Hydrophobia
In selecting a subject for an essay, one is fraught with difficulties, so completely enveloped in obscurity, a subject out of which the most able medical authors have failed in eliciting anything satisfactory, either as regards its pathology, physiology, or means of cure. I entertain no preconceived ideas of elucidating this labyrinth, comprehendible only by the most learned. Why then have I chosen such a matter for a thesis? Because, in its investigation, and the careful study of its common doctrine, I had anticipated much amusement, coupled with the gleaning of valuable information. Thus far I take it, I am fulfilling the end for which this their writing has been instituted. It cannot have been expected that every student should produce an original investigation, such facility is possessed by few, and still fewer of those few are endowed with perseverance enough to develop their talent into fruit. I could have wished to have gone more fully into the subject, to have consulted a greater variety of authorities, in fact, to have made this thesis a more worthy one; but I found that such a procedure would infringe
upon more important studies, it was necessary to relinquish my good intentions. I am not aware, however, that I have overlooked any of the more important facts, if so, I must plead as an excuse haste and incompetence in compiling. I have not detailed any illustrative cases, nor given a sketch of the disease in the dog, both of which perhaps ought to have been done. I had previously written them out with the intention of inserting them, but found that such an addition would extend the size into an unnecessary volume.
Hydrophobia.

Hydrophobia, derived from the two Greek words ωδός, water, and φόβος, fear, is a term used to designate a certain disease of a splanchnic character arising from the bite of an animal previously laboured under the affection of rabies. Much has been said and written on the propriety of the term, as not being sufficiently explanatory in its nature. The Egyptian word νευρα has been thought more applicable by some authors, among the rest by Dr. Jost. But as the alteration of an accepted nomenclature is necessarily attended with much confusion, it has been deemed advisable to retain the more generally accepted term.

As to the history of the disease, it appears to have been well known to Homer, if we may understand the expression νευρα as involving the hydrophobia of our day— but since under a more enlightened literature, and more extensive knowledge of disease, we see much confusion as to the precise nature of the malady, scepticism on this point may scarcely be considered as paradoxical. Hellebore makes mention of it twice, but the
expression as preserved is, to say the least, ambiguous. It seems to have been better understood by his contemporary Onesicritus, because, he apparently had described, and pretty correctly, both the canine and human disease. Aristotle makes mention of it, but denies its capability of affecting men. Artemidorus, B.C. 233, a native of Iberia, placed the seat of this malady in the stomach. Asepolodorus B.C. 138, makes mention of it in his history of the gods. Paelus, a follower of Herophilus, pointed out the men as a system as the seat of hydrophobia. Ade- phias referred this affection to the membranes of the brain. Hemimias, the teacher of Celsus, appears to have been well conversant with hydrophobia, inasmuch as history reports that he had been a sufferer in his own person from the bite of a rabid animal that he retained so much of the ravages of the mischief in his composition as rendered him liable to a recurrence of the attacks, when, as in lecturing, he called up the disease more vividly into his recollection. Celsus devotes a portion of his work to the symptoms and treatment of rabies, but does not attempt to point out its locality in the system. He recommends the cupping instruments, laceration,
and in cholera; and omitting the unexpected cold
bath, and subsequent immersion in warm oil,
his treatment has been little improved until up
to the present time. Even in the present day, there
are parties who have begun to advocate the cold
bath, but they give no reason further than con-
jecture, for recalling this exploded. This con-
side
Pliny the elder, both give most exaggerated descrip-
tions of the symptoms, making their patients bark,
growl, bite, and twist themselves into the most
frightful contortions... Galen and Aurelius
entertains a doubt whether hydrophobia be a
disease arising from a specific poison, or a mere
passion of the mind. Heidelberge relate, cases
where the patient died mad of this disease, and
an last mortem examination all the fluids of
the body had been burnt up, leaving the vessels
and substance dry. Lettenhoven even, that touching
or smelling an affected animal, is sufficient to
generate hydrophobia— that the sick of this malady
cannot endure the sight of water, or any other fluid
supposing they see a mad dog in it— that things
like whelps may be observed in their urine; and
this last symptom he looks upon as a certain.
indication that death is at hand. Necromus states that the twentieth day after the bite is the period at which the poison begins to develop itself; as at this time, the patient shows signs of melancholy, is sad, pensive, sees strange visions, talks, howls, eczems, and often times has fits of the falling sickness. These references suffice, at least, to show that this malady was known to the ancients, though from ignorance, superstition, and credulity, the facts are garbled, the symptoms misunderstood, and the horrors so magnified, that, with one or two exceptions, the mere fact of such a disease existing is all of the valuable which can be gleaned from their writings. The first distinct and careful report of this disease was drawn up by Dr. Dickson in the third volume of the Medical Treaties & Enquiries in 1767. In 1783, the Memoirs of the Royal Soc. of Medicine of Paris contained many interesting examples of hydrophobia communicated by dogs and influence, as is often the case in France; and these cases are treated of with an acute perception of the truth, and more scientific criticism than had previously been observed in continental writers. In 1795 and 1798 Dr. John Hunter drew up a more correct analysis of the disease. Dr. Hamilton
of Lynn Regis, treated the subject more fully and elaborately in a treatise published in 1798. An American writer, Dr. Mease of Philadelphia, published an essay on hydrophobia in 1792, and it was afterward reprinted in London, with a preface by Lettsom, in 1793. And in the present century, very many medical writers have treated of this disease, but beyond the recording of a number of experiments as to the power of inoculation, which the virus from different animals, however, nothing has been tabulated which tends to elucidate the affection. Still, while no new remedies of any efficacy have been brought forward, time and the march of science, have, fortunately, for the credit of the profession, and the interests of humanity, swept away all those dreadful remedies, by which the sufferer from this frightful malady was doomed to a more frightful death. The emaciation of the patient, so commonly preceded formerly, would doubtless give rise to a most violent resistance on the part of the patient, and hence may have arisen that fury and rage described by the older authors, but so rarely witnessed now.

In treating of this subject, I shall confine myself almost entirely to the consideration of the hydrophobia arising from the bite of a rabid animal,
merely mentioning the various affections to which the term has been applied, when the course of the narrative, or the elucidation of a statement, may require it.

It may be truly confidently asserted, that the true hydrophobia never arises from any other cause than the bite of one of the canine or feline species, previously suffering from the same malady; on this point most of the competent authorities are agreed. Experiments have shown, that other animals, such as the sheep, although capable of receiving the disease are unable to propagate it to others - either from the poison having exhausted itself, or from the virus not concentrating itself in the saliva. But the least curious part of the phenomena of this disease, is the uncertainty of the poison giving rise to hydrophobic symptoms; some authors averring that not above one in twenty of the bitten ultimately become valid. Various explanations have been brought forward to explain this anomaly, such as the variable susceptibility of many persons to develop the disease - the first ability of the animals' teeth being cleaned in their passage through the gamut.
the possibility of the animal not having closed his mouth after the last bite. Probably many causes are in operation influencing for food, or for evil, the introduced poison, of which we cannot accept have any knowledge; but which careful investigation and experiment may ultimately set at rest. Prof. Swilley asserts that its origin may be spontaneous, but limits its production in this manner to the dog, the wolf, the fox, and the cat, believing that all other animals receive it from the one or the other of these by inoculation.

Mr. Youatt holds in his letter on this disorder, that the saliva of the beagle, of the horse, and of the human being, has caused rabies. He mentions the case of a person who took the disease from a scratch received while administering a ball to a horse. An experiment by Mr. M. Magendie and Breschet at the Hotel Dieu, would seem to prove that rabies may be produced in the dog by inoculation with the saliva of a hydrophobia man. On the 19th of June 1819, they took the saliva of a rabid patient named Storck, conveyed it in a piece of lint to the distance of twenty paces from his bed, and inoculated by simple incision two healthy dogs. Both
these animals took the disease from these dogs, they propagated it to others, and so kept up the malady during the whole summer. There does not appear on record any case in which hydrophobia has been communicated from one herbivorous animal to another; and in order to explain this singular circumstance, it has been adduced that the larger salivary apparatus and digestive organs which are present in these creatures, prevent the necessary concentration of the poison. Can the disease be communicated by inhalation? There have not been wanting of authorities, who have stated that when a number of animals were confined in a small space, some of which were rabid, the impregnation of the atmosphere with the exhalations from the unhealthy dogs was sufficient to generate the disease. A number of experiments by Dr. Hering, however, were decidedly opposed to this result. Is its application to the wound attended with risk? Mr. Santay thinks, and not the case, but there are statements, the opposite of it, by Portal and Gilman, and a case narrated by Dr. Watson, in his principles of Medicine, seem to confirm the opinion of the two last authors.
There is not the same degree of uncertainty when the vein has been applied to the mucous membranes of the mouth, as in many cases on record by Gravatt and others, in which the disease has been transmitted to the human system by the debatable practice of piercing animals; this bringing the fever in contact with the lips, and there is nothing strange in this when the great absorptive powers of this class of tissue is taken into consideration. A satisfactory reply on this point is much to be desired, because the practice of sucking the virus out of the wound, which is common enough all the world over, would be the height of folly, if the integrity of the mucous membrane prove no safeguard.

As it is, nothing on earth should ever cause me into such a procedure, nor would I ever recommend it to others. This danger seems to have been well appreciated by the ancients. Celsius insists upon the integrity of the lining membrane of the mouth in the pulse, and Dioscorides recommends the mouth of the operator to be previously gargarized with wine, and afterwards lubricated with oil. Horses are said to have died mad from eating straw, upon which mad dogs had died. Portal adds, that dogs which had licked the mouths of mad animals,
were attacked by the disease in a few days.

Mr. Gilman, in a pamphlet on hydrophobia, gives an instance from Dr. Perceval, in which a mad dog licked the face of a sleeping man near his mouth, and the man died of hydrophobia, although the strictest search failed to discover the smallest scratch or abrasion on any part of the skin.

Hydrophobia appears to have been propagated by the scratch of a rabid animal, and the apparent inexpediency of such a statement may be easily accounted for by supposing that the claw had been previously charged with virus by playing about the mouth of the diseased animal. Fear has been thought sufficient of itself to give rise to the disease, and some authors have gone so far as to aver, that it never arises in the human subject from any other cause. Among the advocates of this doctrine may be quoted Sir J. Pennington and Mr. Dick. All opinions of the latter author as far as the dog is concerned are pretty decisive, though he means satisfactory. He holds the disease to be essentially inflammatory, affecting peculiarly the mucous membrane of the nose, and extending thence through the cribiform plate of the ethmoid
bone to the brain, and so giving rise to disease of the encephalon as a necessary consequence. This train of symptoms constitutes mainly, if not wholly, the essence of an occasional epidemic not confining to some forms of influenza, or hysterical disease. But the bite of a rabid animal is not always to an animal so bitten, the exciting cause of the disease, but merely an accidental concomitant in the producing disorder. The doctrine is plausible enough, but unfortunately, it does not coincide with the fact. As far as man is concerned, evidence is decidedly against it, hydrophobia having occurred where no such thing as fear could have arisen. It may be stated, that it is improbable that so many persons, who have been bitten by mad dogs, should have suffered so precisely the same train of symptoms, and at last have died of the mere force of imagination—that many of these persons have been under no apprehension whatever of having been exposed to the disease; that many, also, have been men of naturally strong minds, not at all likely to be frightened into believing that they were seriously ill, merely they really were so, and still less likely to be terrifie
into their graves. It may be asserted that the disease has affected infants and idiots, who had never heard or understood a word about mad dogs, or hydrophobia, and in whom the imagination could have had no power in calling forth the complaint. Until such evidence as this be satisfactorily cleared away, the nonspecific hypothesis will stand for nothing. That there are diseases, which, in their course, develop symptoms very analogous to those present in hydrophobia, is testified to by many eminent physicians—but there is this marked difference in the result. In the true hydrophobia, no case of recovery, of sufficient authenticity, is on record; in the other forms of the malady, recoveries are by no means rare. Dr. Hamilton, in his chapter on spontaneous hydrophobia, shows that several cases which were attended with hydrophobic symptoms, and were, therefore, reported as cases of canine madness, were nothing but cases of mania, or phrensy, excited by fear and the mental agitation arising from the knowledge of having been bitten by a dog reputed as rabid. Mr. Proctor, also, contends that the symptoms attributed to canine madness, are only a con-
fixed group which belong equally and indifferently to phrensy, encephalitis, tetanus, hysteria, when they are attended, as they not infrequently may be, with a symptomatic hydrophobia. These Hunter, and Ferrier, also quote and descant on cases of this character. Sauvages cites the example of an individual, who had every year one or two convulsive attacks, on the disappearance of which, he experienced, during some hours, a true attack of hydrophobia. The French works on this subject abound in modifications of the disease, or more properly speaking, in diseases, in which this hydrophobia is a prominent symptom. They appear interesting in connection with the true disease, only this far viz. that studying the disease in this form, may perhaps serve to direct the inquiries into a proper path for the discovery of the cause of the more formidable malady. Dr. Moreckieto of St. Petersburgh brought forward some peculiar views on this subject, which it may not be unprofitable to mention in this place. His views, the success which, according to his own statement, invariably followed his method of treatment, although holding out hopes of something satisfactory, have never,
apparently been productive of food—still, in a
tree, in hydrophobia, they are at least worthy
of mention. He maintained that the veins,
prior to its diffusion into the system, became
localized in the sub-lingual glands, and that,
at a certain period in the development of the
disorder, prior to the appearance of the general
constitutional symptoms, two small vesicles
might be observed, formed at the extremity of the
delirious dach beneath the tongue. Their appearance
he describes as follows: Par fois, elles présentent
t-il veit une tumeur charnue. D'autres fois elles
ont l'aspect d'une tumeur rouge égale et quel-
qu'elles se présentent sont le forme de petits
éprouvettes inégales, d'une couche rouge brune.
And he held that in these small tumours, the
ture presence of the veins resides; and that nothing
further is required for the complete eradication
of the disease, than their destruction. His treat-
ment consisted, in the first place, in contending
the wound—then, in watching for some time to see
if the sub-lingual vessels appeared; if they did
not, the patient might be considered safe. On the
other hand, if they did appear, they were to be
contaminated with a lancet, and the actual cautery applied to them. These measures were to be followed up by the internal administration of the Genista lutecia tinctoria. These means he holds to be insufficient to eradicate the disease in every case if early and properly applied.

Influence of climate. Nothing can be more various than the different frequency of hydrophobia, in different countries and seasons. In North America, Syria, Egypt, and Berberis, it is said to be very infrequent, and indeed scarcely known. It appears to have been imported into Jamaica, after that island had enjoyed a long immunity from the disease. Dr. Hamilton states, that hydrophobia had not been seen in the last mentioned, for fifty years, since Hamilton wrote; however, almost all the dogs in St. Domingo were affected, and from this island it was conveyed to Jamaica. Dr. Thompson states, that the dogs, kept for the destruction of rats on the sugar estates, are frequently attacked with hydrophobic. He has been informed that herds of swine become occasionally mad, biting and tearing each other. It is obvious, therefore, that the disease has been imported into Jamaica.
since 1748 at which time it is supposed the island had enjoyed an immunity from it of fifty years, and this immunity, which another had attributed to climate, was in reality the effect of accident. Dr. Haeneker states, that one of the most wretched descriptions, abound in the island of Madeira, that they are afflicted by almost every disease, tormented by dryness and heat, and thirst, and famine, and yet no valid dog was ever seen there. On the contrary, it is pretty frequent in many countries of Europe, as will appear from the following statistical table of the victims made by human hydrophobia, in the Kingdom of Prussia from Hufeland journal. for March 1814. From this it appears that the deaths in ten years amounted to 465, or

Year: 1808. 1809. 1810. 1811. 1812. 1813. 1814. 1815. 1816. 1817. 1818. 1819.
Deaths: 104. 117. 107. 85. 127. 79. 207. 228. 268. 356.

It also appears that they occurred more frequently in some provinces, than in others. They were most frequent in Marienwerder, 228, and Bromberg, 162, then in Breslau, 90, and Oppeln, 53, and in Herrn 56, and Bache 58. On the contrary, not a single case occurred in Grubens and it was rare in Dussel.
port d'Altkinj, Kolbinj, Megadourj, Munev, Amsburg, and Berlin. Dr. Hamlin accounts for this great diversity, by remarking, that the provinces in which it is frequent, are contiguous to forests containing wolves, as those of Poland, Russia, and the Ardennes. This mortality, amounting to 10 or 20 per hundred, considerably exceeds the number of authenticated cases known to have been put on record throughout the world, when Dr. Hamilton wrote his book in 1798. Philbin observes, that hydrophobia is very rare in Sweden, as at that time, 1757, not a single case had been communicated to the Academy of Sciences.

Lisse, and one or two others of the Greek Islands, have been described by the ancients as particularly obnoxious to this disease, whilst it was rare in the adjacent continent; but this was probably the result of the great number of dogs reared in them: the breed of these islands being celebrated all over the world. It is held by the generality of authors, that hydrophobia is generated de novo by the dog. Mr. Spurzheim, however, gives that rabies never arises except from the bite of a previously rabid animal. But as the prior opinion has been more generally accepted, and as certain periods of the year have
been thought peculiarly liable to favour its spontaneous development, the civic authorities have ordered that, during this time all dogs shall be put under restraint. The testimony, however, of all those who have been at the pains to investigate this matter, tends to show, that one period of the year is quite as prolific in its development as another; and that the dog muggling be, is an unnecessary waste of good intention. If any good is to arise from the restraint of these animals, they should be muggled all the year round. Mr. Hollett has stated, in his treatise on rabies, that the months of January to August, the coldest and the hottest periods of the year, are remarkable for containing the fewest cases of hydrophobia. Experiments by Magendie show that neither want of food, nor water, nor the exposure to heat and cold, even though carried to the most extreme extent are capable of themselves of developing rabies. Severe heat has been thought liable to favour a spontaneous production of this disease, but there are no positive proofs of the validity of this statement. The fact that animals in this condi-

tion come more into contact with other dogs and are on this account more liable to be bitten.
may perhaps, serve in some degree, to account for
the origin of the opinion. How does the poison
introduced by the bite of the animal act? Does it
play the part of a local irritant alone, or is it
absorbed into the system? Those who view this
malady as a mere variety of tetanus, hold that
the laceration of the nerve is the sole cause of the symptom.
Which view, although plausible enough in appearance,
is easily refuted by the fact, that where a number
of persons are bitten by the same animal, and
several of these become afflicted with hydrophobia,
no such effect would take place in a like ratio
from simple lacerated wounds. When a snuffed
car, for example, inflicts a wound in a single
individual who afterwards dies of the symptoms
of rabies, there may be reason to say that these
are symptoms of traumatic tetanus merely. But
when, as in the case of Dr. Dickson, three persons are
bitten by the same mastiff, and all die with symptoms
of the same disorder: when, as in the case com-
 municated by Dr. McLean & Mr. Edwards, to Dr.
Hamilton, five persons are bitten by the same mast
iff, five of whom become rabid and die with
the usual indication: when, in short, as has happen

repeatedly in France and Italy, a single wolf issue from the forest, ravaging whole villages and districts, biting and rending wherever he appears, and from fifteen to twenty persons as often actually fall victims to the same disease; it is not in the nature of things to suppose that the whole of these persons have thus laboured under Lunes only. In the month of September, 1772, two persons, and a great number of cows, and other cattle, were bitten by the same wolf; all of them died reaping (13 and 14). In June 1766, of five persons bitten by a reaping wolf at Givry and St. Bonneau, four died of hydrophobia; and all the sheep, cows, and dogs, bitten shared the same fate (ibid). In July 1781, three persons bitten by a rabid wolf near Aubigny, died, rabid, notwithstanding the use of mercurial virtues. Not long after, of five persons bitten by a wolf near Bienne in Dauphine, four died. Of ten persons, bitten by a wolf near Holay, in Burgundy, nine died, rabid. Of fifteen persons bitten by a wolf in the Maconnais, eight, finished of canine madness. Of 24 persons bitten by a wolf near Rochelle, eighteen finished (ibid) And lastly, in October 1812, nineteen persons were bitten.
at Bar-sur-Oise; twelve died with the usual symptoms two months after the accident (Gazette de l'Écu Sept. 1873). These examples are quite sufficient to show, that hydrophobia is a distinct disease: no one could for a moment suppose that the above were all cases of traumatic tetanus.

Again, the period of incubation is the same in the other disease, varies greatly. In tetanus, the appearance of the malady is much earlier than in hydrophobia. The wound in cases of tetanus is rarely healed when the disease supervenes. In hydrophobia, unless the bite has been very severe, the evacuation is complete. The period during which the poison may be dormant in hydrophobia, case, varies, according to Dr. John Hunter, from 31 days to seventeen months. In tetanus, the symptoms show themselves generally between the fourth and fourteenth day—i.e. the period in which they did not commence later than the 21st day. Further, in the tetanic malady, the excitations are principally excited through the agency of the different nerves of the spinal cord; in rabies, the phasmatic attacks are mainly excited through the nerves of the facial sense.
If further evidence were wanting, it might be found in the fact that genuine hydrophobia never follows the bite of any other animal than one of the canine, or feline, family. This statement, however, has been denied by several authorities among the rest by Morgera, Fothergill, Vaughan, in Hufeland's Journal of Brief Medicine, a case is narrated of a raving female beast, which attacked two boys. She bit them both, but fastened herself on the thigh of one of them, and was destroyed in the act of sucking his blood. The poor fellow died of hydrophobia, but the other escaped. It has been objected to such statements as the latter, that they were mere cases of tetanus with hydrophobic symptoms, or a sort of nondescript malady, with great nervous disorder and cerebral excitement. Perhaps it is taking too exclusive a view of the matter, those who speak so positively, most certainly open the way for the application of the same explanation as the above, to the ordinary cases of canine hydrophobia. Again, in hydrophobia there is not the locked jaw and tonic spasm of tetanus! In the non-furious form of rabies in the dog, however, the mouth is often and present-
an appearance of being spasmodically held in that position, but such is not the case, on an attempt being made, it closes with the greatest facility. A tetanus would be the grievous overflow of saliva, the convulsive, chronic purulent, spasmodic, and mental alteration of hydrophobia. A bite through the clothes is less liable to produce hydrophobia than a naked bite; it is not so with tetanus. If it be said that there is an analogy between the exciting causes, the spasmodic paroxysms, and the fatal results of the two diseases; it may be answered, that this analogy entirely fails in the diagnostic particulars; and perhaps still more essentially, in the fact that tetanus never engenders madness, or a state of being in the lower animals, and is never communicated by a bite from one to another. Is the poison absorbed into the blood, prior to its action in the system? Such would appear to be the case from the following facts. If early excision and cauterization be accomplished, the patient may be assured of positive immunity from the disease. Some authorities, as Mr. York, aver that mere cauterization is sufficient. The success
which he experienced in this method of treatment, was to the last degree satisfactory; in four hundred cases, all of which were undoubted examples of hydrophobia, it had not a single failure. Prior to the constitutional development of rabies, inflammation may be observed coursing along the lymphatics from the bitten part, which is beginning to open up and assume the character of an unhealthy sore. This is attested by Mayo and Abernethy. But denied by Marcel, Babington, Halliden, & Barddeley, who assert that these remote distant pains, seem always to follow the course of the nerves, and do certainly never influence or irritate the lymphatic vessels & glands in the vicinity, though passing in a parallel course to the trunk. There is a contradiction of statement which is somewhat difficult to account for; I presume that the latter gentlemen had not examined with sufficient care, or else that the local irritation had not been very great, and that the poison had been taken up by the lymphatics without the development of irritation in their structure. Dr. Barddeley attribute the work of absorption entirely to the veins, and this opinion.
he holds to be supported by the circumstance, at the commencement of the disease. In what part of the animal's system is the virus secreted? Most authors state that it is matured in the salivary glands, but Mr. Folliet denies this statement, averring that its origin is in the phlegmonous tissue or (here) which is secreted by the inflamed tracheo-bronchial membrane. It does not appear to exist in the blood, at all events it is not present in this fluid in a sufficiently concentrated or sufficiently developed state, to be capable of propagating the disease by inoculation. Of what part of the animal economy does the poison mainly act? Little can be derived from post mortem appearances, to establish anything satisfactory as to the seat of the malady. But from the symptoms during life, the beneficial influence of the poison appeared to concentrate itself principally, if not altogether, on that portion of the nervous system from which the organs of respiration are supplied, i.e., the medulla oblongata. The appearance of delirium, however in these parts, rarely exceeds a simple turgid state of the vessels, and this is by no means an indurated concomitant.
The course of the disease may be divided into two stages, viz., the period of incubation and the actual presence of the malady. There is little or nothing to be observed in the first stage, which, apart from the bite, could give rise to suspicion. The wound heals up with facility, and the cicatrix differs not, in any degree, from ordinary cicatrice. There is, sometimes, a certain amount of pain present in the part from the first, but this is by no means always the case, and might also occur in any wound. Many cases are narrated where a kind of fever supervened, and continued until the development of the true symptoms of the disorder. This again might arise from any local irritating cause. In the period intervening between the healing of the wound and the accession of the secondary stage, some individuals have been observed to become retired, gloomy, and melancholy, the countenance expressing considerable anxiety; but these symptoms may have taken origin in the knowledge of having been bit by a hydrophobic animal, and in the fear of an impending calamity. After an uncertain interval, which lies for the
most part between four weeks and eighteen months, the following symptoms begin to be noticeable. The patient experiences pain, or some uneasy or unnatural sensation, in the region of the bite. The cicatrix tingles, or aches, or feels cold, or stiff, or numb. Sometimes it becomes visibly red, swollen, or livid; on one occasion a peculiar eruption took place around it; sometimes it opens a fresh and discharges a peculiar ichor. The pain or uneasiness extends from the sore or scar towards the central parts of the body: i.e. if the bite have been inflicted upon a limb, the marked sensations extend towards the trunk. When these symptoms have been present for a short time, the true signs of the specific effect of the poison present themselves. They are, much anxiety of countenance, pain in the head, tremors, sometimes there is chilliness like that preceding fever, loathing of food, with occasionally nausea and vomiting, dryness during the day, and sleep by nights. A peculiar stiffness begins to be felt in the muscles of the neck and tongue. Suddenly the patient finds himself unable to swallow liquids, and every attempt to
do so, is followed by violent convulsions of the muscles of the abdomen. This phenomenon is present in various degrees in different patients, some being able by little management to swallow a quantity of fluid, and there are occasional intermissions in the disease, during which the patient can swallow with comparative ease. The pulse is generally rapid; it has counted 150 beats in a minute. There may be vomiting of dark-colored greenish matter, eructation, reflection of the bowels, great pain in the region of the diaphragm, restlessnes, and heat of skin. The thirst is intense, and is a most painful symptom. Bright color, a strong light, acute sounds, especially the sound of water poured from basin to basin, even a simple vibration of the air by a movement of the bed curtains, is a source of great disturbance, and will often bring on a paroxysm of general convulsions, or aggravate the tetanic constriction. M. Bollée makes mention of a sensation of unusual heat referred to the chest, preceded and accompanied by a suffocating vapour, sometimes confined to the neck and chest, sometimes spreading to the belly, in some instances.
Traversing the whole person from head to foot, and causing a convulsive shivering. To this internal burning, Mr. Hollick applies the term hydrophobia; he regards it as the same symptom that is chronicled by Democritus under the appellation of incendium nervorum. The eye, according to Dr. Godd, is baggy, flabby, friable, and tumid with blood, from the violence of the struggle. Dr. Bardeley's statement is somewhat different; he says, there is a peculiar brilliancy, a wild and sparkling expression of the eye, compared by authors to that observed in incipient erysipelas, and a retraction of the angles of the mouth, approaching to the hardome grin. The patient is troubled with a rapid secretion of thick, tenacious sputum, which adheres closely to the back part of the mouth, and requires great effort on the part of the patient to expel it. It is the coughing caused by the effluxation of this mucous, which sensitive imagination has metamorphosed into a ghost. This is a most distressing symptom, especially in the latter stage of the disease; when the muscles, from exhaustion, are unable to perform their office. The restless is extreme; all attempts at relief are futile, the
patient starting up now and again, in utterable anguish. The mind is generally affected, but not always. When it is so, it generally shows itself by inordinate logorrhea while engaged in conversation, evinced by the patient rendering longer answers, and dwelling more on particulars than is natural. Nothing, however, can be more various, than the manner and degree in which these symptoms may be present in different individuals. Their presence and intensity depending upon the difference of constitution, or some other accidental casualty. For some hours before death the patient often recovers the power of swallowing liquids but so far from being a favorable symptom, it generally indicates, that the end is approaching. The vital powers become weaker and weaker and death takes place in the manner of asthma.

Diagnosis. The symptoms are extreme difficulty in breathing, the pulse and frequency of the pulse is increased. There is generally intense thirst, extreme irritability and apprehension. Spasmodic contractions of the muscles of the face, neck, and
The respiratory apparatus, sometimes extending to the whole body, chiefly brought on by the sight, hearing, or thought of fluids. The diseases with which (in the absence of suspicion of a vom, or other contact with a rabid animal) hydrophobia may be confounded are, fever, mania, tetanus, phrenitis. In the incipient stages, melancholy, hypochondriasis, and hysteria. From all these it may be easily distinguished by the history and progress of the case, the dread of water, the salivation present in hydrophobia. By the sleep being of a chronic character, expected mainly, and the organs of special sense, and by the presence of lacrimation. In tetanus, the disease which of all others is most liable to be confounded with it which is rarely aneurism to fluids, and none of the salivation of hydrophobic. The spasm of the muscles is more continued, less remitting, more intermittent. In tetanus, the mind generally remains unconquered to the last; in hydrophobia it is generally affected, and delirium is by no means uncommon. The period at which the symptoms manifest themselves is earlier in the former than in the latter disease.
Mort
d. An.

In respect to the morbid appearances presenting them-
selves after death, there is perhaps scarcely any
disease in which account differ more widely! In some cases there are pathological
lesions sufficient to account for most of the
symptoms during life; in others, again, very little
structural alteration is to be observed, and often
no morbid appearance whatever. Thus in a case
narrated by Dr. Savare, and in Dr. Mellet's case
given in his Reports, the lung are stated to be
solidified as in inflammation. In Dr. Beddoes;
first case, (Medical and Physical Journal, vol. xx.)
the mucous membrane of the larynx and trachea
appeared considerably inflamed, tinged with blood
from the glottis to the bronchi. In Dr. Blackwic-

case (Med. and phys. Journal vol. v.) the mucous mem-
brane of the glottis and the windpipe down to the
ramifications of the bronchi showed evident marks
of inflammation, and contained considerable
mucous secretion similar to that spit up during
life. Once again, in which no inflammation of
the air passages could be observed, are described
by M'cree, Rutherford, Brandreth, Watson.
In Dr. Torria's case, the pericardia and ventricles contained limpid fluid. In Mr. Wharton's case, unusual vascularity of the membranes, and baro-cremasion of fluid in the ventricles, are ascribed to the effect of a fall sustained sometime previous to the fatal event. In a case narrated by Dr. Bardoloy, where the patient died in seven days from the period of his first experiencing pain in the better part, and in fifty-eight hours from the commencement of the hydrophobic symptoms, the following mortis alterations were observed:—Brain. Vessels of the dura mater prematurely distended with blood, the vessels ramifying in a disordered manner. Pituitary somewhat distended, and a larger quantity of fluid interposed between the membranes than usual. Left ventricle with the usual quantity of fluid, the substance of the brain of the usual consistence. When viewed in slices, the surfaces showed numerous brown spots. The vessels of the cerebellum were more than usually turbid, and somewhat more of fluid than usual. Platygy and gargy, no appearance of inflammation. Fossa temp. perfectly sound. Heart flaccid; no evagination
in its cavities. Two ounces of fluid within the pericardium. Pericardium. Upon opening the pericardium, a substance was found lying closely within the orifice, without filling up the cavity. This membrane was nearly the length of the pericardium; when inflated with the blower, it assumed a tubular appearance. The abrasion of the internal membrane seemed to extend as far as this substance. The external membrane had a dark red color. The white internal surface was dotted with nipple-like suffusions. Stomach. Contents about one pint. The external membrane of a dark red color. The internal membrane was covered with bright dark purple-like suffusions, especially about the cardiac orifice. The intestines were sound; the liver was of the usual healthy character. Appearance of bladder natural. In the other four instances described by the latter author, the symptoms differed slightly both in their character, intensity and extent. In the two cases narrated by Dr. [Blank to Bestor of medicine) the symptoms were the following: First case. Blood and serous fluid escaped in the removal of the calvarium. The vessels of the membranes were full, and the brain
itsy was mottled somewhat by its vascularity. Here were a few spots of ecchymosis on the heart. The back part of the heart was vascular. The stomach presented the most noticable appearance. There was a quantity of brownish colored mucus on its inner surface, and the mucous membrane had disappeared from a space about four wide in diameter, at its left and larger end. That space alone was diaphragm; its edges sloped inward, and a segment of this thin place looked exactly like a piece of tissue. On a white ground there were indistinguishable vessels, some of them blue, and some of them of a coffee color. Dr. W. thinks this latter appearance to be owing to the action of the post-mortem juice after death. Case second, the posterior and intercostal surface was very livid. The blood everywhere quite fluid. The veins of the spinal cord, in its posterior part, were tepid, not at all so in the anterior. The substance of the cord was quite natural. There was some fluid in the ventricle. The brain appeared to be in every part, quite sounds and healthy. The head and face, which had been hanging over the table while the
That canal was viewed from behind, were deeply purple as though universally bruised. The color diminished rapidly after the surface was bleached suface, and the head raised somewhat above the level of the body. The papilla at the back part of the tongue were greatly exaggerated, and looked like large vesicles. The cartilage of the pharynx at its lower part, was red. At about the middle portion of the cricopharynx, there was an appearance as if the cuticle had been abraded. The mucous membrane of the stomach was soft, and red here and there, with a dotted injection resembling ecchymosis, especially in its tip. The passages were apparently healthy. I have selected these few cases as a fair specimen of the mortis lesion observed in this disease after death. Of course they do not, by any means, comprehend all the varieties of the most mortis appearances, but they may be said to present a fair type, of which the remainder, numerous though they be, are but modifications.

What then, is to be said of the treatment of this malady? Obviously, in the first instance, we should endeavor to ascertain the history of the case.
whether the dog, which had inflicted the bite, was healthy, he
was lively and fed. And, in every case, where doubt existed,
to preserve the animal, so that should he prove healthy, we may
have an opportunity of showing him to the patient, and then, remove from the
patient, that dreadful fear of a subsequent development of the disease which might render his
existence miserable. In the treatment, our first
object should be to remove the abscess, before
time shall have been given it to develop itself
in the system. How is this to be accomplished? Mr. Spratt maintains, that the application of
cauterization alone is sufficient, and although this
practice in his hands, has been very promising,
the testimony from other quarters has not been
anything like so satisfactory. It is the best of
arsenal plan, to remove the whole rotten part
with the knife, or alternatively, to cut
the cell into which a penetrating tooth has gone, must
be cut out. Let a skewer be adapted, as near
as may be, into the form of the tooth, and then
be placed in the cavity formed by the tooth;
and next let the skewer, and the whole cell
containing it, be removed together by an illus-
general incision. He may examine the removed cell to see if every portion with which the tooth might have come in contact has been taken away; the cell may even be filled with quicksilver, to see if a fistula will escape. The efficient performance of the operation, does not depend upon the extent, but upon the accuracy of the operation. After the removal of the tooth, the wound ought to be cleansed freely. But in order to make assurance doubly sure, I would cauterize, incise, & cauterize again. By applying the cautery in the first instance, before the incision, I should most probably chemically destroy the poison, and thus in the subsequent incision the risk of carrying some virus along with the knife into the healthy tissue would be avoided, or at least, considerably lessened. This procedure seems to be carried to an unnecessary extent, but in a disease so fearful, no amount of precautionary measures can be termed extravagant. It has been proposed to fill the wound with ink, and then with the sour until it be perfectly clean. This practice may be adopted where the patient will not submit to any operation, but the surgeon who
would take such uncertain measures (the patient being ill) would be futile, to say the least, of great indiscretion. Various cauteries have been employed in this disease by different practitioners. Mr. Griffith recommends the use of nitrate of silver. Tolstoi advocates the hydrochlorate of Antimony. Other authors prefer nitric acid, caustic paste, each adducing reasons for his own favorite escharotic. It is difficult to determine which is the best, but perhaps the nitrate of silver is preferable, at least it is most advantageous in the destruction of other lesions, as the syphilis. It has been thought advisable by certain German physicians to keep the wound discharging for some time by means of irritant substances, such as the pubis lymph, and this practice may be useful where the part cannot be thoroughly incised or cauterized; but after proper incision it is unnecessary. The application of the cupping glass after incision certainly cannot be productive of harm, and it would tend, to a certain extent, to lessening remaining errors with the blood. Where the situs is of such a nature, so situated, that it cannot be excised, it is held by many surgeons, among the rest, Mr. Samuel...
levee, that, under these circumstances, immediate
amputation might be warrantable, before the
accession of the symptoms. Dr. Kaye holds
that a thorough washing of the wound is the best
method of treatment: he says, "the plain and
obvious means of preventing any future injury, is first to
wipe off the spittle with a dry cloth, and then to wash
the wound with cold water. After a plentiful supply
of clear water may be applied with safety and
advantage: and not slightly and superficially, but
abundantly, and with the most persevering attention.
In bad cases, for several hours a continued stream
poured from the spout of a teapot, or kettle, held
up at a considerable distance, is peculiarly well
adapted for the purpose." Then the period of
incubation is gone by, and the true symptoms
of hydrophobia are developed. there is no remedy
known which is able to eradicate this general which
may mitigate the disease, and of these oil in their order.
Of the various of serpice, it may be premised, that they
entertain no inherent virtue whatever in this matter,
but still, as their in hydrophobia, they are at least
worthy of mention. The most celebrated were the
Angier medicine, the Mustard medicine, the Benguin medicine.
and the culis acetabysus. The first of these was a
compound of mercury and arsenic; the second was
a mixture of alum, salt, bile, armeniac, elecampane,
and vit. anisetis; the third was made up of cin-
nambar and musk; and the fourth was composed
of black pepper and ash-colored liverwort. Other
medicines, vaunted as specific, have been, and
are being brought forward continually, but none of them
do far have stood the test of experience. The injection
of sperm into the veins, as practiced by Dupuytren
and Maferdie, the vermifugation by freeth, the
use of belladonna, heroicunctions, the aqueous
solution of chlorine, the acetic acid of the Italian
school, have all proved non-specific. It is clear
that palliation is all that we can effect in the
present state of our knowledge of this disease. What
are the remedies which may be employed toward
this end? The following have proved satisfactory
in many cases: viz. Utrica, balsam, arns, arsenic,
belladonna, hydropyrenum, the injection of grasse into
the veins, counter-irritation at the back of the neck, ice
applied over the spine, pomesic acid, lead. They require
to be administered in greatly exaggerated doses.

Based of a case in the Monthly Med. Journal for 1867
in which three pints of hydrochlorate of arsenic were administered every half hour, until the patient had taken so great an amount as forty eight pints. Chloroform must probably be as a palliative in hydrophobia, but further than this I think not think its beneficial power will proceed.