Thesis

on

Hydrophobia

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Hydrophobia

Definition and Derivation of the term. This terrible
malady, belonging essentially to the nervous system, characterized
by great restlessness, and irritability of the mind, deafness, and
difficulty in swallowing fluids, accompanied by chronic swelling
of the Pharynx, spastic konstriction of the muscles of the chest, and
abnormal sensitivity of the special senses to external impressions.
With regard to the nomenclature of this disease, Hydro-
phobia (from wor'gosis, fear) assumed as a name for the whole
divisive phenomena which constitute the affection resulting
from the bite of rabid animals, denoting as it does the chief symp-
tom—the fear invariably by which it is demonstrated in the
human being—in contradistinction to the numerous attempts which
have been made to introduce more descriptive of the disease,
still that by which it is known in the common language of the
inhabitants of France and England, and under various names has
translated amongst all the nations which inhabit Europe.

Of the synonyms which have from time to time appeared I may
notice the following: Hysterophobia (çyposoikhe, ñobyos phoe) pneumonia
(çobyos phoe dege fangh) Phenylphor (çeygo to avoid ñobyos water) Lachry-
mosia (çapges that causes weeping), Cano's Rabide Veritas, have been
its denominations among the Greeks and Latins. Among the French
writers it has been termed; Rabie Canina, Rabies La Rage, while
with ourselves; the term, Dyspepsia (or with difficulty, katastasia swallowing), has been proposed by Dr. Mend. Enteria Hypochr. (Aboro canine headache), by Dr. Good.

History. The records of medicine date from the earliest time. Some evidence of the existence of Hydrophobia as a disease communicated from the Dog to Man we find it described degenerately, pathetic and surprisingly faithfull, though with the phenomena disappeared into their testimony, and ordered since formidable than as present times at the present day; as little amenable to treatment, and as rare in their termination then as now, by Dioscorides, Galen, Celsus, and Ambelius, we must think it the disease originated in the Canine race—particularly the Dog—and it may be surmized from the friendship and connivance which have been existed between Dog and Man that the long date after its accession it was transmitted from that animal to Man. Some countries have enjoyed comparative immunity from what others, on the contrary have been particularly obnoxious to this disease, among the former we notice the Island of Jamaica for a period of 50 years prior to 1798 and in South America, Egypt, Syria, and Barbary it is indeed scarcely known, among the latter we remark Pelopon, Core, and some other of the Grecian islands with St. Domingo. The British Isles may be considered as ranging between the extremes, from the Annals of medicine prove it has never since its first observation been
free now, he the disease has assumed that almost epidemic character as in some countries.

Symptoms: I shall consider these as observed not only in man but with a slight notice of them in other members of the Animal Kingdom, in whom the disease has occurred, and shall after the manner of the able paper by Dr. Bumens, divide into precursorly symptoms and those which constitute the attack.

Precursorly symptoms: Considering the disease as arising from the bite of a rabid animal these symptoms usually commence with a peculiar sensation at the bite — pain, stiffness, tingling, heat or coldness, though it may be at a distance. Removed in some instance to the proximate joint amounting frequently to actual pain varying in character, often simulating that of Rheumatism, and sometimes attended with itching. The cause of the pain is that of the nerves, sometimes shooting from the affected limb to the region of the heart, and occasionally shooting pains are complained of in various parts of the body. Most accurate observers have remarked that these pains never irritate or produce inflammation in the affected vessels or glands, and I find all cases to which I have referred since the date of these remarks to agree in this particular, but with two exceptions. The one occurring to Dr. Bumens in London the other which I repeat I cannot give my authority for at present, but I know that in both cases the wound is reported as having degenerated into
an Idea and was such at the period of the premonitory Symptom, which in both cases were noticed in labor, in the groin in one, and the axilla the other, the bite having been received on the leg and arm respectively; in these I shall make some further remarks when considering the action of the Virus). The swelling at the same time swells and becomes red, livid, and occasionally erupts, discharging an ichorous matter.

These local symptoms are often accompanied by desire of solitude, silence, and dull despair, with general mental depression, the intellectual faculties remaining unaltered. Frequently, indeed, the imagination is more fertile, the memory stronger, the conversation animated, indeed both the mental and bodily powers proceeding unusual activity. On the contrary in some cases there may be the intolerance of light with dilatation of the pupil, contracted eyebrows, and sunken face, with wandering pains in the head, trunk, and limbs, pain in the head, restlessness, excessiveness, disturbed sleep, occasionally itching, momentary flushes, and blisters, slight febrile symptoms, loathing of food, loss of appetite, headache, vomiting, constipation, abdominal pains to.

These symptoms last peculiar to or following any idea which can indicate an approaching attack of Hydrophobia early all present in one patient, while every one of them have been absent in certain cases, when present varying in their duration from two to six days. In the disease take or its well-marked
characters, their accession being frequently ushered in by some secondary
general and expectation of the system, as, after a debouch, or strong
mental shock, or emotion.

2 Symptoms of the Disease. 1. The difficulty of breathing and swallow-
ing, depends on atrophy of the muscles of the Larynx and Pharynx.
The first of the actual symptoms of the confirmed disease are stiffness
of the neck, extending to the root of the tongue and hypoid cartilages,
and looseness of the throat will produce spasmodic pain at the
epigastrum. The patient experiences difficulty in swallowing,
particularly fluids, and any attempt to accomplish this are pre-
vented by choking or deep sighs; these symptoms usually of short
duration, do inspire the mind of the patient with a continual
feeling of thirst, and of the action of depletion, that any reference
to the same induces the suffocative epigastrium. Depletion becoming
more and more difficult, every attempt to swallow induces
violent spasm of the muscles of the Larynx and Pharynx, the patient
struggling most violently to expel the air confined in the chest
through the closure of the larynx, and occasionally those of the face
as the disease advances the paroxysms become in increased severity,
and force, either spontaneous or excited by the slightest noise, touch, or ray of light, though the
symptoms are generally confined to a limited number of muscles,
occuringly the whole muscular system is affected,
emulating for the time the phenomena of tetanus.
The patient's countenance at the same time exhibits a terrible aspect; expression of the utmost anxiety and alarm. The eye-brows contracted, the eyes staring, and partly, the angle of the mouth drawn upwards; approaching in effect that of the "Hins Sardouinos". These also exhibit intolerance of light and sounds, the tone of the voice is altered, reduced in some cases to a whisper, and rendered hoarse, and repeated attempts to eject the saliva, which towards the termination of the disease becomes very thick and viscous, and ultimately, runs uncontrollably over the patient, from a chin, produce irritated hoarse, which have been likened to the bark of a dog. The speech also is rendered difficult and incoherent.

6. Sensibility of the surface of the body, is lost to the touch. The most prominent symptom, the slightest impression, on the surface, in some cases even the merest touch of the skin of the hand, will suffice to produce the most dreadful convulsions. The patient perceives smells, and hears sounds from the deepest depths of the respective organs, which though real are unappreciable by the bystanders, in one instance recorded by Magerle, a dull patient heard distinctly, during the hydrophobic periods.

5. The state of the mind, are remarked among the premonitory symptoms that the mental faculties may be depressed, demonstrated by dull sleep, and an incapacity for all comfort and consolation; how they are generally observed to be altered, and we have...
evident mental excitement manifested by increased logorrhea, nervousness and exacerbated tempers in the patient, as though he attempted to relieve or hide his sufferings by ceaseless conversation, a certain amount of confusio also exist with great liability to take alarm at the most trivial causes. Paroxysms delirium is rarely present and then only during the paroxysms and towards the termination of the disease, but there often exist even soon after the commencement of the symptoms, some slight hallucinations of the mind, but from then the patient can be cooled when spoken to. It occasionally happens that one of an originally strong and resolute mind may preserve his composure throughout and be to the last inclined with sufficient courage to attempt drinking in spite of the horrors of impending suffocation, more than one patient having defined while making a vigorous effort to swallow the prescribed draughts.

The whole of the above symptoms may establish themselves in a few hours after the commencement, though in general not fully developed before the second day, and death most usually occurs on that and the third day, sometimes within 24 or 36 hours. Rarely prolonged beyond the 5th day, though in some few instances as late as the 7th day after the appearance of the hydrophobic symptoms. Death occurring generally from asthenia.

I must now take into consideration the anomalies observed with respect to the Public, the Secretions & Excretions.
The pulse varies extremely, but is generally quick and has been counted as high as 150 it is seldom strong sometimes strong and hard, fluctuating considerably during the course of the disease. The alvine secretion, perspiration, and urine have generally to continue in a natural state, but occasionally there is obstinate constipation, falling however toward the termination of the disease. In some instances the skin sometimes hot and dry in others parched, but these like the constipation generally give place toward the termination and we may then have a moist skin, a profuse perspiration. The character of the urine is little changed, in some instances it has been remarked as being of a greenish and in others of a pale lemon colour. The secretion from the calyces glands is considerably increased, more particularly toward the latter part of the disease, and at the same time is more viscous thick and tenacious. The tongue is sometimes moist and more or less furred, Nausea is also present and not infrequently a yellow, greenish, yellow, or coffee like fluid precedes the emetemata. Dense thirst often accompanied with hunger and a burning sensation in the esophagus materially increase the poor patients sufferings in the latter stages. Such is the more general progress of the disease but there are many varieties observed to occur in different individuals as among the premonitory symptoms, indeed the most
marked symptom in the disease may at times be absent, though others may be present which sufficiently characterize the disease, as in some instances where the patient has been able to take water and in others where the patient objected to the latter with the strongest aversion, yet readily took cold wine or broth. Again hydrophobia may intermit, but these intermissions have no distinct effect in lessening the disease less fatal, merely prolonging its duration, still they admit a favourable opportunity for the administration of such cures as cannot be accepted while the symptoms are predominant or most excited.

Having I think now fully considered the symptoms as they are presented to our notice in man I shall take a short description of those observed in the lower animals.

In this day the disease is said to be of two forms. The first is characterized by augmented activity of the cardiac and locomotive organs, continued and peculiar breathing "commencing as a perfect bark, ending in a howl a fifith a twelfth or eighteenth lighter than at first it is the rapid succession of the one upon the other that constitutes the distinct howl," and a strong disposition to bite. The affection commences with some alteration in the peculiar habits and disposition of the animal, who as the case may be is more irritable, more tractable, more lively or more sluggish than usual; or these general conditions may alternate in one
And the same animal. An early symptom consists in an inclination to lick or carry in the mouth indigestible substances particularly such as are cold. The animal often a time pets bocche; sniffs in the air, leaps at flies, frequently leaves the house, but soon returns, and in obdurate and démarche, is led to this master. According to Blaine's canine pathology, constipation usually exists. There is generally complete loss of appetite; but the animal seems to suffer from thirst, drinking eagerly until indeed as usually occurs the mouth and tongue become swollen. The eyes are red and particular. By night, lasting two or three days, it is dull and wasted, and a coldness steals over the complexion changing to a yellow, tinge and internal, four hours from that the eye becomes one discarnated mass. The skin of the forehead is also wrinkled which gives a peculiar aspect to the animal's countenance, the nose, tongue, and throat, now become painfully swollen and the croup appears. Cough and stearing, according to Bertin, the mouth becomes generally dry; but Blaine has consistently observed a flow of their saliva. Gomart remarks that the increase of saliva is one of the first symptoms in the dog and that it gradually becomes more viscid. After sometime the faeces become most adhesive and stapping and finally the extremities are paralysed. The tail in this form of the disease is lost between the legs.
and the head is held erect, the nose being pointed upwards.
A disposition to bite generally occurs sooner or later in the course
of the disease; it is not, however, always present, nor permanent
when present, but usually ceases periodically, and is then
directed against both animate and inanimate objects
most especially towards the enemy, less so towards other
animals, and last of all towards man. When the ani-
mal bites, he does not previously back or fly at the object of
his attack, but approaches in a quiet, or even friendly
manner, and makes a sudden snap.

The second form of the disease is distinguished by in-
constancy and depression; there is no disposition to bite
probably from the lower jaw being paralyzed, nor is there
any inclination for change of locality manifested.
The first symptoms are usually incoherent, and depression
of spirit. The voice is initially changed as it is also in
the foregoing variety, but there is much less disposition
to back or howl. The mouth is open, the lower jaw hanging
as if paralyzed, and is raised only under the influence
of strong excitement; there is also a constant flow of saliva
from the mouth, the animal either does not drink at all
or does so with considerable difficulty, but manifests no
fear of water, and on the contrary, willfully immerces
the nose in that fluid. The tongue is almost constantly
protruded from the mouth. The animal rarely survives beyond the sixth day. Thus we perceive that insatiability of the dog and daemon of water, are but outward errors in connection with this disease, some animals indeed trained to certain duties, as pointers, have performed these in the rabid state quite as efficiently as when in health. The most invariable symptom is the cough harsh back ending in the peculiar howl, which is very characteristic in the Cat that this disease has occurred to the cat and from thence been communicated to the human being is well authenticated by the cases upon record, that it does originate in this animal I should think very doubtful when we consider the natural enmity which exists between the canine and feline classes and the encouragement which all must be sorry to observe is devoted, among a certain class of the inhabitants of populous districts to the propagation of the existing animosity, by training and exciting the former to worry and destroy the latter species, and which is rendered particularly available by the characteristic predatory disposition of the latter which consequently frequently carries them into the mouths of their enemies. The symptoms in the Cat resemble in all respects those in the dog, their premonitory symptoms being invariably of the fallen character, and their decided symptoms being far
more exhibited towards the human race than in the dog. Their natural disposition to scratch being augmented by an inclination to bite, besides carrying with it for some of the truly rabid character than is due exhibited in the dog. Verily a mad cat must be a terrible antagonist!

The Wolf. We must believe that the disease exists and indeed is also originated "de novo" in the animal but from the fact, alone, that he is of the canine family, but that so many well authenticated instances of decided hydrophobia communicated to man by wounds have been recorded, indeed, that is one reason for the prevalence of the disease in Persia there in some provinces these animals absorbed in considerable numbers. The symptoms there has never been any pain of a tooth meeting in these animals, and the examination of their bodies afterward has led to no satisfactory conclusions.

In the fox the disease is comparatively rare in these animals but there exists undeniable evidence that it has been observed in them. And that man has died hydrophobic after contact from the same.

In the jackal. We learn from Mr. Priest to account that the disease exists in this animal, materially increasing his malicious propensities, and from the very mortality in the cases reported by him evidently communicable.
to man. In the Badger the disease has existed in this animal and according to continental records has been communicated from it to man.

In the Horse, the symptoms of the disease, when it occurs in this noble animal, are various. They usually, however, commence rather suddenly by some signs of uneasiness and distress, breaking out into profuse sweat, when attacked while at labour he continues alternately to draw his head and to stop distressed, and impatient; in a few hours however he becomes completely uneasy, he stamps and paws violently, attempting to disengage himself from the halter, and though madness be a complete phenomenon in the dog, it is not so in the horse. The thirst is excessive and the act of swallowing is accompanied with a distinct pulping effort. Animal chewing increased disposition to bite when he has that tendency naturally. In some cases excessive sensibility of the surface and in one case confined to the side on which the animal had received the bite. Palsies is increased in frequency. In the Sheep this harmless and indifferent animal is changed into a fierce and dangerous creature as to both of his own shadow reflected by the Sun or any adjacent wall. In the Ox and Swine decided phrenitic symptoms are present, while in some instances there exists a difficulty
of swallowing, yet true hydrophobia is rarely present though in one instance in which a pianist pig was inoculated at the Middlesex Hospital, decided hydrophobic symptoms were induced on sprinkling the animal with water. In a note Blanda reports an inoculation of this bird and its death, ten weeks after wards under peculiar symptoms.

**Latent Period or stage of incubation.** In respect to the effect of time elapsed between the infliction of the wound and the appearance of the premonitory symptoms there exist much difference of opinion, and considerable doubt is thrown on the authenticity and true nature of the hydrophobic symptoms when they seem beyond a recognized latent period, which to me appears rather derogatory when we consider the uncertainty which pertains to deciding the limits of this period in several other contagious diseases, in particular during notice the poisons of Syphilis and Pseudochoria, not only in the secondary forms of these two but also in their primary demonstrations.

With regard to the symptoms observed during this period in man, little has been satisfactorily observed a few individuals have become retired, nervous, and melancholy, the countenance expressing considerable anxiety, but as the pulse, skin, and other indexes of the functions continue normal, it seems...
impossible to affirm that these signs of depression are not the sole offspring of mental anxiety, regarding the graveyard in which they in general know but too well their life is placed by the accident, their symptoms attributed by some authors to this stage seem purely accidental. And as corroborative evidence among the lower animals, who recognize nothing so serious a feature in their future careers, no peculiar change is observable in their behavior.

There appears to be no determinate period at which the disease makes its attack after the bite, but it is calculated that the symptoms most frequently commence between the 50th and 60th day and after that period the chances of escape. Of 15 patients whose cases came under the observation of Brilliot, seven were attacked between the 14th and 30th day; five between the 30th and 40th day; two a little beyond that period, and one after the expiration of 14 weeks. In 1784, 17 persons were bitten by a hybrid wolf near Binary, of whom ten were attacked by hydrophobia. Their age on the 15th, 19th, 28th, 30th, 35th, 35th, 52nd, and 68th day after the bite, one on each respective day. A list of a table of 151 persons bitten by hybrid animals, none of the patients were affected before the 11th day and only three before the 18th.

Of the cases in which the latent period has been particularly extended, one is recorded, in which the most careful inquiry.
tended to prove that the patient had never suffered the least injury from any animal except the bite inflicted twelve years previously to the commencement of the hydrophobia by a dog apparently rabid. By Dr. Bardeley, who thinks that two years constitute the limit. Another after the lapse of seven years occurs in the practice of Dr. Burns. If Hunter considers 17 months and Dr. Hamilton 19 months as the limit of this period, while on the other hand some have extended their belief to an interval of 18, 20 and 20 to 30 years.

In this stage the disease seems to appear in less than two weeks, the average duration of this stage being 5 or 6 weeks, in 5 months.

Animal may be considered tolerably safe, though in one instance, Megawalt knew it extended to 5 and in another to 7 months. He thinks that the quality and quantity of virns play a pre-disposition in the animal afflicts the duration of this period. In the birth the development of the disease awaits the completion of pregnancy.
Causes. These I shall consider under the different heads of
Redepositing, Exciting, and Proximate
Redepositing, with respect to these we have nothing but the
most loose analogies persons of the nervous temperament, of a
crack habit of body, and melancholic, and irritable in-
dividuals, are occasionally liable to obstructions of the great
functions of the throat, breathing, and defecation and
these impediments appear universally to be of the spas-
modic kind, supervening suddenly from almost any
Exciting cause operating on this class of persons, some
particularly mental motions, paroxysm, irritation, and
agitation. But these merely evanescent accidents
have no right to be considered as having the same origin
with the terrible symptoms of human hydrophobia.
On the contrary we have already seen that the hydrophobia
of man occurs in every possible temperament, age, and sex;
consequently we cannot infer anything in common in their
origin. Indeed the excitement which produces these
symptoms in question produces the same effects in the
most robust, sedate, and firm of human constitution,
and who can tell the measure of force exerted by the cause
of hydrophobia or that, that exists in the human body an
irritability too small in degree for it to produce its effects?
Therefore the action of a nervous temperament, a melancholic
Tendancy, predisposing to human hydrophobia, attained by the result of specific views, is an ex post facto observation, drawn from what is seen in the symptoms after the disease is formed, and not a prima facie clinical remark recorded in the latent stages, and confirmed by comparison of cases.

The other causes, being those which have been observed as producing the now rabid hydrophobia, will be disposed of in the diagnosis and may well be allowed to remain in the class of the exciting causes of that distinct species to which have been well demonstrated to act as predisposing causes of rabid hydrophobia of which at present there does not exist one instance upon record.

Neither does it appear decided that any distinctly predisposing cause exists at any time among the lower animals even Gonaff does not appear to have any very settled opinion on that subject but he remarks that the disease is more general among the Linn, Lurcher and Fighting dog than the Dober or house dog, yet from any predisposing being, more likely to exist in the former, but from the fact that their education, and the slight care taken of with less control exercised over them places them more in the way of contamination and further propagation than will happen in the more secluded lives of the latter.

St. Baudelay however makes a contrary assertion, ...
Exciting causes here our information acquire a more satisfactory character. That the bite of a dog labouring under a particular form of madness is often succeeded in man by the symptoms already described, and in animals by a disease remarkably analogous, and equally fatal, is a fact confirmed by the testimony of all ages and nations. From what other animals may this disease be communicable? Undoubtedly from the cat, and from other animals closely allied to the dog and cat by natural characters as the wolf, jackal, and hyena. From the cases of distinct hydrophobia on record communicated to man and other animals from the bite of above mentioned animals, with its fatal termination, as in some instances confirmed by a post-mortem examination, whenrabid appearances were observed as responses to those seen in the dog, decidedly proves this. Perhaps in these the disease originates "de novo" though from the exciting cause, which is maintained between the dog and these animals renders it difficult, to determine, particularly with respect to the cat, in how far the disease may originate in either of these, and the exciting cause in them is equally, observe for with regard to the dog the only one decidedly under our control and suspicition and in whom the disease is allowed by many to originate "de novo"—HAVING the Dr. Gonville contends that in this animal
It is invariably communicated by inoculation — we find that on exposing their saliva to what have been from time to time inferred by various opinions to be the exciting cause of the disease, hydrophobia has never been induced.

It appears pretty well settled that herbivorous animals cannot communicate the disease, the experiment is too doubtless to attempt on man, but from the numerous inquiries on the subject at Veterinary Schools, on the Continent, and conducted by able experimenters, I think the question can scarcely remain in doubt. Many attempts were long made in vain to communicate the disease to several kinds of animals by inoculating them with the saliva of human beings who had survived the disease, both in this country and in France. The whole of the trials furnishing only negative results, but one which from the character and talent of the operators tends to establish the contrary. Magendie & Meckel inoculated with the saliva of a man who died a few minutes afterwards, who died of hydrophobia, two healthy dogs. One of the dogs became rabid in little more than a month and a half; the other, one of which was attacked with rabies on the expiration of another month. The many failures in the foregoing experiments do not exhaust all the animals inoculated with Rabies, and other animals might tend to maintain the doubt which may exist as to the probability of propagating the disease.
disease by the saliva of herbivorous animals, but that
the greater number of experiments and their invariable
failure in the latter case cannot lend me to believe with
Mr. Yorke: "That every animal concurring under the disease
is capable of communicating it."

The disease has not yet been decided as communicable
from one human being to another, though the forementioned
experiment of the splendid and venerable persons and
persons should accordingly be taken that the saliva
and membranes of a lyssphobic patient should not
be suffered to come in contact with any abation or a
second party. The disease has not been determined to
be propagated by the Breath, or their secretions, neither
by consumption of the flesh of a rabid animal, or injection
of its blood into the veins of one in health, but by the
salivary and mucous secretions, emitted by the mouth, alone.

What then is the nature and mode of action of the virus?
As doubts exist as to the particular seat of the virus whether
eliminated from the mucous membrane of the air passages
or secreted by the salivary glands, its ultimate existence
with those secretions, and in all probability its inefficiency
quantity will perhaps even render it chemical exercises
a mystery, and though writers have hoped that from
the more correct information we should obtain respecting
The manner in which the disease affects the animal results from the frequent and careful performance of experiments with the virus itself. We should obtain more intimate acquaintance with the nature of the poison, and are still involved in profound obscurity, indeed it is doubtful whether such a discovery would assist towards a successful treatment of this terrible disorder, or of the other animal poisons which materially endanger human life.

It is necessary for the action of the poison that it should be introduced through a wound or abrasion, whether it be applied to the skin or mucous surface, its absorption has most assuredly been interrupted by the interception of clothes, linen, and wool. Yet its contagion by frostbite has been so well authenticated in one instance that nothing can be wanting, but further proofs to determine this mode of contagion, though it is distinctly denied by so eminent an authority as Dr. Gouy, for in Mr. Threl-yan's kennel, though repeatedly washed and painted with fabrics, appeared and destroyed successive packs until the dogs and bitch were removed, when the disease disappeared. Is the virus absorbed into the system or does it remain in the wound? The oldest opinion of the action of the virus after being removed into the wound was that it became absorbed and mixed with the cirrhot
ting fluids, thus, effecting general infection of the solids of the human body. A subsequent theory referred it to effects produced at a prior point, and a propagation of the lesion through the whole nervous system. And another intimates that the virus lies altogether dormant until the condition of the habit be adequately predisposed to its action. This latter is founded principally on the commencement of the symptoms at the wounded point with the frequent recrudescence of the cicatrix.

That the fluids and liquids are affected generally by this poison is disproved by numerous experiments and observations. And the local effects of the injury bear no proportion to the subsequent constitutional disorder so as to furnish argument in favour of opinion that it arises from propagation of local infection. With regard to the theory which conjectures that it lies dormant in the tissue with which it first came in contact for a considerable indefinite period, absorbing everything around but leaving the organs unchanged, not entering the circulation further it would be modified or expected, and that at length the tissue becomes sensible and begins to exert its certain elements, the abundant, at the same time taking on some powerful action, attacks virus carrying it into the circulation thus assimilating other88

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In some nature, or determines to one, so altering the character of the situation that it acquires the property of propagating the disease. But this implies that it is for a time as a foreign body—a bullet for example—which I think most improbable when we take into consideration that it is a fluid impenetrable and invisible poison; but that on the contrary, it is within a short period absorbed by the capillaries of the tissue adjacent to the wound and carried direct into the circulation, thence to produce as we shall shortly demonstrate, those changes in the nervous structure which occasion the cerebral, serious, and fatal phenomena, constituting hydrophobia.

With regard to the two cases which I mentioned—where buboes occurred on the acception of the preliminary symptoms, the wounds in both cases having degenerated into unhealthful ulcers, one may view the lymphatic arrangement as dependent on absorption of matter from the wound, as nearly as susceptible and dependent on irritation of the wound, and less on the absorption of any specific virus, but as one case recovered under the external application and internal exhibition of iodine, the therapeutic action of which has in another case proved so effectually. I think there is every reason to doubt that it is decisive hydrophobia, but as the detail of the case is prior, I cannot dispute it on any other grounds.
With respect to what some men of high standing in the profession have considered as the exciting causes of true hydrophobia, some asserting that the hydrophobic symptoms have been in every case induced by fear and disbelieving allusion in any specific forms, and others again referring the phenomenon to the effect produced on the nervous system by the inflammatory changes observed after death, instead of viewing these changes as dependent on the nervous lesions, or to the form of the wound, or as an epidemic affection, commencing with inflammation of the mucous surfaces in the region of the bones of the face, extending then to the submucous plates of the ethmoid bone to the meninges of the brain, and inducing the peculiar train of symptoms which we now believe in the existence of such a disease, hydrophobia. None of them believing the production and propagation of a characteristic disease, and specific form.

It is however beyond dispute and generally recognised as truly among the profession, even for a series of apes, that the bite of a rabid animal will occasion hydrophobia for the same phenomena have been known to follow the bite of such an animal from the shortest time, and we have a similarity of symptoms in persons who have been bitten by the same animal. The disease also more frequently occurs when part unprotected by clothing as the hands or face have received the wound, and lastly.
The introduction of the saliva of the rabid animal into the system of a healthy quadruped will produce the disease. Nevertheless, it is incontestibly proved that other causes are capable of producing hydrophobic symptoms similar to those attending the bite of a rabid animal, and independent of systemic epileptic, animal complications.

Primary causes or Theory of Hydrophobia. Having already shown beyond all rational contradiction that hydrophobia is the result of a certain poison introduced into the system of the animal which it affects, I came to the consideration of the morbid processes of the exciting cause. The essential symptoms of this disorder are insufficient to demonstrate that it is dependent on a pathological condition of the nervous system, and in what this consists it is difficult to determine.

Some as I have mentioned have considered the nervous component as a consequence of the changes which are found in the pharynx and esophagus, others to inflammation or congestion of the membranes of the brain, while a third party have viewed it as dependent on spinal irritation.

I think that the virulent virus absorbed into the system to modify the nutrition of the nervous centers, perhaps more particularly of the medulla oblongata, constituting, in the occurrence of phrenic, similar to peripheral shock a sensation in the nervous system. A source of central irritation of the nervous system demonstrates
through the considerable pain experienced by some parts, principally the medulla oblongata, affecting especially the nerves originating from it in connection with that part of the brain. The same excitement extending also to the whole centre of sensation, which partly accounts for the phenomena exhibited. The precise cause of the development of this state of the nervous center we are at present unable to account for. Indeed we cannot state how slight an amount of change or irritation of the system at large, or any part in particular shall exert its influence so as to develop or produce the ultimate exciting cause of latent alterations. But in many cases we can trace this in hydrophobia, in one instance a man is imprisoned, in another a youth witnesses the capital punishment of a fellow creature, another again is frightened by the fiends of his own mind, again it is through want of employment, while a wife and children are dependent on him for support, all of these have an effect upon the nervous system which may be either exciting or depressing, for in one case a man indulged in extraordinary frights, all these suffices are sufficient in some individuals to develop latent lesions of the nervous centers which might perchance never have developed, at least not until ultimate changes occurred, but for these effects.
The pain sensations are generally experienced in the wound part or cicatrices, which I believe to be easily accounted for by the regeneration of the nervous fibres implicated in the wound from the affected blood, then on the development of the centre lesion. The recurrence is first perceptible at this part of the periphery, by transmission from the affected sensory, maybe because it received the prior impression and from the fact that newly built up tissues are the most prone to take on motor actions forming an index of what shortly shall in most affect the whole periphery.

On the same ground also I account for the frequent recurrence of the cicatrices by the lowered vitality affected through the nervous tissue of newly regenerated structures. In many instances, I think the morbid phenomena found within the brain or destruction may have been primary and not dependent on the disease but have caused the development of the peculiar and latent nervous lesion. 

Anatomical Characters in these no uniform appearance have been present after death. The brain frequently presents signs of congestion. The vessels and sinuses of the membrane are frequently injected, and more aless effusion enters into the cavities of the ventricles, and those of the cerebral and subcerebral. The surface of the brain has also been observed studded with seckit points and the plejus.
The spontaneous formations of coronal mass ejections
chondroid of a brown color, and gorged with blood, and in some cases there existed a placenta of vessels surrounding the origin of the optic and oculomuscular nerves, blood also had been found extravasated in large quantities at the base of the brain. Sometimes the substance of the organ has been softened in other cases indicated. Some deposits have been met with in the brain and the meninges. In other cases no alterations have been observed within the brain. The spinal cord has been found contracted, in the case crowded with blood; in some instances considerably inflamed. Sometimes with collections of serum within the spinal canal. Some deposits have been found in the arachnoid of the cord occasionally in parts it has been found softened. On the other hand no alteration whatever has been present in the spinal canal or its contents, in the pharynx and trachea no marks of inflammation have been most generally observed in some cases deposit of lymph, acquiring the characters of a false membrane have been observed, in others no morbid change has been discerned; these parts being covered only by a fetid membrane. The mucous membrane of the stomach and small intestine have been found considerably inflamed, sometimes almost gangrenous. The salivary glands occasionally large and vascular. The lungs have often presented a deep red appearance and gorged with blood.
The lungs, trachea, and bronchiae have presented traces of inflammatory action, and in most instances lined with a thick, white, fleshy membrane. Heart sometimes containing air.

All of these appearances may be present in the same body, in others one only may be found; in other again, no alteration has been observed either in the nervous, circulatory, respiratory, or digestive organs.

In the lower animals, similar morbid lesions are frequently observed—particularly traces of inflammation in the pharynx and esophagus, frequently also, extending to the stomach. That these lesions are not essential to the existence of the disease is proved by the fact that in many cases they are entirely wanting when present. They are particularly in the trunk must be admitted as the consequences, not the causes of the disorder. Some of them do doubt accompanied by the evidence of the convulsive movements which accompanies this disease, others depending particularly on the development of the morbid action being demonstrated chiefly through the damaged functions of the eighth pair of nerves.
Diagnosis. Hydrophobia when perfectly developed presents peculiarities which distinguish it from all other disorders, though in the commencement of the disease there is habit in which the action is present, and it may be mistaken for Phrenitis, Mania, Epilepsy, Delirium, and in the incipient stage, for Melancholy, Hypochondriasis, or Hysteria; particularly in cases where no recollection of any wound exists, which very loss of recollection is decidedly in contradiction to the theory which holds the disease to be one of the imputation alone, but only for a few hours from the commencement. Hysteria and Hypochondriasis advance by slow degrees, early have fever, tenderness of skin, or increased salivation; Melancholy is altogether a chronic disease. View her convulsions, opress of the breast, difficulty of respiration and vomiting among its symptoms. Certainly in Phrenitis we have stupor, increasing fevers in skin, convulsions, and difficult swallowing. Let there be an affection of the respiratory apparatus, or salivary glands. From Mania it is distinguished as soon as the difficulty of swallowing, opress, and salivation appear.

Eclampsia in many cases actually supervenes in the disease, but where it does occur it is rarely a primary symptom. Yetanna is the disease with which it is most apt to be conjoined, yet the differences are insufficiently marked. The spasms of the muscles in more continued in Yetanna; the vomiting and
new interesting. The paw is usually much in motion in hydrophobia, in frequent attempts to show the mouth and thrust from the peculiar tenacious manner in Tetanus it is fixed. Tetanus is rarely attended with aversion to liquid, on the contrary the latter is grateful; but we the tetanic pain, soon increased by the sight, touch, or touch of fluids, also Tetanus makes its appearance much earlier after the infliction of the injury. Physiologically while Tetanus is a disease of the true spinal cord. Hydrophobia involves the brain also as indicated by the disorder of intellectual function and special sense, even early in the disease. While in Tetanus the stimulus which excites the paresis, operates through the true spinal cord, in Hydrophobia it is often conducted from the pons of special sense or even from the brain; so that the sight or sound of fluids or even the idea of them occasion, equally with their contact, or with that of a current of air, the most distressing convulsions. Thus the two diseases differ partly in their mode of induction. Tetanus is caused by irritation of a nerve in the traumatic cases, by disease of the spinal nerves in those which are idiopathic. Hydrophobia is the result of a specific poison introduced into the circulation and thence affecting the nervous system.
Treatment may be divided into the prophylactic and curative. Prophylactic in consequence of the little control which medicine has over this disease when once fully established, the prevention of the disease is therefore the principal means of escaping the extreme suffering and dreadful death which lay a constant fear in general occasions. Of all the methods which have been proposed for preventing the complete invasion of the bitten part and the immediate application of a powerful caustic to the clean surface is that which undoubtedly merits the greatest confidence.

Previous to which, in case of delay in procuring instruments and applications, the wound should be perseveringly washed with lukewarm water, a continued stream as from the spout of a kettle may be directed on it. Exercise must be had recourse to as soon as possible and every care taken that it is efficiently performed and that no part which may have been in contact with the contaminated tooth be allowed to remain. Various writers think that caustic alone is sufficient to incite destruction of the virus, and many remedies of this class have been recommended by the actual canterby, Tritic, Sulphuric and Hydrochloric acids, Potassium nitrate of silver, Bitter of Antimony, &c. With great preference the nitrate of silver is preferred as it produces a hard dry and insoluble ulcer, whereas most of the other produce a soft, soft fluid mass in.
which the virus is suspended from which inoculation may be effected. He considers that human canker may when thetoes are produced to a point may be introduced with all certainty into every recess and sinuosity, recommending also that after the application the wound be healed promptly in the mildest manner, he then expect he is exposed by several continental authorities who by the application of stimulating substance keep up suppuration for some time or even apply a blister on the wound afterwards dressing it with a ointment or powder of rhubarb.

Some again make deep incisions of the wound and employ also general bleeding. In Russian practice those unfortunate enough to have been bitten by a rabid animal are exposed, for a home with the wound uncovered, to the temperature of 122° Fahr. While in the bath Decort, Songer and Guerassim are administered. The baths are repeated every other day, during the second week, every third day, and afterwards twice weekly until the expiration of two months from the beginning of the treatment. The wound at the same time being rubbed with frequent hydrogen and kept open by irritating ointment. Dr. Monachetti recommends opening and cauterization of characteristic punctures, which he asserts appear under the tongue by the side of the frenum, where he believes the rabid virus to appear, but these punctures
Monument was by Calcas

This too strange—
Valladona Scudellare
have been sought for in vain by many, their existence and specific character is doubtfully and when observed and caterized the extraordinary average of complication from the decided symptoms of the disease has resulted.

The application of a small effering plaster over the wound has been recommended by Dr. Barry. Dr. Good advises the application of a tight ligature above the laceration. Experience has sufficiently proved that all internal remedies, with a view to preventing the accession of the disease are completely inefficacious. With regard to the prophylactic local treatment, so long as the great majority of individuals bitten escape without edema of any kind considerable doubt will exist as to its utility; yet everyone will be happy to at least try it in some form or other, in the hope of exempting from the terrible and intolerable sequels and it is the duty of the medical attendant to propose, as almost insist upon the local prophylactic treatment. Of the various doubts, excision and catenization may be the most reasonably chosen, both as is the practice of most medical men. In the present day, with all due care that each is efficiently performed. The excision, amounting even to amputation in the case of a severely lacerated wound complicated with injury of the smaller bones, and even to excision of the cicatrizing at a late period after the bite for though we may
not believe that the poison is latent in the wound, still our patients may have that idea and doubt the much greater anxiety and distress would be relieved by the procedure, indeed cases are reported in which excision and cautery have caused the hydrophobic symptoms, after the desired accession and recovery occurred. Cauterization after the extensive experience and favorable results in the use of steam, of the nitrate of silver it is generally admitted as sufficiently effective. Someone it would be advisable should the latter be in a favorable situation to apply a lipatine above the broken part until further measures are resorted to. It is also requisite that the patient mind should be relieved as much as possible by change of scenery, occupation, and his attention made quite subject in his presence.

Treatment on the Occurrence of Hydrophobic Symptoms

As yet we have no remedy which with any certainty or dependence we can expect to stay or even delay the almost invariably fatal termination of this destructive malady. Still cases are not wanting in which recovery has occurred but the remedies which were judged to have proved available in those few instances have been decidedly in effect in innumerable other cases. Before introducing any views of my own with respect to the remedial measures to be
employed it will be well to revert to the various therapies
then considered proposed through an extensive period, and in
various countries by the most experienced and sagacious
physicians. Injectives have been tried both in this country
and in this Country with a view of overcoming the nervous
excitement, but without success, as much as 100 grains of
opium having been administered within twelve hours, the
injection of the same has likewise proved unavailable, and
from the subcutaneous application of Morphine, along the fleshy
surface of the spine, slight transient relief but no permanent
benefit has been obtained; the same result was attained on
an injection of its solution into the cephalic vein.

Belladonna, Lobelia, the cold effusive. Euphrasium, Warm
Baths, Brides of Lead, have for a time alleviated some of
the symptoms but nothing further has resulted from their use.
Stimulants and Tonics have been administered with a view of
supporting the patient until an anticipated and hoped
for crisis should occur, after which he might recover; but
with these may be classed Electricity and Salviniust, but
from all, nothing but a temporary benefit has accrued.

Mercury, Arsenic, and Ammonium, other powerful metallic
preparations have been prescribed with a like want of
Sudorifics, Diaphoretics or purgatives; there is scarce time for
full operation of the two former, the latter should be adminis-

tended to produce the necessary effect once but cannot be viewed as an efficient remedy. Numerous other remedies have from time to time been recommended, but with no certain benefit. Injection into the veins has been recommended and employed in the case comparative benefit was the result.

Inhaling has been recommended by the Magus but I think with little hope of success from it alone for it cannot relieve the excessive nausea irritability and the patient usually the asthmatic but more generally during an interval of quiescence and relieved from the oppression, sinking ultimately from extreme exhaustion. Bloodletting has many advocates having been performed to a great extent with occasional successes; indeed, it is the remedy which has been most constant in inducing a favorable termination, I cannot help thinking that this is in all rationality the only curative treatment which has yet been attempted in which we can place any hope.

All other sedatives of the nervous system have been adopted with little or no success and I believe that up to this date the publication of a new system of hypnosis to avoid reaction or if such should occur, there is greater hope of the action of sedatives toicl in due such reaction proceeding without after depletion, though they may have been ineffective and prior to it, along with this I would recommend the endoscopic application of morphia or atropia in the course of the spinal column.
Chloroform since the boon conferred upon Society at large and our profession in particular by the discovery and disclosure of the valuable anaesthetic powers of this therapeutic agent by our learned and talented Professor of Midwifery, Dr. Simpson, its adaptation to the treatment of cases has been and been destined to be. That its employment in Hydrophobia has been followed with but transient benefit, I am aware, but I have yet to learn that it has had a fair trial, from it I should anticipate every thing we could desire namely quietness of the nervous system until the crisis should occur, and the patient awake to a new existence, for I think with Dr. Good we may be hoping for a crisis though a yet one has scarcely ever presented, but by the sedative action of Opium benevolence with its consequent anxious prostration and intemperate debility. With respect to the benefits already derived from the use of Chloroform in this disease they may be charged with the others as but transient. But instead of its occasional use we must employ its continuous inhalation the latter I could not expect to be available in the later periods of the disease for them the Opious secretion of saliva is enormous not only from the mouth but from the numerous openings of the air tine, even requiring a repeated elevation of saliva would absolutely contraindicate its use.
item for with these condition we could expect nothing
less than suffocation, it to we might employ it in the
aforementioned manner in the earlier stage of the decided
symptoms and in the secretion of salivary has become to
exhaustive and tormenting to the patience its inhalation
could be suspended on the occurrence of any serious
symptoms from its use. The date of the disease how-
however when I think its employment might be most advanta-
gious is during the premonitory symptoms, commencing on
the cessation of well marked cases and continuing for any
period with a hope of putting off the more dreaded accession
of true hydrophobic symptoms, with the accompanying
consequences, allowing the patient to wake up seldom
and for nourishment alone. I think we might look
forward to the treatment with some hope of success
and of allowing the nervous system to recover itself during
the period of dormant anaesthetic existence in which the
increased action of the nervous system is allayed while the
vegetative action of separation and nutrition proceeds.

Koonalbo Bridge. The Woolarca. This prison, a drably
enclosure, with which the Indians of Guiana near the points
of low areas (formed of numerous Inhabitants among
them occurs an undetermined species of strychnia obtained
by making an extract from the bark) and first proposed.
by Professor Sewell of the London Veterinary College as a

with the use of artificial inspiration

cure for hydrophobia. It was examined and detailed by Sir J. Brodie from which it appears a deadly venom

instaneously suspending consciousness, voluntary action,

and respiration acting directly on the functions of the brain.

It was prepared in a pretty large quantity by Charles

Mallon, by the enterprising traveller at some trouble and

risk from the native tribes. It was chiefly prepared and has been advanced both by

himself and Dr. St. Helier of London as a last resource in hydrophobia. From communications received from

them I am satisfied I learn that several hundred applications

have been made to them for aid in expectation of

the disease, or on its accession. It has never appeared as

the application has been too late to allow them catching

the patient as death occurred. It is also proposed to

use this poison as a remedy in hydrophobia victims with the

end of artificial respiration. In two experiments on

animals affected with that disorder it was employed

and they under the use of artificial inspiration recovered

free from the disease. With regard to regarding this

experiment on the human subject by introduction of the

poison by a perforation or injection into the brain I find no

reference to it in works touching on the treatment of the

hydrophobia. It is as the professor then any great
anxiety to test its effects on their fellow creatures, why I cannot deny it surely would not injure the patient though he returned to conscious ness still hydrophobic, and would be of material benefit to after-generation should the attempt prove successful. Certainly it is almost worse than useless to administer the ordinary remedies and in the usual manner for none of them have yet proved effectual and every effort to swallow the drug brings on a recurrence of the much dreaded and terrific opusm.

In the lower animals no great benefit has yet accrued from the treatment of the decided symptoms in these poor things, for you will believe in the good effects of prophylactic treatment in the Chag, by medicines during the stage of incubation, I have been informed that the Wowashi has been but without success used on the lower animals affected with the hydrophobia, but I can find no correct date. Surely if it has not it should be attempted on them.

Tome Smith Hewitt