

truth. They must, however, in some measure be left to speak for themselves. All but one of the cases had undergone more or less prolonged treatment before they came under my notice. In all, the *head* of the worm was obtained. In eighteen instances I personally searched for and found the *head*. Two of the patients had each two tapeworms. From one of them I secured both *heads* at the same time. My cabinet of specimens has thus been enriched by nineteen tapeworm-heads taken from eighteen of the above-mentioned patients. I believe this experience to be altogether unique. That matters little; but I have the solid satisfaction of knowing that I have been the means of sparing many a fellow-creature from the burden of symptoms that were operating to render his or her life almost unendurable.

Harley-street.

HYDROPHOBIA AND RABIES.

By HENRY MUSCROFT, M.D.

THE cases of hydrophobia which were inserted in THE LANCET of October 10th having been the means of eliciting from Mr. Fleming an expression of doubt as to their true nature, or at least as to the disease having been caused in each case by the bite of a healthy dog, I venture to think that the following further confirmatory particulars may change Mr. Fleming's opinion, and, doubtless, will prove of interest to those readers of THE LANCET whose attention has latterly been so much given to the subject of hydrophobia.

With reference to the case that came under my observation, I may say that my own preconceived notions were entirely opposed to the possibility of hydrophobia being produced by the bite of a non-rabid animal; but to oppose the inexorable logic of facts, and to ignore the opinions of those medical gentlemen who saw the patient during life, and of others who were present at the post-mortem examination, would have amounted on my part, I will not say to prudence or to caution, but to obstinacy. Mr. Fleming says that the man made no reference to the cause of his disease. The poor fellow, perhaps, was not absolutely assured that his disease was hydrophobia, or that the dog that had bitten him was rabid; but he must have had some fears as to the true nature of the disease he was suffering from, as on the day of his death he gave orders for the dog to be destroyed. But what the man *thought* has little to do with the history of the case. On the Monday preceding his death he went to Wakefield by train, accompanied by his wife; and she informs me that, whilst they were in the train, he told her that he felt very ill, and that he had pain in the wrist, and that the pain extended up the arm. The next link in the chain of evidence, and perhaps, indeed, it should, in the order of the occurrence of events, have been mentioned before, is that of the man who was present at the time of the infliction of the wound by the dog. The accident occurred in this manner:—About six weeks before his death, the man who was doomed to be the subject of hydrophobia, having left his friend in charge of the dog, held up a handkerchief at a distance, and at an appointed signal the dog rushed towards his master, and, springing up to seize the handkerchief, grazed the poor fellow's wrist, which bled at once, the blood on the wrist being seen by the witness above referred to. This evidence should be conclusive, including as it does that of the man who saw the wound inflicted and of the unfortunate man's wife, to whom the latter first complained of the pain in the wrist and arm.

In the other case, which, although sent to THE LANCET by me, was reported by Dr. Ginders, Mr. Fleming thinks that the poor man might have been inoculated by another dog, or that a mistake may have been made as to the dog produced at the inquest. I fear that, if, instead of accepting facts as they are, doubts and difficulties are raised, and attempted explanations and apologies are offered for every case not obeying the rules and dictates of preconceived theories, little advance will be made in the etiology of hydrophobia. If a man had been bitten previously, he surely would be likely to remember something of the circumstance. He certainly would if he had been bitten by a

dog recognised as rabid, the fact itself being sufficiently important to be a decided aid to memory. But if the bite had been so slight or unimportant as to be forgotten, such forgetfulness at least is suggestive that the bite was caused by a dog showing no signs of illness; and this is confirmation rather than refutation of the position I have assumed. It certainly would be most unjustifiable and reprehensible to create an unnecessary fear as regards ordinary dog-bites, especially when it is remembered—and what indeed ought always to be inculcated on persons who are the subjects of such accidents—how few of those bitten by rabid dogs become the victims of hydrophobia, and how fractionally small such proportion is when proper preventive remedies are adopted; but it would be still more unjustifiable and reprehensible to encourage a perfunctory and careless treatment of an injury, however trivial, by withholding facts which prove the necessity of practitioners treating all dog-bites as poisoned wounds, however slight they may be, even though they consist of little more than abrasions.

The case reported by Surgeon-General Maclean, C.B., in THE LANCET of Nov. 7th, of the medical man of the Bombay Medical Service who was bitten by a wild dog of the Deccan, is so far corroborative of the cases I have reported that, apparently, there was not the slightest suspicion of the dog being rabid up to the moment of its having bitten its master. It is unfortunate in this case, as in many others, that the dog was destroyed without allowing the opportunity for actual discovery or proof of its being the subject of rabies; and in this manner I venture to think that, more frequently than at present believed, there have been cases of hydrophobia the result of the bites of animals not rabid, and that the immunity of these dogs from this disease would have been eventually proved if the order for their destruction had not gone forth immediately after the infliction of the bite.

The position that I assumed in my last communication was, that although the saliva of a rabid dog is much more dangerous, that of some dogs not rabid is not free from danger when, from idiosyncrasy or from the existence of some *materies morbi* in the individual bitten, there is predisposition to the development of hydrophobia. I do not think that this has been successfully controverted. By parity of reasoning, I would also suggest that, in those peculiar cases of rabies where the disease appears to have arisen spontaneously and not by contagion—where, in fact, all evidence is opposed to the animal affected having been bitten by a rabid dog, the disease has arisen by the saliva of a dog, healthy as far as exemption from rabies is concerned, being brought in contact with a wound or abraded surface whilst the two dogs have been playing or fighting. For the production of rabies in the dog, as of hydrophobia in man, in the exceptional cases to which I refer, the chief factor doubtless would be predisposition to the development of the specific disease by some favouring, and at present unrecognisable, idiosyncrasy.

In corroboration of these views, I must be allowed to give extracts from an article on the subject of Saliva in vol. xxiii. of the "British and Foreign Medical Review" for 1847, and which has been kindly brought to my notice by my friend, Mr. Wheelhouse, of Leeds. This article incontestably proves that, whatever may be the case in the human subject, the saliva of a healthy dog is capable of producing rabies when injected into the veins of another dog; and this fact, once acknowledged, suggests not only an explanation of the apparently spontaneous origin of rabies at times, in the manner I have indicated, but also inferentially what might be expected when a human being is bitten, who, from peculiarity of temperament, or other unhealthy and perhaps temporary disadvantage, is predisposed to take on unhealthy action. The article on Saliva is by S. Wright, M.D., and consists of extracts taken from THE LANCET, to which journal the papers had been originally contributed, and which were so highly appreciated at the time, that they were translated into the German and Dutch languages, and having thus appeared, the reviewer of this subject in the "British and Foreign Medical Review" wisely preferred, as he said, the original diction as given in THE LANCET, instead of retranslating the volumes before him. The experiments referred to have such a bearing upon the present question that, although they appeared in THE LANCET nearly thirty years ago, I feel assured that the reappearance of one or two experiments selected by the reviewer, not as

peculiar or exceptional results, but as types of the fourteen experiments recorded in THE LANCET, will be interesting to those who have never seen an account of these results, and who may not now have an opportunity of referring to them.

"Four drachms of slightly alkaline saliva, sp. gr. 1010, were injected into the right external jugular of an old mongrel dog, and at intervals of several minutes the injection of a similar quantity was repeated, until two ounces had been injected." For the purposes of this paper, it is scarcely necessary to refer to the immediate result upon the nervous and circulatory centres by these injections. The effects were most severe, and the phenomena produced were not unlike what might be expected after the exhibition of a poisonous dose of some powerful drug. "After three or four days the dog appeared quite recovered, and it was not until the sixteenth day succeeding the experiment that symptoms of rabies showed themselves, the dog having been ailing the day before. On the day mentioned, the dog growled and snapped at everything, living and lifeless, that approached him. My assistant in alarm ran away, and the other attendants being terrified at the dog's madness, deserted me also, and I was consequently left to manage him alone. By unobservedly seizing him at the back of the neck with one hand, and grasping him tightly, I was enabled to raise his lips with the other, when I observed that his mouth was filled with foam, and that his gums and cheeks were much swollen and inflamed; his nose was very dry and hot; paws cold and tender; respiration interrupted with frequent sighing; pulse 106. So long as I held him in my grasp, he seemed to be quite docile and contented, but the moment I loosed my hold, he ran furiously at me, and but for a strong chain which secured him to the wall, I have no doubt I should have suffered from his bites. In a few hours the froth began to distil from his mouth; he was tortured with thirst, and lapped water eagerly, and without dread; indeed he plunged his mouth and face into the cold liquid, as if to relieve the heat and inflammation which troubled him; with the same intention he licked the cold wall and floor, but he would not touch any warm body, nor would he lap tepid water. He was remarkably irritable and restless, and when not snapping at objects that approached him, was constantly turning about, or chewing the sand and straw that were near. He was seen in the afternoon of this day by Mr. Bowker, surgeon, and by several other scientific friends, all of whom were decidedly of opinion that he was the subject of madness. In the evening his restlessness somewhat abated, and he lay moaning in a husky voice, occasionally altering the position of his head, as if anxious to sleep. Thirst and salivation were diminished; eye dull and glassy; pulse 64; nose dry; extremities cold. He continued in this state, with increasing weakness and somnolency, until about five o'clock on the following morning, when, after a few struggles and signs of suffocation, he died."

In the second typical experiment, "six drachms of neutral saliva, sp. gr. 1008, were introduced at three separate injections into the right common carotid of a dog. Each injection was followed by an extraordinary increase in the heart's action, hurried irregular respiration, and general convulsion. At the end of six hours slight coma supervened, respiration was deep and stertorous, heart's action slow and laboured, sensibility very diminished. As in the preceding experiment, the dog recovered apparently in a few days, but on the morning of the eighth day, on being visited with his breakfast, he flew at the servant, who narrowly escaped him. He frothed considerably at the mouth, and appeared fierce in the eyes, which were deeply reddened. He wandered about incessantly, chewing sand or straw or lapping a little water, but he refused all kinds of solid food. After having gnawed an opening large enough in the door of the place where he was confined, he escaped, and was pursued by half-a-dozen men, who were in trepidation from the manifest signs of madness which the dog exhibited. He snapped furiously at everything that approached him, and would occasionally pursue one of his opponents, until tired by the effort, he was compelled to stop for breath. When I saw him in this state he was staring wildly, and a quantity of frothy saliva was distilling from his mouth. I put a strong glove upon my right hand, and whilst the dog was engaged in snapping at a stick held before him, I caught him by the back of the neck. On the following morning he was much in the same state, but less inclined to bite; his mouth was

still very frothy, and his eyes deeply reddened. The irritability and restlessness increased towards evening; he would allow nothing to approach him without snapping at it; he was constantly engaged in licking the cold wall, or chewing straw, sand, or coal, or dragging himself upon his belly over the rough ground. On the tenth day he was improved, and the signs of madness diminished. He lived some weeks afterwards, and the nose and ear having sloughed away previously, he eventually died from the effect of gangrene of the extremities."

To determine whether the mere animal matter of the saliva had any share in producing the above phenomena, Dr. Wright performed the following experiments:—

"I injected a drachm of isinglass dissolved in two ounces of water into the carotid artery; a little temporary excitement was the consequence, but the animal suffered no further inconvenience. I injected a drachm of pure mucus, diffused through an ounce and a half of water, into the jugular vein; the heart was a little quickened, and respiration was correspondently hurried, but the effects completely subsided in twenty minutes. I injected the entire white of an egg, diffused through two ounces of water, into the left common carotid artery of a dog. It produced considerable cerebral excitement, which was succeeded by drowsiness and feebleness of the limbs that continued for several hours; but the symptoms were very mild, and their duration inconsiderable."

The experiments now recorded, although not actual proof of the action of saliva produced by absorption after dog-bite, at least *prima facie* are strongly suggestive of what would be likely to be the result where the individuals or dogs bitten are the subjects of some idiosyncrasy or peculiarity, and the deductions arrived at in my previous communication advanced no further than is contained in this proposition.

The facts now brought to the notice of the readers of THE LANCET may not have been seen by Mr. Fleming, and if such be the case, they will be as interesting to him as I feel assured they will be to those to whom the etiology of hydrophobia has latterly been a frequent subject of thought and discussion.

Pontefract.

CASE OF AMPUTATION DURING ACUTE MANIA.

By G. B. FERGUSON, M.A., M.B. OXON.,
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DAVID H—, aged forty-nine, a shoemaker of Tewkesbury, was admitted into the Cheltenham Hospital on the 16th of March, 1874, with the lower half of the right leg badly crushed and the foot torn off, as the result of being run over by a railway train. Amputation at the lowest practicable point, about three inches below the knee, was performed by skin flaps and circular division of muscles. The arteries were twisted; dressings of carbolic oil were used, and the stump supported on a back splint, the whole being covered with cotton-wool; a tent of lint was left for drainage, which last was carefully attended to throughout. The patient was in a state of acute mania at the time of the operation. Occasional symptoms of mental strangeness had been apparent for some little time before, but the acute attack dated from the time of the accident. This was probably occasioned by his having taken too much to drink in Cheltenham on the previous day, and having wandered on to, and fallen asleep on, the Midland Railway.

For fully a fortnight he required watching night and day, talking nonsense, gazing fixedly on all who approached him, pulling off his dressings, struggling and attempting to get out of bed; and all this without any of the terror, manner, or optical illusions of a delirium tremens patient. He took his food well throughout, consuming his pint of beer with satisfaction, but refusing more. His settled delusion was that he had committed various mortal crimes for which he was presently to be tried and hung, his constant request being that the trial should be dispensed with, but that the sentence, hanging or beheading, should be forthwith executed. He was rather uneasy about his spiritual welfare, but seemed