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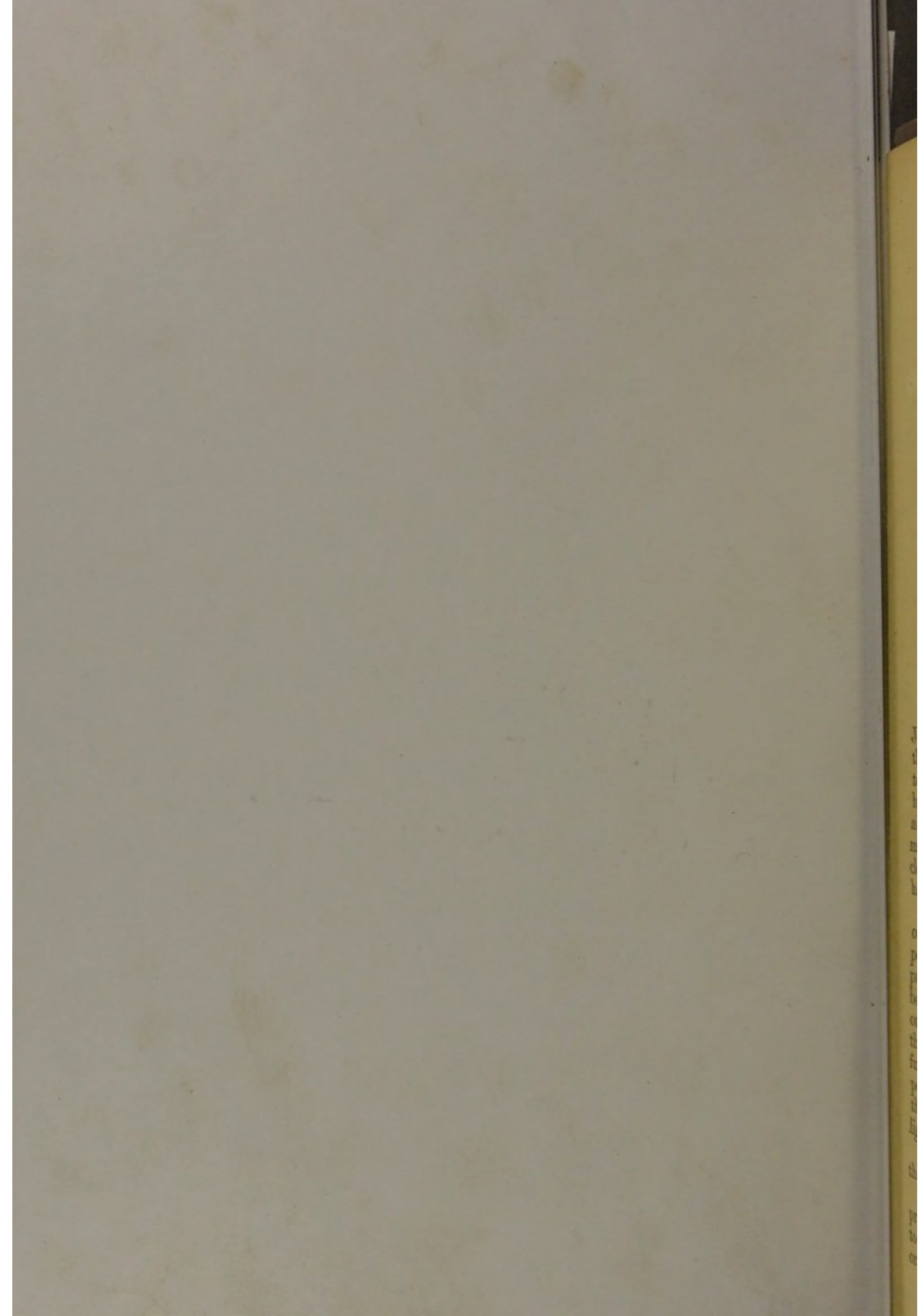
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CASE OF HYDROPHOBIA.

BY

JAMES STRUTHERS, M.D.,
LEITH.

[FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, FOR JANUARY 1851.]

JOHN WESTON, æt. $8\frac{1}{2}$, was bitten, on the 13th October 1850, in the right eyebrow by a middle-sized dog. The animal was supposed to be mad, and was immediately killed. I saw the boy within an hour and a-half after the accident. There were two wounds, one above the eyebrow, an inch in length, and lacerated; the other immediately below the eyebrow, half an inch in length, and with a clean margin. Hemorrhage had ceased for some time, and the parts had been carefully washed.

There being reason to believe that the dog was mad at the time of the accident, I resolved to destroy the bitten parts as speedily as possible. The patient being much frightened and very unruly, was put under the influence of chloroform, without which it would have been impossible to have cauterised the parts satisfactorily, and without risk of injuring the eye. The two wounds were laid into one, the lacerated parts excised, and the whole of the raw surface carefully cauterised, first with the nitrate of silver, and then with the pernitrate of mercury; while the latter was being applied, one of the branches of the supra-orbital artery bled freely, and required a ligature.

The wound went on satisfactorily, and presented, at the end of the third week, a healthy cicatrix, with scarcely any deformity.

Nothing unusual had been observed in the behaviour of the dog previous to the day of the accident. In the morning he was noticed to be dull and restless, but took some food, and was observed once or twice in the course of the day lapping water in the usual way.

In the afternoon he was observed rolling on the grass as if in agony, uttering at the same time a kind of suppressed bark or howl. It was at this time that the boy approached to caress him, when he sprang up and bit him in the eyebrow. Shortly before this the owner of the animal had given him some water containing nitre, which seemed to choke him, and caused vomiting.

The dog having been killed immediately after the accident, I was prevented from making any observations on his condition. There was nothing unusual, however, in the appearance of the body. The mouth contained some blood, but was free from froth, or fluid of any kind. On the following day I made a *post-mortem* examination of the body of the dog. The mouth, tongue, and pharynx presented nothing abnormal. The trachea and larynx were nearly filled by a rather firm clot of dark blood, which, as it did not extend into the bronchi, was supposed to have been extravasated at the time the animal was killed. The mucous membrane of the trachea and bronchi was much redder than natural; and there was some frothy fluid in the bronchi. The lungs contained much dark blood, and presented several spots of ecchymosis on their surface. The heart was normal, and the large veins near it were distended with dark blood. The œsophagus was natural. The stomach was the size of an orange, contained some air, and about three ounces of a dirty greenish coloured fluid, in which were two blades of grass, and some dirty stringy mucus. The other abdominal viscera were normal; the bladder strongly contracted, and quite empty.

On the 15th November, thirty-two days after the accident, I was called at two in the morning to see the boy, who, I was informed, had been complaining for about two days. I found him sitting in bed in his father's arms. He was restless and fidgety, never keeping the same posture for a minute at a time. His look was quite peculiar, and expressive of profound dread. His eyes were full and clear, and much more intelligent looking than usual. On being asked what was the matter, he said he felt pain in the wound, in the eye, and all over the same side of the head. The cicatrix was pale and natural in appearance. He answered questions rationally, and without any appearance of fear; put out his tongue when desired to do so; and gave me his hand to feel the pulse, which was 112, rather weak, and remarkably irregular. While holding his hand I blew suddenly on his face, when he sprang, convulsed, to the other end of the bed; covered himself with the clothes; shook, and cried very much; and beseeched me not to breathe upon him any more. This established the diagnosis.

I then learned the following facts—namely, that he had continued quite well up to the 13th November, his friends taking care not to irritate him in any way, or to make any allusion to the dog. On the evening of the 13th, exactly a month after he had been bitten, he and some companions were out amusing themselves, when they were frightened by some one playing the ghost, and ran home. He

refused to go out again, saying he was frightened. Immediately after this, on the ghost being mentioned, he began screaming and crying, complained of pain in the wound, in the eye, head, back, legs, and arms. He maintained also that his little fingers were bent and stiff, although his parents could not observe anything unusual. When any one happened to breathe upon him, he told them he did not like it, and to keep away from him. The same evening he took his supper, consisting of porridge and milk, in his usual manner, and without making any complaint. He slept but little during the night, was restless, and tossed about a good deal. Next morning he had some coffee for breakfast, but took only one mouthful, saying it would not go down. He tried water and milk, but with the same result. In the afternoon he ate a little biscuit, and took some milk, which he swallowed without difficulty. In the evening he asked for a potato, snatched it from his sister, took a bite of it hurriedly, and then pushed it away. He was restless during this, the second, evening, and became more so towards morning, when I saw him for the first time since the seizure.

His state then was as formerly described. When asked if he would have some water or milk, he refused at first, but afterwards offered to take either. He put a cupful of milk to his mouth, but immediately pushed it away in an agitated manner, and buried himself in the bed-clothes. He was then offered some jelly, of which he readily took two or three spoonfuls, but in an agitated manner, and as if in a great hurry. He then had a bit of soft biscuit, which he ate calmly; when swallowing it he was ordered to hold up his head, when the act of deglutition was observed to be performed deliberately, and without any spasm or hurry. When asked if he had pain in the throat, he said "Yes," and pointed to the larynx. The tongue was clean, steady, and moist; there was no unusual amount of fluid in the mouth, and nothing like slaver on the lips. The breathing was calm, regular, and without noise. He was desired to get out of bed and to walk to the fire, which he did barefoot, on the cold floor, and without any agitation, and commenced warming himself. He was then offered a cup of cold water, of which he readily took a mouthful, but instantly drove away the cup, and ran into a corner, seemingly suffering from pain and spasm in the throat. The water was then warmed to blood-heat, when, after some pressing, he took another mouthful, which affected him in a similar manner, but not so severely. The temperature of the surface was natural, and there was no sensible perspiration. He could bear the legs, arms, and trunk to be handled and breathed upon without showing any uneasiness, but not so the face. He could also bear the head and spine to be tapped strongly, complaining only of slight tenderness from the head down to the middle of the back. A bright light presented suddenly caused slight agitation, but was soon borne with ease. The pupils were moderately dilated, and acted readily and equally. On being asked if he was afraid of anything, he hesitated, and would

not answer me, but whispered to his mother that he was afraid of the ghost; and on being again asked, he told his father that he was afraid of the dog. He was now ordered ℥ii. tincture of cannabis, with ℥iij. of laudanum, of which he was to have half a teaspoonful every half hour.

At 8 A.M. his condition was much the same; he ate some biscuit and drank some milk during visit.

At 3 P.M. he was much worse. He could not remain quiet for a single instant. There was great general agitation, with constant spasmodic movement and jerking of the limbs; and every two or three minutes there occurred a fit of general convulsions, commencing about the throat, during which the countenance was distorted, and had a wild and savage expression. These fits occurred sometimes without any apparent cause, but were most frequently induced by his attempting to take anything in his hands, or attempting to swallow, or when he was breathed upon. There was now a profuse flow of frothy fluid from the mouth, accompanied by constant hawking, and spasmodic working of the pharynx, with occasional retching and frequent belching of wind. The fluid was partly spat out and partly ran over the lips, whence it was constantly wiped away by the patient. He frequently asked for water, milk, and meat, and did not seem to have any dread of fluids except when he was pressed to take them, or when he attempted to swallow them. When offered any fluid in a cup, he would not take it, but would ask for a spoon, dip it into the cup, hold it for some time in front of him, make repeated and convulsive efforts to bring it to the mouth; then, with a look of great resolution, dash the spoon into the mouth, and throw it away. This was invariably followed by frightful convulsions of the whole body, which generally terminated by the belching of large quantities of wind. Once or twice he had spasmodic rigidity of the arms and hands, more especially of the right, and complained much of pain in the little fingers, experiencing great relief when they were squeezed. He was perfectly sensible, knew and named those around him, and answered questions rationally, but generally in monosyllables, and spasmodically, owing to the severity of the convulsions. He never showed the least inclination to bite or to hurt those around him. There seemed to be constant change of purpose and of thought. The senses of hearing, sight, and smell were preternaturally acute, though he once or twice said he could not see. It was impossible to deceive him in any way.

At half-past 6 P.M. Dr Christison saw him with me. He was then weaker, and presented the same symptoms as in the afternoon, but in a less marked degree. The pulse was scarcely perceptible. He ate a piece of biscuit and took a mouthful of tea, which was followed by severe convulsive efforts to swallow, and by convulsions of the whole body. He was ordered to have a suppository, containing half a grain of the muriate of morphia, to be followed in half an hour by another containing a whole grain.

At half-past 8 P.M. he was much weaker; had become a little quieter after the second suppository; and was said to have vomited some blood. He was seen at this time by Drs Coldstream, Keiller, W. T. Gairdner, and J. A. Sidey. The pulse was all but gone at the wrist; he had still fits of convulsions, but much less severe than during the day. He was evidently sinking fast. He continued much in the same state till half-past 9 P.M., when he expired calmly, having been nearly free from convulsions for the last quarter of an hour, and apparently quite sensible. Death took place thirty-three days after the accident, and fifty hours after the first symptoms had shown themselves.

Sectio-Cadaveris.

The body was examined 36 hours after death, by Dr W. T. Gairdner and Mr John Struthers, in presence of Dr Keiller and myself.

External Appearances.—There was slight lividity of the general surface; and the posterior part of the body presented the usual post-mortem discoloration. There was a copious escape of whitish foam from the mouth and nose, that from the latter was slightly reddened. The *rigor mortis* was almost absent, except in the fingers and legs, where it was slight. The cicatrix on the right eyebrow was healthy in appearance. The eyes were clear and lustrous, the pupils moderately dilated, the left one oval and larger than the right.

Head.—Integuments rather exsanguine; superficial vessels of brain moderately congested. About half a drachm of clear fluid in each lateral ventricle, and very little at the base of the brain; the membranes healthy. The cerebral substance, both white and gray, very slightly and uniformly softer than usual. The vertebral and basilar arteries had a dark greenish appearance. The superficial vessels of the cerebellum and medulla oblongata were generally and pretty fully congested; the gray matter of the cerebellum rather deeper in colour than natural.

The cranial nerves were carefully examined, more especially the pneumogastric, both where it leaves the medulla oblongata, and at its place of origin in the floor of the fourth ventricle, but without detecting anything unusual.

Spinal Cord.—The dura mater normal. The pia mater in the dorsal and lumbar regions more congested than in the cervical, but not more so than usual. The same slight general softness which was observed in the brain existed in the cord, but to a less extent, more especially at its upper part. The medulla oblongata was normal, and firmer than any part of the cord.

Chest.—A considerable quantity of blood had escaped from the body when the head was examined, and before opening the thorax. There was no fluid in the pleuræ. Both lungs presented at the posterior part a few spots of sub-pleural ecchymosis, and at the lower and anterior borders a few ridges of interlobular emphysema. Numerous lobules were observed of a darker colour than the others, well defined, and depressed slightly below the general surface. About

two drachms of clear fluid were found in the pericardium. The visceral pericardium presented several small spots of ecchymosis. The right ventricle and auricle contained two or three half decolorised clots, and a considerable quantity of frothy fluid blood. The left ventricle and auricle were well contracted, contained a little blood, but not the slightest froth.

The *Tongue, Pharynx, and Œsophagus* were perfectly natural, the mucous membrane presenting its usual pale colour. The aryteno-epiglottidean folds, and the mucous membrane for half an inch below them, posteriorly, were of a faint rose-red colour, but not deeper than natural.

The *Sublingual Glands* were natural; the other salivary glands were not examined.

The *Trachea* was coated throughout with a sanguinolent froth. The mucous membrane of the epiglottis and larynx was natural; that of the trachea was of a rosy hue, and minutely injected, the redness, commencing about half an inch below the cricoid cartilage, and becoming deeper towards the bronchi. The bronchi contained much frothy mucus; their mucous membrane was of a deeper red than that of the trachea. The pneumogastric nerve was carefully examined on both sides of the neck, and was found perfectly natural.

Abdomen.—The stomach contained about half a pint of dirty greenish coloured fluid. The mucous membrane in the posterior surface presented a considerable amount of finely arborescent injection, with some ecchymosis. The other abdominal viscera presented nothing unusual.

Remarks.—This is the third case of hydrophobia that has occurred in this neighbourhood within the last twelve months. The first of these occurred at Dalkeith, an account of which will be found in the report of the proceedings of the Medico-Chirurgical Society for last year; the second in Edinburgh, and was published by Dr Sidey in the last number of this Journal. The present case I consider worthy of being recorded, its history being complete, and a careful post-mortem examination having been made.

The state of the dog at the time of the accident, as described by those who saw him, was certainly such as to lead to the belief that he was mad. He was apparently suffering severely; and his bark was of that character which is considered pathognomonic of true rabies in the Dog. The animal also had been previously familiar with the boy, and bit him without any provocation.

The bite was in an unfavourable situation, the part being uncovered, and very vascular. The chances of inoculation taking place were thus rendered greater than if the bite had been given on a part covered with clothes, by which the teeth would have been wiped in passing. The most unfavourable view of the case having been taken at the time, the whole of the surface through which absorption might take place was immediately and thoroughly destroyed; and although

an hour and a-half had elapsed, and the wound had ceased for some time to bleed, I entertained good hopes that the parts had been destroyed in time to prevent absorption of the virus. I gave, however, a guarded prognosis to the parents, and cautioned them against irritating the boy, or referring to the dog in his presence.

The examination of the body of the dog did not tend to remove the suspicion as to his having been mad. The appearances met with were those most frequently found in cases of hydrophobia, but they might have been caused by other diseases. The result of the case, however, puts it beyond all doubt that the dog must have been mad at the time of the accident; the symptoms of the disease were too well-marked to leave the slightest doubt as to the case being one of true hydrophobia, or canine rabies.

A fact incontestably established by this case is, that absorption may take place within an hour and a-half; and I think it not improbable that, in similar cases, unless the parts be thoroughly destroyed before bleeding has ceased, we can have no security that absorption has not already taken place to an extent sufficient to induce the disease. The period of incubation was here thirty days, which is rather under the average. It is doubtful whether the fright the boy received had any influence in accelerating the appearance of the symptoms; no doubt the affection would have shown itself independent of this; but in a disease where the susceptibility of the nervous system is so intense, any shock must have a hurtful effect, and may give the first impulse to the development of the symptoms. The convulsions in this case were very severe during the last ten hours; they were strongest in the muscles of respiration, and in those of deglutition, which at first were the only ones affected. They resembled those of epilepsy, the efforts at expiration being strong, frequent, and ineffectual, while the face and neck were much congested.

The post-mortem appearances were such as could only be considered as secondary consequences of the disease. Those met with in the lungs, bronchi, and trachea,—viz., congestion, ecchymosis, and emphysema, are those most constantly found both in man and animals that have died of the disease, and correspond in frequency to one of the most constant of all the symptoms,—viz., convulsions of the muscles of respiration, to which they may fairly be attributed. The existence of frothy mucus in the trachea and bronchi after death, and the circumstance that the flow of frothy fluid from the mouth, commenced only after the convulsions had become severe and constant, would seem to point to the lungs and air passages as the source of that fluid—the *bave*—which collects in the pharynx and back of the mouth, and is hawked up by the patient; and in which, and not in the saliva, the virus has been found most active. There was no cough throughout the whole course of the disease, the only approach to it being short and continued hawking. Inflammation or congestion of the pharynx and œsophagus, which has been noticed in some cases, was entirely absent, the mucous membrane being quite natural and

free from any unusual moisture. The most uncommon appearance met with was the frothy state of the blood in the right cavities of the heart. This has been noticed by two observers only—Morgagni and Trollet, the latter of whom found it present in three out of six cases, and in some of these it existed in the left as well as in the right side of the heart.

The nervous centres and roots of the nerves have in some cases been found much congested or inflamed; but here there was absolutely nothing which could indicate that the disease was other than a purely functional affection of the nervous system. The eighth pair of nerves, which some have supposed to be specially concerned in this disease, were carefully examined in the neck and at their origin, along with all the parts of the medulla oblongata; and all of us present at the post-mortem examination, being familiar with the appearance of these parts, were unanimously of opinion that we had never seen them with less appearance of disease.

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