Cinnabar each twenty-four grains, with sixteen grains of Musk, powdered and mixt well together. This dose is to be taken in a glass of Arrack once only, and repeated after an interval of thirty days. The absurdity of making any distinction between *native* and *factitious* Cinnabar, which are precisely the same thing, is too obvious to need a commentary: it proves, however, the ignorance of the Chinese old woman who probably invented the medicine, and of all those who in prescribing this powder have continued to observe the same ridiculous distinction. But, in the composition of this specific, there is another absurdity of more importance. All the cinnabars, whether *native*, *factitious*, or of cinnabar of *antimony*, are mere powder of post; absolutely inert.

67. " Factitious

67. “ Factitious cinnabar (says Dr. Pa. 155. James) is made of three parts of mercury to one of sulphur; and, as I remember, a pound of good native cinnabar yields near fourteen ounces of fluid mercury; and therefore it seems that the good effects of this medicine ought to be principally, if not entirely, ascribed to mercury.”—Dr. James, having resolved to sport a preparation of mercury as the only specific for canine madness, was quite satisfied with this sort of reasoning: but *we* must come nearer to the point.

68. Native cinnabar is the ore of mercury; that is, mercury mineralized by sulphur, in the proportion of about six, seven, or eight parts of the former to one of the latter.—Sulphur possesses the singular property, in combination with mercury or antimony, of rendering both these violent metallic substances inactive. It is particularly well known of antimony that it is more or less mild in proportion as the *regulus* is combined with more or less sulphur. This chemical fact Dr. James must have known, if he had understood

the process for making his own fever-powder. But mercury, before it can exert its stimulant power, must not only be completely extricated from the sulphur with which it formed cinnabar, but must afterwards be divided by trituration, or dissolved in a mineral acid. Now, the only means of decomposing cinnabar is by fire, in, what is called by chemists, the dry way. In the human body, therefore, it is impossible; but if we could suppose the mercury actually separated from the sulphur, not being dissolved by a mineral acid, or otherwise divided, it would still remain in a state of total inactivity: *a priori*, therefore, cinnabar may be pronounced inert.

69. But, lest the advocates for this Tonquin medicine should deem this sort of philosophical argument inconclusive, let us take the opinions of a few eminent chemists on the subject.—Dr. Cullen, in his Lectures on *Materia Medica*, speaking of mercurial preparations, says—“ Crude
 “ mercury, and the combination in cin-
 “ nabar and *Æthiops mineralis*, to which
 “ may be added *Æthiops antimonialis*, in
 “ so

“ so far as it contains mercury, can only
 “ by accident, or indirectly, prove medi-
 “ cines.”—“ Triturated with sulphur, Pa. 444.
 “ mercury becomes an inert substance.
 “ This I could determine *à priori*, whe-
 “ ther it was in the form of Æthiops
 “ mineral, or native or factitious cinna-
 “ bar.”—Dr. Lewis in his Dispensatory Pa. 331.
 tells us, that “ cinnabar, like Æthiops,
 is inactive.”—Cartheuser, having given a
 large quantity to a dog, says, that it pro-
 duced no sensible effect, but that part of
 it passed through the intestines unaltered,
 and that the remainder was found in the
 stomach and bowels.—Dr. Longfield,
 whom I have before mentioned, wrote the
 following note on the article *cinnabaris*
factitia in the *Pharm. Col. Reg. Med.*
Londinensis—“ It is a shame that the cin-
 “ nabars are not totally exploded: they
 “ have not the least title to the character
 “ of nervous medicines; they are both
 “ inert.”—But it were unfair to conceal
 from the reader, that a famous German
 chemist of the last century was of a dif-
 ferent opinion. He considered cinnabar
 as an efficacious medicine, and ascribed its
 virtue to its beautiful colour, with which

Archeus is so charmed as to neglect the disease which he was employed in exciting; for it seems this *Archeus*, this creature of Van Helmont's distempered brain, is wonderfully delighted with the colour red.

70. In answer to all this reasoning *à priori*, I shall be told, that experience is the only test, and that the instances upon record, of the hydrophobia being cured or prevented by the Tonquin powder are innumerable. In reply to this answer—*First*, there are examples upon record of persons having died of the hydrophobia after taking it, particularly in two cases related in the *London Medical Observations*: *Secondly*, many other medicines, equally infallible and equally extolled, have deservedly sunk into contempt: *Thirdly*, no attestation of facts will convince a rational being that an effect was produced without a sufficient cause: now, a substance which is demonstrably inert can produce no effect in an animal body, and therefore can cure no disease.

Page 195,
and appendix,
p. 3.

71. Cinnabar being thus, I think, fairly dispatched, if there be any antidotal

dotal power in the Tonquin medicine, it must be attributed to the antispasmodic virtue of the musk: Dr. James ascribes it to its alkaline quality—"Musk (he tells us) is an animal substance, and consequently of an alkaline nature; and as alkalies have in all ages been recommended in this case, it seems at least to be not prejudicial."—This is *damning musk with faint praise*. But what did the Doctor mean by ascribing to it an alkaline quality because it is an animal substance? Had he forgot that animal matter wants the assistance of fire to produce alkali? If every species of animal matter be an alkaline medicine, the parings of his own nails would have done as well. Musk, however, is doubtless a powerful antispasmodic, and for that reason may be of service in the *hydrophobia*.

72. This Tonquin powder is ordered to be taken in a glass of Arrack, doubtless with no other intention than to cover the taste of the musk. This vehicle, however, suggests an idea, which, though I may think it extravagant, I will communicate. Suppose, when the symptoms of

the fatal disease in question first appear, previous to the difficulty of swallowing liquids, the patient were to drink to intoxication of any strong liquor he may chuse. Who, without trying it, will pretend to circumscribe the antispasmodic effect of this remedy? It is certainly not contra-indicated by any febrile or maniacal symptoms. In a forlorn hope no attempt can be too extravagant. It will at least answer one good purpose: I mean that of relieving the patient from several hours of the most horrid anxiety that can possibly be conceived.

73. I now beg leave to call the reader's attention to the mercurial preparation so strenuously recommended by Dr. James in his *Treatise on Canine Madness*. It is called *Turpith mineral*; it is a precipitate of mercury from its solution in the Vitriolic acid, by which it was not only dissolved but calcined. Whether it be a pure calx of mercury, without any adhesion of vitriolic salt, is a matter of dispute among chemists of the first reputation. Monsieur Baumè declares positively, *que, ce précipité est absolument privé de toute acide, lorsqu'il a été*

a été lavé à plusieurs reprises dans de l'eau bouillante—Nevertheless, from the effect of the medicine, I presume he is mistaken. It is a very rough mercurial, fit only for dogs, to which animals Dr. James seems to have given it with success. As to its effect on the human species, he produces no more than one single case of a patient bit by a mad dog, and cured under his own immediate care by Turpith mineral. He relates, indeed, three or four other cases in support of his specific, on the authority of persons of his acquaintance; but *hear-say* evidence in this case, as in courts of justice, is inadmissible.—Dr. Raymond, physician at Marseilles gave seven boluses, containing each four grains of Turpith mineral, to a patient bit by a mad dog: the patient died.

*Med. Obs.
append. p.
3.*

74. The Ormskirk medicine, which in many parts of this kingdom, particularly in the North, is deemed infallible, appears, from the report of Dr. Black and Dr. Heysham, to consist of, *Powder of chalk*, half an ounce; *Armenian bole*, three drachms; *Allum*, ten grains; *Powder of elecampane root*, one drachm; *Oil of anise*,

*Med. Com.
Vol. v. p.
50.*

fix drops.—Now, though the chemical enquiries of these gentlemen may not be admitted as proof positive, yet when the result of experiments made by two able chemists, at different times, is precisely the same; when a medicine composed of the supposed ingredients has the same colour, taste, and smell, we have the strongest presumptive evidence that our conjectures are well founded; especially, when there is no discoverable difference between the effect of the real and supposed composition.

75. As to the medical virtues of the ingredients above-mentioned, they are sufficiently known.—Chalk is a mere absorbent earth, without any other power than that of destroying the acid it may meet with in the *primæ viæ*, and, during the effervescence, of producing a little calcareous gas, commonly called fixt air.—Armenian bole, such as is generally sold by the druggists, is nothing more than a lump of pipe-clay, coloured with a little red ochre or rust of iron.*—Allum is an astringent,

* This English or Dutch Armenian bole is, in no respect, inferior to the true Oriental, or to any other bole, for medical purposes.

astringent, and nothing more.—Elecampane-root hath been generally ranked among the Alexipharmics; it is said to assist expectoration, and, in large doses, to act as a diuretic and cathartic: it is, however, in no estimation, and in so small a dose, mixt with the other ingredients, can produce no effect.—As to the six drops of oil of aniseed, I presume their efficacy, in the present case, will hardly be insisted on.

76. Possibly I may be told, that, though these several ingredients, separately taken, may possess no extraordinary medical powers, yet, like other compounds they may, when united, form a medicine of considerable virtue.—I acknowledge that a powerful medicine may be formed by a judicious combination of simple ingredients, prescribed on chemical principles; but I am very certain, that an ignorant jumble of chalk, clay, allum, and elecampane, will form nothing but an heterogeneous mass of dirt, that may do harm, but cannot possibly do good in any disease whatsoever.

77. But, say the advocates for the Ormskirk powder, what signifies reasoning against facts? Are there not a thousand examples of the hydrophobia prevented by taking this medicine? Would the sagacious inhabitants of the northern counties have such faith in a mere *ignis fatuus*? —Far be it from me, to doubt the sagacity of the northern counties: they are by no means singular in mistaking shadows for realities. All quack-medicines, and more than half the medicines used in regular practice, are *ignes fatui*. What are all the vaunted *panaceas*, *theriacas*, antidotes, and specifics, but *ignes fatui*, deceptions, chimeras?

78. The several specifics above considered have all successively had their day of infallibility, and have all been equally supported by experience, the true test of medical virtue: that is, a number of people bitten, or supposed to be bitten, by dogs supposed to be mad, have taken the Ormskirk, or any other infallible powder, and have escaped the hydrophobia. But in the *London Medical Observations*, &c. we have, on the authority

of Dr. Fothergill, an incontestable proof that the Ormskirk medicine is not infallible: Mrs. Bellamy, who was bit by a mad cat, took it, and “conformed to the directions given by the vender in every respect,” yet died of the hydrophobia about four months after, as, I make no doubt, would all the patients that ever took the Ormskirk medicine, if they had been really infected by the canine poison.

79. This censure I do not confine to the Ormskirk, nor yet to any of the medicines above-mentioned: it comprehends every prophylactic remedy taken internally. Can any thing be more absurd than to imagine, that a disease received into the body by inoculation; a poison absorbed by the lymphatic veins, and mixed with the general mass of circulating fluids, can be destroyed by a medicine taken into the stomach? Is there any analogy in the history of physic to authorize such expectations? Will any powder, pill, or bolus, stop the progress of the small-pox by inoculation, or prevent it from taking effect? Was there ever a phy-

fician weak enough to attempt to prevent any other infectious disorder, after the poisonous *liquid* or *miasmata* were actually absorbed?

80. Having thus, I hope not unfairly, considered the pretensions to infallibility of the specifics introduced and recommended by particular men, we are come at last to that sovereign remedy extolled by every writer on canine madness, ancient and modern, and used in all countries, in every age, from the days of Celsus to the present moment—I mean *bathing in cold water*. To this part of our subject I beg the reader's particular attention, because I am very certain that many lives have been lost by a foolish dependence on this broken reed. I have said that all writers on canine madness, ancient and modern, have recommended cold-bathing; but I must except Dr. Falck, the author of *The Seaman's Medical Instructor*, and Dr. Fothergill, who wrote a paper in the *London Medical Observations*, purposely to prove the inefficacy of bathing in the sea.

Vol. v.
p. 290.

81. The physician last mentioned was of opinion, that the practice of bathing
in

in salt-water, as a preservative, originated in a mistake. Celsus directs the patient, actually labouring under the hydrophobia, to be thrown unexpectedly into a fish-pond: if he cannot swim, he is to be suffered to flounce and drink, raising him a little now and then, so as to keep him from drowning; but, if he can swim, he is to be frequently ducked, that in spite of himself he may be satiated with water: “ Thus (says Celsus) his thirst and dread of water will be cured at the same time.”

Cels. lib.
v. c. 27.

82. *Celsus* was mistaken in supposing that he could force the patient to drink by holding him under water, or that, after being half drowned, he would look on water with less horror, or swallow liquids with greater ease. The latter part of this discipline is daily practised, by the old women at the watering places, on the wretched creatures that are sent by old women, male and female, from the inland country. This practice of drowning the patient in order to cure him of an aversion to water, absurd as it is, was probably taken from *Celsus*, who, though a sensible man,

man, possibly without experience or much reflexion, prescribed it on the authority of some Greek writer; but why the sea was substituted for a fish-pond, and how it came to pass that what *Celsus* ordered as a cure for the hydrophobia actually present, should be applied as a prophylactic, a preservative remedy, is difficult to conceive.

83. Who was the inventor of this immersion in salt water I cannot determine. I am inclined to think that it originated in Holland or Flanders, in the days of panaceas, charms, witches, and hobgoblins. That it was a common practice in the Netherlands in the sixteenth century appears from the following passage from Van Helmont; which, as his books are not in every library, and, I believe, were never *done* into English, I shall endeavour to translate literally.—“ There is a fortress
 “ on the sea-coast, about four leagues
 “ from Ghent, called Sluce. There I
 “ saw a ship passing by, and in it an old
 “ man, naked, bound, and weights
 “ fastened to his feet. Under his arms
 “ they had tied a rope, the other end of
 “ which

“ which was fixed to the yard-arm of the
“ vessel. I asked the meaning of this
“ spectacle, and was answered by one of
“ the failors, that the old man had got
“ the *hydrophobia*, having, some time ago,
“ been bit by a mad dog. Why, I
“ asked, is he brought to the sea? Whe-
“ ther they meant to drown him? ‘No, no,
“ (said the failor) he will soon be cured;
“ such is the blessing of God upon the
“ sea, that it will instantly cure this kind
“ of madness.’ At my request they took
“ me on board. We had scarce sailed a
“ mile, when the failors, by pulling out
“ a plug in the bottom of the ship, let in
“ the water, till she sunk almost to the
“ edge of the gunwale. This sea-water
“ they collected for the purpose of making
“ salt. The plug being now re-adapted,
“ two men hauled down the opposite
“ end of the yard, and thus hoisted the
“ old man into the air. They then let
“ him drop into the sea, and he remained
“ under water *ad spatium Miserere*. They
“ repeated this operation twice more,
“ keeping him each time under water *ad*
“ *spatium Salutationis Angelicæ*.”

84. Some profane readers may possibly be inclined to comment ludicrously on this *spatium Salutationis Angelicæ*; but, choosing rather to treat the matter seriously, I requested a friend to read over the *Miserere*, and found by my stop-watch, that he performed it in one minute and thirty-five seconds; and the *Salutatio Angelica* in ten seconds. Van Helmont is not sufficiently explicit in this important part of his narrative. Whether this was only a method of computing time, or whether these psalms were actually repeated during the immersion, does not appear. I am inclined to think they were: if so, this capital omission in our old women on the sea coast sufficiently accounts for their fallibility. But to proceed with Van Helmont's story.

85. “ They then laid him on his back
 “ across a barrel, and covered him with
 “ a watch-coat. I concluded he was
 “ dead; but the sailors ridiculed my ap-
 “ prehensions. Being now released from
 “ his bonds, he discharged all the water
 “ which he had *inspired*, and presently
 “ revived. He was a cooper from Ghent,
 “ and

“ and being cured of his *hydrophobia*,
 “ continued perfectly well.”

86. If the poor cooper remained long in that position, *supino dorso super vas teres*, I marvel that he ever recovered. That the Dutch failors should believe that his lungs were full of water is no great wonder: Van Helmont should have known better. There are, indeed, writers of some reputation, who tell us that they have found water in the lungs and stomach of drowned subjects; but, waving the improbability of the fact, later experiments prove incontestably that drowning animals rarely imbibe any water; certainly no quantity to do them any injury. *Morgagni* drowned guinea-pigs, hedge-hogs, dormice, and other animals, and found on dissection little or no water in the lungs or stomach of any of them. The opinion that drowned persons are full of water, erroneous as it certainly is, prevails so universally among the ignorant, that I am persuaded many have been prevented from recovering by holding them up by the heels, or laying them on the side of a hill, with the head downwards.

Ep. xix.
art. 41.

87. These

87. These Dutch skippers told Van Helmont, that a salt herring applied immediately to the wound was an infallible cure for the bite of a mad dog, and that half drowning in salt water was only necessary when this remedy had been neglected; so that we have neither the authority of Celsus, nor the practice of the Netherlands, to plead in favour of sea-bathing as a preservative. The case of this cooper, if we believe that he was really so mad as to require being fettered, affords a singular example of the hydrophobia actually cured by immersion in salt water: it is indeed so singular, that I can produce but one more on any tolerable authority. The instances in which it has failed, as a prophylactic remedy and cure for the hydrophobia, are innumerable.

88. Morgagni, *Epistle* viii. *Art.* 23. tells us, that an hydrophobic patient was thrown into a cold bath, and held some time under water: he died the night after. —In *Art.* 25, we read of another who died soon after he was taken out of the bath. —*Art.* 26. After mentioning Van Helmont's cooper, and the case of a girl recorded

recorded in the history of the Academy of Sciences at Paris, Morgagni writes thus: “ Immerfion in cold water muft have
 “ fucceeded very differently with others;
 “ fince, befide *Baccius*, and him whom
 “ *Parry* pointed out, not only *Salius* has
 “ written that he, after feveral times
 “ experience, had found no advantage
 “ from this remedy, but alfo *Cælius Aure-*
 “ *lianus* exprefsly difcommended it, as
 “ injurious. But *Palmarius* has admo-
 “ nifhed us, that it was certain, from the
 “ experience of many, that this method
 “ of treatment had been very unfuccefs-
 “ ful.”

Ann.
1699.

89. *Boerhaave's* directions for bathing the patient in the fea, or in a river, are very fingular.—“ Immediately after infection, with great preparation, exciting fear, and after frequent threatenings, at laft throw him into the water.”—He then repeats the orders given by *Celfus* for half-drowning the patient: “ for (he adds) the cure is effected by the
 “ perturbation of the mind (*spiritum turbando*) agitation of the animal fpirits,
 “ and not by the falt water, as we learn
 “ from

Apb.
1143.

“ from the deplorable exit of the man
 “ who, after being bitten by a mad dog,
 “ was ship-wrecked and swam a long
 “ time in the sea, frequently covered by
 “ the waves, yet died of the hydropho-
 “ bia.”—This being the case, threatening
 to *hang* the patient would answer the same
 purpose. Here, I think, sea-bathing seems
 to be fairly given up.

90. *Dr. Mead*, speaking of sea-bathing
 as a preservative, says, “ I have known
 “ many to have died raving mad who had
 “ undergone this treatment.”—“ I will
 Page 235. “ not (*says Dr. James*) pretend to de-
 “ termine how much more effectual bath-
 “ ing in the sea may be than in cold
 “ fresh water. It is certain that many
 “ that have been almost drowned in the
 “ sea have soon after died of the *hydro-*
 “ *phobia*; and I knew a gentleman who
 “ took thirty couple of fox-hounds to the
 “ sea, and had them dipped with all
 “ manner of caution; notwithstanding
 “ which, he lost several hounds every
 “ day he took out the pack.”—In the
 Edinburgh *Medical Essays*, we read of a
 boy, bit by a mad dog, who was ten times
 dipt

dipt in the sea, yet died of the *hydrophobia* some months after.—*Dr. Fothergill*, in his *Additional Remarks on the treatment of persons bit by mad animals*, addressed to the editors of the *Medical Observations, &c.* says: “ I have heard of diverse instances, P. 290.
 “ and I have no doubt but you are as well
 “ satisfied as myself, and perhaps from
 “ your own observation, that this process
 “ (sea-bathing) is by no means a prefer-
 “ vative from the fatal consequences of
 “ the bite of mad animals.”—*Desault*, a physician at Bourdeaux, in his treatise *sur la Rage* gives his opinion on this subject in the following words: “ When I am
 “ applied to by a person bit by a mad
 “ animal, I order him to bathe in the sea,
 “ though I have no dependance on this
 “ remedy, since the many proofs we have
 “ had of its inefficacy in the course of
 “ the present year.”—*Choisel*, a Jesuit residing at Pondicherry, in a pamphlet published at Paris in 1756, in which he relates many examples of canine madness cured by mercurial friction, says: “ Bathing
 “ in the sea has hitherto been considered
 “ as an infallible preservative from this
 “ disorder. My own experience proves
 F “ the

“ the futility of that opinion. Not one
 “ of those who depended solely on this
 “ remedy survived the bite more than
 “ thirty-three days.”

91. I presume the reader is, by this time, satisfied as to the efficacy of bathing. The reason why it continues, in the present age, to be used as a prophylactic remedy for the bite of a mad dog, is the same which may be assigned for a thousand other foolish customs—*our fathers did so before us*; and their reason was, that *their fathers did so before them*: but from what theory the inventor of this remedy deduced his prescription is not easily imagined. All medicines must have originated either in reasoning *à priori*, or from some fortuitous event. The first, I think, is, in this case, out of the question: I conclude, therefore, that some person bit by a dog, supposed to be mad, accidentally fell into a horse-pond. He continued well; *ergo*, the hydrophobia was prevented by a ducking. The reputation of some other medicines in constant use for other diseases is not a whit better supported.

92. *Aurelianus,*

92. *Aurelianus*, in his chapter entitled *Quomodo curandi sunt hydrophobi*, exhibits the various prescriptions of all the authors he had read upon this subject. Most of them deserve no notice. I shall select a few however which, doubtless, the reader will think too important to be neglected:—“ Let the patient’s chamber be tolerably warm and lightsome.—Let the part that was bitten be covered with a piece of clean warm flannel.—If it be necessary to bleed him, let the blood be received in the hand of the assistant, lest the noise of its falling into the basin should affect the patient.—Talk to him about washing and drinking, and, if he hears this patiently, you may then give him something to drink; if not, you may let him suck through the spout of a tea-pot, covering his eyes or darkening the room.—Let his nurses be discrete and not * loquacious.—Let his head be shaved.—Let him be exercised in a hammock or a sedan.—If he refuses to take any liquid in at his mouth, force it into the other end of him; but, take care that you do not

F 2 “ administer

* *Aurelianus* did not mean female nurses.

“ administer too great a quantity, lest it
 “ squirt in your face. This perilous
 “ operation being happily accomplished,
 “ you are then to squeeze his, or her,
 “ belly, so as to force the contents up-
 “ wards, and thereby quench the patient’s
 “ thirst. *Tullius Bassus* (says our author)
 “ besides clysters gave his patients a pinch
 “ or two of snuff; whose friend *Dr. Black*
 “ gave *white hellebore*, of which some
 “ physicians order a cataplasm to the
 “ patient’s backside.”

Demen’s
idea,
 p. 287.

93. “ *Paracelsus* (says *Van Helmont*)
 “ affirmed, that the hydrophobia might
 “ be cured by acrid purgatives. His pro-
 “ mises, however, are not justified by the
 “ event. Our good Catholics, therefore,
 “ despairing of relief from the faculty,
 “ repair to *St. Hubert*, at whose shrine,
 “ by virtue of certain ceremonies, they
 “ are cured; but, it is worthy of remark,
 “ that if these ceremonies are not strictly
 “ observed, the latent *rabies* immediately
 “ breaks out, and they become irrec-
 “ verably hydrophobic. There is a vest-
 “ ment of *St. Hubert’s*, which is pre-
 “ served in a chest, secured by six locks,
 “ the

“ the keys of which are kept by six dif-
“ ferent Vergers. For these fourscore
“ years past they have been continually
“ cutting off pieces from this holy vest-
“ ment; nevertheless it remains, to this
“ day, perfectly entire. Now, it is im-
“ possible there should be any imposture
“ in the case; for they have never been
“ able to discover whether this miraculous
“ robe be of linen, woollen, or of silk,
“ consequently it cannot be annually re-
“ newed. They cut off a piece of the
“ robe, and incarnate a thread between
“ the skin of the patient’s forehead.
“ Hence another miracle; for a person
“ thus cured becomes possessed of a power
“ to postpone the hydrophobia during
“ forty days in any of his acquaintance,
“ who, after being bitten, may not have
“ leisure immediately to visit St. Hubert:
“ on this condition, however, that if they
“ exceed the forty days ever so little,
“ without applying for a prorogation of
“ the term, they go mad irrecoverably.”

94. Those who are conversant with books on this subject, will ask, why I have taken no notice of the celebrated

powder invented by Palmerius?—I have two reasons: *first*, because it *deserves* no notice; *secondly*, because it is never prescribed in this kingdom, and therefore can do no mischief. I have omitted several other *infallible* medicines for the same reason. An idle display of medical erudition on so trite a subject were ridiculous. I sat down solely with a design to convince the less informed part of the community, that their opinions concerning the prevention of canine madness, or *hydrophobia*, are fatally erroneous, inasmuch as that dependence precludes the application of more rational means. I determined to employ a few leisure hours on this subject, because Boerhaave, Mead, and other physicians of high reputation, have authorised such irrational dependence.

95. But this is not the sole mischief of which the erroneous opinions of eminent men are productive. Dr. Mead, fully persuaded of the all-sufficiency of his *Pulvis Antilyssus*, endeavours most irrationally, to divert his readers from an attention to the wound. These are his words—“The ancient physicians, who are
“ followed

“ followed in this by the moderns, advise,
 “ where the place will admit of it, to
 “ enlarge the wound by incision; to ap-
 “ ply a cupping-glass; to burn it with a
 “ hot iron, and to keep a discharge from
 “ the ulcer for many days. I cannot but
 “ say, that I think all this severity use-
 “ less.”—“ It happens in most cases that P. 89.
 “ the wound, being small, is healed up
 “ before the patient seeks for help. For
 “ this reason, and because it is of no great
 “ consequence whether it be cured or
 “ not, in the paper which I printed and
 “ dispersed some years since, entitled, *A*
 “ *certain cure for the bite of a mad dog,*
 “ I took no notice of any outward appli-
 “ cation.”—I will, without hesitation,
 venture to pronounce this the most per-
 nicious doctrine that ever was taught by
 any physician ancient or modern. It af-
 fords one of the most flagrant examples
 in the annals of medicine, of a sensible
 man and a scholar sacrificing his reason,
 his common sense, to a preconceived
 hypothesis. He imagined that the poison
 contained in the saliva of the enraged ani-
 mal contaminated a nervous fluid—which
 has no existence; and that this poison
 F 4 might

might be carried off by a diuretic medicine—which is certainly neither diuretic nor any thing else. He advised cold bathing, because, on mechanical principles, he supposed that the external pressure of the water, by constringing the vascular system, would determine the segregated poison to the kidneys, and so assist the operation of his *Pulvis Antilyssus*.

96. Before I prescribe that which I conceive to be the only rational means of preventing the fatal effect of the bite of a mad dog, it is necessary that I should answer a very natural question.—If (says the reader) the several specifics above condemned are really good for nothing, how comes it that so many persons bit by mad dogs are daily cured by the Ormskirk medicine, bathing in the sea, &c.?—If this were not what is called begging the question, I should be distressed for an answer; but the truth is, that all those who believe themselves cured by these futile preservative remedies were never infected; and consequently no harm would have happened, whether they had used them or not. Fortunately for mankind,
not

not one in fifty of the dogs supposed to be mad are really mad; and of those few that are so, their teeth are often wiped clean by the clothing of the person bit, and consequently no inoculation takes place. It happens also, as in all other infectious diseases, that the body is frequently not disposed to receive the infection. These, and these only, are the causes of all the transitory reputation which the various *infallible* medicines have from time to time acquired.

97. Nevertheless, as the case is always doubtful—as possibly the dog may be actually mad, and the poison really imbibed, nothing can be more imprudent than to depend on the chance of its being otherwise: we are, therefore, to act as if we were certain that the dog was a mad dog. The person bit must immediately apply his mouth to the wound, and continue to suck it during ten minutes or a quarter of an hour, frequently spitting out, and washing his mouth after each time with water, warm or cold, no matter which. If the wound be in a part of his body which he cannot reach with his mouth,

mouth, possibly he may prevail on some rational friend to do him this kind office; especially when I assure him, positively assure him, that it may be done without the least danger. My own son, then about eight years old, in returning from school, was bit by a dog in the thigh. My eldest daughter, being informed of the accident, without the least hesitation immediately sucked the wound. She had heard me say it might be done with safety. The dog was certainly not mad; but I relate the story in justice to her affectionate intrepidity, which, in a young girl, was somewhat extraordinary.

Lib. III.
c. 2.

98. Neither ancient nor modern writers, if I remember right, have advised sucking the wound received by the bite of a mad dog: yet Galen, in his book *de Temperaments*, says, *that the saliva of this animal is not equally dangerous when admitted into the stomach*; therefore, it is probable that, in some part of his voluminous writings, he may have mentioned this experiment. But, in the bite of a venomous serpent, Celsus, and after him Dr. Mead, lays great stress on this preservative

Lib. V.
c. 27.
P. 37.

fervative application. It is very extraordinary, that in one case the Doctor should deem it of so much, and in the other, of so little importance. The first of these authors assures us, that the Pfylli, a people who pretended to an hereditary and exclusive power of curing the bite of serpents by suction, owed their success solely to their resolution; for, says he, *Venenum non gustu, sed in vulnere nocet*; adding, “ whoever, therefore, sucks the
 “ wound after the example of these Pfylli,
 “ will save his friend, and do himself no
 “ injury.”

99. Dr. Mead was informed by a surgeon who lived in Virginia, that the Indians there cure the bite of the rattlesnake by first sucking the wound*, and then swallowing a large quantity of a decoction of the rattlesnake root, so as to vomit plentifully. Now, that the decoction contributes nothing towards the cure, I presume will be readily admitted; sucking the wound, therefore, is the sole remedy, which was certainly dictated by the

Mead,
P. 40.

* This is also a common practice in the Highlands of Scotland. See *Pennant's Tour. append. p. 275.*

the natural sagacity of this people. That this cure is effectual is confirmed by the case of a man in London, who, being bit by a rattle-snake brought from Virginia, sucked the wound, and recovered. “As
 “ the poison (says Dr. Mead) of this snake
 “ is more quick and deadly than any other
 “ that we know, a remedy for this will
 “ most certainly prove effectual against
 “ that of smaller vipers, and all other
 “ creatures of this kind”—and why not of every other kind? Was not the analogy sufficiently obvious? If the poison of a serpent may be sucked from a wound, is there any reason to imagine that the *virus* in the *saliva* of a dog may not? But then the infallible *Pulvis Antilyssus* would have been of no use. Seriously, I believe, that if this simple operation were immediately and resolutely performed, no other remedy would be required. The best medicines are often the most simple, and those which are nearest at hand. We are too apt superciliously to overlook the simple dictates of nature and common sense, to the discredit of our profession, and the loss of our patients. Art, chemistry, compounds, and systems, are the hobby-horses
 of

Mead,
 p. 38.

of young physicians ; and it is not till they have grown old in the profession, that they return to Nature and Hippocrates.

100. But, though I have great dependence on this simple preservative remedy, we cannot be provided with too many weapons, offensive and defensive, against so formidable an enemy. Those who want resolution to attack the foe personally, will be glad of a substitute. That substitute is a cupping glass, or any other vessel that will answer the same purpose. If no surgeon be present take a pretty large piece of paper ; twist it gently, so that it may easily be thrust into a narrow-mouthed jug ; light the paper well, and, having put it into the vessel, fix it tight over the wound, and let it remain in that position till it may be easily taken off. Repeat this operation three or four times.

101. Ancient and modern writers on this subject have generally advised searing the wound with a hot iron ; partly with a design to destroy the poison, but particularly with an intention to produce an

ulcer. This, I think not only an unnecessary, but a pernicious act of cruelty. Let us suppose that a particle of the poison, sufficient to communicate the disease, is absorbed by a lymphatic vein, what will be the effect of the application of a red hot iron to the extremity of that vein, after such absorption? Will it not immediately shrink and shrivel? and will not the reduction of the poisonous *fomes*, by any external application, be thus effectually prevented?

102. The wound being now wiped dry with lint or tow, let two drachms of mercurial ointment be rubbed into it, and let the part be then covered by a blistering plaster somewhat longer than the wound. As soon as a bladder is perceived to have risen under the plaister, raise the edge of it, and let out the lymph; and, in order to keep it running, let it be daily dressed, during fourteen days or longer, with an ointment composed of equal parts of *Emplastrum vesicatorium*, and *Unguentum cæruleum fortius*, P. L. melted together in a very gentle heat. Let a drachm of mercurial ointment be rubbed into the fore
 I part

part of the legs of the patient every other night, and on the nights intervening let him take a bolus, composed of three or four grains of Calomel, six grains of Camphore, and a drachm of Conserve of Roses. If any signs of salivation should appear, it must be checked by a day or two's suspension, and a dose of Glauber's Salt.

103. It may possibly be asked, on what foundation I have differed from so many eminent writers in not advising immediate scarification?—I answer, because they advised scarification on a groundless supposition. They imagined that the canine *virus* was communicated to the blood; therefore they wisely ordered the blood thus contaminated to be drawn away; but I conceive the poisonous *fomes* to be absorbed by the lymphatic vessels, and, therefore, I prefer blistering the part.

104. Every person who, from the bite of a dog really mad, has received the fatal poison, whose constitution is at that time disposed for such infection, and who has ignorantly depended on sea-bathing, or
on

on any specific taken internally, will, most certainly, in the space of a few weeks, perceive symptoms of the approaching catastrophe, called *hydrophobia*. In this stage of the disease I fear there is very little probability of recovery. I have, in paragraph 72, perhaps rather wantonly, advised intoxication; I am still of opinion that it is an experiment worth trying. It can certainly do no harm. I remember somewhere to have read of opium, in large doses, being successfully administered; but I do not find this practice confirmed by experience. Powerful anti-spasmodics are certainly indicated.

105. In the 4th paragraph of this essay, I mentioned the case of a young gentleman, whom I attended in the last stage of this horrible disorder. He had been bitten by one of his father's hounds, six or seven weeks before. A day or two before I saw him he complained of a pain in the arm which had been bitten, gradually extending towards his shoulder. He had taken many doses of the expressed juice of Ribwort, which in that country was universally deemed a specific, and had
bathed

bathed every day in the river. I saw him about ten in the morning. He complained of nothing but a pain in his arm, and some little difficulty in swallowing. I ordered a warm bath to be prepared, in which he sat half an hour with great composure. I rubbed a considerable quantity of mercurial ointment into each arm, and gave him a grain of crude opium every hour, till nine or ten o'clock at night, without the least effect. About eleven he became extremely restless, and died at twelve, retaining his senses to the last moment, without any symptoms of madness, or propensity to bite his attendants.

106. This pamphlet, inconsiderable as it may appear to some readers, was not written *stans pede in uno*; it was nearly finished before the publication of Dr. Cullen's third volume of *First Lines of the Practice of Physic*. I saw, in that volume, with infinite satisfaction, my own opinion, concerning the cure of the disease in question, confirmed by that of my venerable preceptor, who concludes his chapter on canine madness with these words.—
 “ Whilst the state of our experience, with
 G “ respect

“ respect to feveral remedies now in ufe,
 “ is uncertain, I cannot venture to affert
 “ that any of thefe is abfolutely inef-
 “ fectual; but I can give it as my opinion,
 “ that the efficacy of mercury given very
 “ largely, and perfifted in for a long
 “ time, both as a means of preventing
 “ the difeafe, and of curing it when it
 “ has actually come on, is better vouched
 “ by experience than that of any other
 “ remedy now propofed, or commonly
 “ employed.”

107. This Effay may poffibly be read
 by perfons who live in the country, at
 fome diftance from an apothecary, and
 confequently, in cafe of an accident, it
 may be many hours before any mercurial
 ointment can be procured. Such readers
 will neceffarily ask, what then is to be
 done?—Whilft the perfon bit is sucking
 the wound, let a fpoonful of lard, or
 tallow, or fat of any kind, be melted, and
 immediately, with the hand, rubbed into the
 part, continuing the operation until the fat
 be entirely abforbed. Let him then take his
 horfe and ride leifurely to the neareft apo-
 thecary, who will proceed as above directed.

108. On the testimony of *Dessault*, and the Jesuit *Choisel*, particularly the latter, mercury appears to be a certain antidote for the poison of a mad dog. The first used mercury only in the ointment: *Choisel*, besides using the ointment, gave also a mercurial bolus. They both succeeded. From *Dessault's* practice we learn, that mercury externally applied is sufficient; but evidence is wanting to prove that mercury taken internally, without the external application of the ointment, will prevent the *hydrophobia*. May we not, therefore, hazard a conjecture, that the lard or fat of which the mercurial ointment is made is the real preservative? Is not this conjecture powerfully supported by the analogy between the canine poison and that of a viper, which is effectually destroyed by viper's fat, or oil of any kind, applied to the part? I mention this merely as a conjecture, future experiments may possibly discover it to be a fact: meanwhile, when mercurial ointment can be had, doubtless it ought to be preferred.

THE BITE OF A MAD DOG.

103 On the testimony of Dwyer, and
the Justice of the Peace, particularly the latter,
mercury appears to be a certain antidote
for the poison of a mad dog. The first
doses mercury only in the ointment;
Coulter holds, when the ointment gave
this a mercurial nature. I say both the
ointment, and the Justice's practice, we
know that mercury externally applied is
insufficient; but evidence is wanting to
prove that mercury taken internally, with-
out the external application of the oin-
tment, will prevent the symptoms. May
we not, therefore, hazard a conjecture,
that the fact or fact of which the mercur-
ial ointment is made is the real preven-
tive? Is not this conjecture powerfully
supported by the analogy between the
canine poison and that of a viper, which
is essentially destroyed by viper's fat, or
oil of any kind, applied to the part? I
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ial ointment can be had, doubtless it
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