an alarming sense of suffocation in such cases, by increasing the general circulation at a time, when the lungs are not in a condition to transmit the blood as fast as it is sent to them by the right side of the heart. The hot-bath is also objectionable where the vascular action of the brain is in a state of great excitement. The *semi-cupium*, *pediluvium*, and *fomentations*, are all to be considered as partial applications of the *hot-bath*, and admit of the same general observations being made with regard to them.

The sudden and intense application of cold to the skin, as by the *cold bath*, or *cold affusion*, produces a great and universal effect on the system, as is evident by an examination of the different functions. It is an agent therefore well calculated to influence diseased action by *counter-irritation*. It has not, however, been employed to any great extent, from a dread of its use. We are so accustomed to attribute inflammation to cold, as its cause, that it is difficult at first to consider it in the light of a remedy. We have, however, sufficient proofs of its power to check the course of ordinary fever in many instances: and it has been occasionally employed in *enteritis*; not so much, however, with the intention of directly relieving the inflammation as to overcome the constipation generally present in these cases. But we are in want of facts upon this subject.

Stimulating the skin in various ways, as by friction, irritating applications, and exciting inflammation artificially, by *cantharides* and the like, comes under the head of *counter-irritation*. These are to be reckoned rather among the secondary or auxiliary means of cure, than as principals, though they are sometimes sufficient for the removal of slight and chronic inflammations. If, as there is reason to believe, it is the inflammation excited by blistering, and not any discharge occasioned by it, that is the source of the benefit derived, one sees no ground for the preference so generally given to *cantharides* for the purpose; for inflammation of the skin may be much more quickly produced by the mustard-poultice, and also by ammonia in a liquid form, than by the application of blisters; which, by the general irritation they often occasion, amounting sometimes to delirium, and still more by the inflammation they are so apt to excite in the urinary passages, are liable to great objection, and often wholly inadmissible. What particular preference is due to the *erysipelatous* inflammation excited by blistering, in comparison with the

pustular inflammation produced by *tartarised antimony*, is far from being satisfactorily ascertained. The *counter-irritation* produced by *issues* and *setons*, is adapted to the *chronic*, rather than the *acute* forms of inflammation.

I may observe respecting *blisters*, that they are not well adapted to the early stage of violent inflammation, while the general vascular action is in great excess. In such cases, they tend rather to aggravate than to mitigate the disease, as well as to disturb in a high degree the general system.

SELECTIONS

FROM

LECTURES DELIVERED

IN THE

*Theatre of the Royal College of Surgeons
in Ireland.*

By MR. COLLES.

On Tetanus.

Gentlemen,

ANOTHER consequence of wounds, is the disease commonly called lock-jaw, we shall hereafter examine, whether it ought to be considered a spasmodic affection or not. It supervenes to every variety of wound; I have seen it occur when the cuticle under the eye was merely raised by the lash of a whip; I have also seen it follow amputation, and succeed to a contusion of the leg, over which the wheel of a car had passed. Lacerations, however, and wounds of tendinous parts, are more likely to produce it than any other species of injury. It is, indeed, impossible to say, in what case it will not occur, and if it should come on after an operation, we should, in justice to each other, look on it as an unfortunate accident which cannot be guarded against. Every period of life is equally susceptible of this disease; but there are three periods after the receipt of a wound, when it usually appears. The first is when the symptoms set in immediately after the infliction of the injury, and the patient is destroyed in twenty-four hours. If, after

twenty years' practice you meet a case of this description, it will be as much as you may expect. The second, is when it appears in the interval between the commencement of suppuration and the process of healing being completed; and the third, when it occurs, as some authors have stated, after the wounded parts are entirely cicatrized. I have known instances even of this kind to have taken place. Tetanus has been divided into two species:—the idiopathic, when it comes on without any cause that we are able to discover; and the symptomatic, when produced by wounds. Nosologists who have written upon the subject, call that form of the disease in which the jaws alone are affected, trismus; and the other, tetanus, when the whole system is engaged. The terms, *emprostotonos*, and *opisthotonos* have been also employed to describe two states or symptoms of this disease: the first is applied when, by the action of the muscles, the body is drawn forward; the second, when drawn backward. Now with respect to the first of these terms, I never saw a case of tetanus to which it was applicable, except that of an old man who, from some cause or other, preferred sitting up in his bed, but a spasm never threw him more forward than his usual position. The disease generally commences with a soreness of the throat, and we are told by some, that if, at this time, we examine the patient's legs during sleep, they will be found very much extended. A surgeon conversant with the disease will be able to detect it at a very early period of its progress, from the peculiar cast of countenance which accompanies it, and may be the first to call the patient's attention to his state, before he is aware of it himself. The expression of countenance in this disease is very peculiar, the forehead is wrinkled, the nostrils more or less dilated, and the angles of the mouth somewhat depressed. When we come to examine the fauces, we find nothing wrong there, nor do the muscles of the neck at this time perhaps feel hard to the touch, but in some time after, if you apply your fingers to them, they will be found tense and rigid. At this stage of the disease, the patient feels no serious inconvenience, but if asked to drink, though he may be desirous to comply, he is prevented by convulsions. Shortly after, the rigidity extends from the neck to the muscles of the trunk and abdomen, and ultimately seizes on the upper and lower extremities. It is a curious fact, that the fingers are the last members which are deprived of motion in this disease. During its whole course

there is not the slightest relaxation of the muscles; they are in one continued state of spasm until the patient dies, or has a remission of his symptoms altogether. If he attempts only to speak or drink, he is instantly seized with a paroxysm, and in the later stages of the disease these spasmodic fits will come on without any effort being made to produce them. From being pale, the patient's countenance becomes turgid, and of a livid hue; his breathing is so disturbed, that you would really think, that he would every moment expire of suffocation; and in the more advanced stages of the complaint, such is the force of the muscular contractions, that his heels are brought into contact with his head, and he is flung sometimes actually out of bed, on the floor. If you feel his pulse in one of these paroxysms, it will be found hard and rapid; his face is bathed in perspiration; and his tongue, from protruding between the teeth, is often severely injured by the constriction of the jaws.

During the remission, the breathing remains hurried and irregular, but the pulse is not far from being natural. Well, in this state he strives to cough up a viscid saliva, which adheres to his fauces, and if you should ask him where he feels pain, he will point it out as extending from the pit of the stomach, along the diaphragm, to the spine. His appetite is generally good, and he is even desirous to eat, but dreads swallowing any thing. The bowels are usually costive; the secretion of urine is scanty, and is sometimes passed with difficulty. It is a remarkable circumstance attending this disease, that the patient never complains of his suffering, but if you question him on that head, he will tell you his pain is severe beyond endurance, yet he bears all in silence. Well, what is generally the duration of this disease? Why, taking the ordinary period to which it extends, it mostly terminates fatally in three days; but we are told in books, that if the patient survives to the seventh day, he will recover. When the progress of the disease is slow, and the symptoms moderate, he may escape, but when they come on rapidly, say in twelve hours after the soreness in the throat has been felt, the chances are, that the patient will die even before the third day.

Now we might suppose, that the characters of this disease could not be confounded with those of any other; yet there are few diseases which have been so frequently mistaken for others, as tetanus. The peculiarity of the countenance alone, indeed, ought to be sufficient

to prevent such errors, for I never saw in my life but one tetanic expression of face; it was precisely the same in all the cases which came under my observation. The forehead and eye-brows are contracted; the angles of the mouth drawn downward and backward; the teeth considerably exposed; and if you only once examine such a countenance minutely, you can never forget it. There is another symptom peculiar to this disease, and it is this, that the rigidity of the muscles never relaxes, though the disease should continue for twenty days. Another remarkable circumstance is, that each paroxysm consists of one universal spasm of the system. Still has this disease been confounded with a variety of others, and it is only by such mistakes that we can account for the number of cases which are said to have been cured by the most trifling means. Among many of this kind, I have read the case of a lady who had been cured of tetanus which continued for three weeks, by an injection of *asafoetida*. There is a form of hysteria bearing some resemblance to tetanus, in which the patient lies with the eyes half closed; the paroxysm will last for half an hour, or perhaps for half a day; and observe that neither the tetanic expression of countenance, nor the rigidity of the muscles is present here. Such an attack may be induced in very nervous females, by the communication of bad news, or by being suddenly excited in any other manner. I recollect being once asked by a physician to see a patient affected with tetanus, as he thought, and when we entered the lady's apartment, we found her walking about, and he regretted that we had not come in at a time when she happened to be in a spasm of the disease. No surgeon could possibly mistake such a case for tetanus, at least we can seldom get our patients to move about in the course of the disease. There are other spasmodic affections produced by wounds, and which have been confounded with tetanus, but in these cases the spasms will relax perhaps twenty times in a minute, whereas no such thing ever occurs in tetanus. In that disease there is but one continued spasm while it lasts, and when it subsides, the muscles will be found in the same rigid condition in which they were before the accession of the paroxysm. The pain extending from the pit of the stomach to the spine complained of in tetanus, is also felt in hydrophobia, and the same efforts made to cough up a viscid saliva; but there are so many symptoms to distinguish these diseases from each other, that they can hardly be confounded.

With respect to prognosis in this disease, the cases of recovery are few indeed; but some, however, will recover. When the symptoms come on slowly, and are not violent, there is a chance of recovery; but when the reverse of this takes place, a fatal termination may be expected. Well, then, should the patient live to the ninth day, would you say that he would escape? Certainly not, for I have seen a man die after the twenty-first day. I have also seen two very remarkable cases of lock-jaw, in which the patients entirely recovered from that disease, but afterwards died of an extraordinary affection of the chest. In these cases, the rigidity of the muscles had entirely disappeared, and the limbs were completely flexible. One of these cases was that of a young man whose arm had been dreadfully lacerated by the cylinders of a mill, and who had tetanus in consequence, from which he recovered, but was soon afterwards attacked by a cough, and at almost every expiration he threw up nearly a pint of fluid resembling the port wine injection used in the cure of hydrocele after it had been discharged. He continued to cough up this fluid for three days, and died. The other was that of a postman, who, in crossing a street, fell and injured his back, and got tetanus, from which he perfectly recovered, but died of the same affection as the former. I mention these two cases, because I am not aware that such a termination of tetanus has been recorded by any other surgeon. Well, then, do not pronounce your patient out of danger, until you see him walking about for some time after all the symptoms have disappeared.

I shall next consider the treatment of tetanus; but before doing so, I must call your attention to this fact, that Dr. Rush, who has written a great deal on the subject, has certainly cured more patients in this disease, according to his own account, than we can do at present, and that he obviously confounds other diseases with tetanus. He relates one case, for instance, in which the patient could be heard roaring six hundred yards, while affected with lock-jaw. Now I never heard in my life a single patient roar in tetanus; and, indeed, this circumstance alone would be sufficient to prove it not to be that disease at all. He gives another case of a man who was cured by drinking five bottles of madeira in the day. This is, indeed, very strange, for we cannot get our patients here to drink so many ounces in the same length of time. He also speaks of a case where a cure was effected by three ounces of bark;

but such cases, I need scarcely add, must have been different from tetanus. He tells us, too, that the appearance of the wound changes when the symptoms come on; that there is less of inflammation and suppuration than ought naturally to be present. I frequently examined wounds which were followed by tetanus, and never did I find, except in one instance, that the inflammation or suppuration was below the natural standard. This was in the case of a girl who had necrosis of the tibia, and in getting up behind a carriage, one of the spikes ran into her foot. In this instance, in which the patient died of lock-jaw, there was certainly less of inflammation and of suppuration than you might expect in such an injury. Now, according to Dr Rush, the local treatment of the wound is of the first importance, and he desires us to stimulate the part as soon and as violently as we can. Well, I have tried a variety of stimulants, such as blue stone, lunar caustic, corrosive sublimate, &c.; and among the rest, one of my own invention, muriate of antimony, saturated with corrosive sublimate, but without any other effect than adding to the tortures of the patient. I am now convinced, that there is connection between the state of the wound and the constitutional disease.

Another consideration is, whether we should amputate the limb, or whether this operation will save the life of the patient? I recollect having seen Mr. Obrey amputate a man's thumb, in Stevens' Hospital, which from a compound dislocation of the joint had produced tetanus; but he might just as well have left it on, for its removal had not the slightest effect on the disease. Yet Barron Larrey speaks of amputation in strong terms of praise, and recommends its performance in all cases where it is practicable; but we have lately put it to the test in Stevens' hospital, in the case of a man whose arm had been dreadfully lacerated, and he died in the ordinary period, just as if we had done nothing. We need not, therefore, look to the treatment of the wound to stop the progress of the constitutional disease. Well what are the internal remedies to which we are to resort in this disease? A great deal has been said in favour of opium, but with what justice I cannot pretend to say. I once thought I was curing a patient with this medicine, when in fact he was taking so small a quantity of it that it could scarcely have produced any effect; an apothecary's boy in the hospital, having by mistake made the opium pills, which I had ordered in large doses, not larger than pins' heads,

yet under this management, which was not discovered for some time, the man recovered. In what quantity then should you give the opium? You should give it in large doses, say to begin with forty or fifty drops of laudanum, and to increase the dose every third or fourth hour according to the severity of the symptoms. The tincture is preferable to the solid opium, as it affects the system much sooner, and is more readily given. Now what is to limit the use of this medicine? In many cases the largest doses will scarcely produce its specific effects, but when the eyes become suffused and the face appears turgid, you should diminish the dose, but still keep the patient under its influence. I have heard some surgeons say that they lost patients by constipation produced by its use. When it has a tendency to produce this effect, the best remedy is by glisters—much better than purgatives given by the mouth. I recollect when Dr. Hamilton's book came out that it was expected that every disease would be cured by purgatives, and they were tried in tetanus, but I always found that the patients died sooner under that plan of treatment than they otherwise would if it had not been employed at all. Well can we do any more? I believe we should always administer mercury, which should be given in large doses, and the ointment rubbed in along the course of the spinal marrow, so as to produce salivation as soon as possible, for from what we know of this disease there is no time to be lost. We should, however, be on our guard against giving mercury to excess, though I have never seen its use followed in this disease, by that peculiar affection of the heart and palpitation observed by other practitioners, and which not unfrequently occur in the venereal. It is generally very difficult to salivate patients in this disease, and we are told that if we can do so that they will recover, but I have seen them die while profusely salivated. In the idiopathic form of the disease, mercury will be found a much more valuable remedy than in the symptomatic. We are next informed that the warm bath is a serviceable remedy in tetanus, but I look upon it as quite useless. No doubt when you place a patient for the first time in a warm bath, he feels very comfortable, and longs for a second, which however, does not produce the relief from suffering anticipated, so that he rarely wishes for a third, and will seldom be prevailed on to try it a fourth time.

Now the very opposite to this has been recommended by Dr. Wright, and he really speaks of the cold bath as an infallible remedy; but if you examine his

cases minutely you will find, that they are not tetanic affections, for he represents the spasms as lasting ten minutes. I saw two cases in which the cold bath was employed, and really the difficulty of breathing, and other distressing symptoms which it produced were frightful beyond description. For my own part, I am convinced that no benefit can be derived from its use, and though Dr. Wright speaks of the disease as it occurs in a warm climate, I am greatly inclined to doubt the accuracy of his statements; for Dr. Chalmers, a man who certainly wrote from observation, describes the disease in South Carolina, precisely as it appears in this country. Musk, and other antispasmodics have also been recommended, but they hold out no prospect of success. Bark too has been spoken of, but I place no reliance whatever on its efficacy in this disease. Another plan of treatment, founded on the stimulating system of Dr. Rush has been adopted, and wine, spirits, &c. have been ordered to be given freely, but this plan does not succeed here. I have heard, indeed, of a case cured by the first dose of whiskey, but the case was clearly not tetanus, for no one ever saw that disease suddenly removed by any means. If the patient recovers, he does so gradually, and this very circumstance is quite characteristic of the disease. When you read of such cases then, you may consider them as entirely different from tetanus. When you come to dissect the body of a patient who has died of this disease, you are unable to detect any morbid appearances, which would in any manner account for the symptoms witnessed during life. You may perhaps find the extensors, and the recti muscles of the abdomen torn across and an effusion of blood in some parts of the body, but these are evidently the consequences not the causes of the disease. There are some times when you will not find a single case of tetanus in Dublin perhaps for a year, whilst at other periods the hospitals are crowded with them, and the pupils will be telling each other of the number of cases of this kind in their respective establishments.

I remember one summer when I was sick of looking at this disease, so prevalent was it at the time. Moist warm weather predisposes, in my opinion, to this disease. We should endeavour to prevent attacks by the application of some stimulant to the injured parts. For this purpose I think the spirit of turpentine by far the best agent that can be employed, as it possesses some peculiar property of producing a healthy inflammation and

suppuration in wounds. The next class of medicines which I have to mention, and on which, from my own personal observation I am inclined to place the greatest reliance, are sudorifics. I recollect two instances in which their use was followed by success, as far as we are able to judge of the efficacy of medicine. A man received a slight bruise, which was succeeded by lock-jaw; I immediately threw him into a perspiration, which I kept up for a few days, and he was much relieved; but on discontinuing the medicine for a few days, the symptoms returned. I had recourse to the same treatment again, and the man ultimately recovered. The other case, was that of a man who had received a severe injury of the loins, which was followed by incipient lock-jaw; I treated him in the same manner as the other, and he perfectly recovered of the disease. Mr. O'Brien, of this city, has found tobacco a successful remedy, but I have tried it without obtaining similar results; some persons, however, can do more with a particular remedy than others can, and I believe this substance deserves further trial. The idiopathic form of the disease is much more prevalent in warm than in temperate climates, and differs from that which I have just described, by being ushered in with a quick pulse and fever, and by being more mild and slow in its progress. It is by no means so formidable a disease as traumatic tetanus, and if judiciously treated seldom terminates fatally. Continued perspiration, the warm bath, and moderate use of opium will be highly beneficial; but indeed we should not confine ourselves to any particular class of medicines, but employ such as we conceive the nature of each case may require.

(Mr. Colles next adverted to that form of the disease called "trismus nascentium," which he principally attributes to a bad description of ulceration, taking place in the separation of the umbilical chord. It rarely occurs in private practice, and might probably be prevented by dressing the wound with turpentine, and by plunging the infant in cold water. Much he conceives will depend upon cleanliness, good air, and attention to the dressings of the infant, an opinion in which he has been confirmed by the report of a lady who had seen the disease checked by these precautions, in a place where it had been very prevalent.)

When the patient then is about to recover, you are not to expect that the severity of the symptoms will suddenly subside; for though the paroxysms will become less frequent, their violence may

not be diminished. In cases that are to end fatally, the patient may die during the paroxysm; but in most cases he becomes languid and heavy, and expires in the intervals between the spasms. It is a curious fact, that after one of these spasms he will tell you that he feels better, that his jaws admit of greater motion, so that an inexperienced person might suppose that the patient was about to recover; but immediately these fallacious symptoms often prove the certain precursors of death. I forgot to mention that you should keep a piece of wood, or cork will answer the purpose still better, between the teeth from the commencement, that medicine and food may be introduced when necessary.

It has been said that the body of one who dies of this disease runs sooner into a state of putrefaction, but I have not found this to be the case, though I have had some of them in the dissecting room. An examination of the body throws no light whatever upon the pathology of the disease. You may find effusion of blood in the brain, and other morbid appearances in other parts, but all these are common in other spasmodic affections which have terminated fatally. As to the nature of the disease, it possesses some of the characters of spasm; but yet it is the only disease in which the muscular rigidity is constantly present. This character has been overlooked in classing it with other spasmodic affections; for it strikes me that in classing any disease under a particular head, we should chiefly look to its permanent symptoms. In the progress of the disease the muscles are affected in regular succession, but you are not to suppose that all the muscles must first become engaged before the case terminates fatally, for the patient will sometimes be carried off a day before the disease will reach the extremities.

REVIEW.

Small-pox and Cow-pox; comprehending a concise history of those diseases, and a comparison between Inoculation for Small-pox, and Vaccination, &c.&c.—By JOHN JENNINGS CRIBB, Member of the Royal College of Surgeons. 8vo. pp. 80. Deighton, Cambridge; Longman & Co. and Underwoods, London. 1825.

As the histories of small-pox and vaccination, are either known to every one, or contained in cyclopædias and dictionaries, we pass over that part of the work which is devoted to those subjects, and proceed to the inquiry into the prevalence of small-pox amongst the inhabitants of Cambridge, during the twenty-five years which preceded the summer of 1824. In the autumn of 1823 it appeared at Cambridge, and ravaged the town and neighbourhood until the following April. There, as in other places under a similar visitation, many exaggerated reports of the inefficacy of vaccination were circulated, which led the author to investigate the subject, and to the results which he has stated in the little work now under analysis. He chiefly endeavoured to ascertain in what manner and to what degree the practice of vaccination had influenced the irruption of small-pox; or to what extent, under what circumstances, and with what degree of severity, small-pox had occurred in persons previously vaccinated. His inquiries were therefore limited to the twenty-five years which had elapsed since the promulgation of Dr. Jenner's discovery, and the results which he obtained are exhibited in the following table: