attended the sick in a very convenient hospital of 20 beds, while I looked after the sick in hospital and the sick who came as out-patients. We had about 120 cases of laryngitis and tracheitis. The symptoms, which were very similar in all the cases, came on quite suddenly. The patient often had a shivering fit or vomiting with nausea; 3 cases were admitted to hospital with rigors; the temperature rose to 102° or 103° , in some cases to 104° at the outset, in one case to 105° . The patient complained of sore throat, referring the pain to the thyroid cartilage and the region of the thyro-hyoid membrane. No swelling of the neck and no enlargement of glands was noticed in any of the 120 cases; there was much pain in swallowing referred to the same parts, and referred internally to below and on each side of the epiglottis. At night the patients were more troubled than during the day, the pain being often very acute, and in most cases there was a small amount of spasm of the glottis and much distress from this condition. Coughing—worse at night—was incessant for the first day or two. Expectoration was small in amount, and consisted of mucus only. After the first day or two the inflammation obviously spread to the trachea and produced sternal pain, soreness, and tenderness.

The progress of the disease was very similar in each case; The temperature remained about 101.2° for about a week, and then descended by lysis, arriving at the normal in about ten days from the onset. The cough continued, and was the most distressing of the symptoms after the spasm of the glottis, which only occurred at night and for the first two or three days of the disease had passed off. On examining the throat there was never any redness or swelling of the tonsils or soft palate, and only a slight redness could be seen in the pharyngeal mucous membrane in a few of the worst cases, the voice was husky and harsh at first for a day or so, it then became faint and stridulous, and often on the fourth or fifth day was entirely lost. It returned as the inflammation spread to the trachea. The nasal mucous membrane and the conjunctivæ were quite normal. One or two cases developed slight attacks of bronchitis. In no case was the Eustachian tube affected in any way; apparently some germ settled on the mucous membrane of the larynx and infected it.

As regards the diagnosis, the disease is not like any of the ordinary forms of laryngitis; there were no signs of measles, scarlet fever, diphtheria, syphilis, whooping-cough, or any other acute specific disease. The cases increased in number as we approached the line, the weather getting hotter and hotter each day, so it can hardly have been "rheumatic" in nature or caused by "cold"; in fact, I asked most of the patients if they had any signs of "cold in the head," and they nearly all said "No; the trouble was all in their throats and chest." The officers suffered less than the men, but in 4 who did the symptoms were the best marked of any out of the 120 cases.

The treatment adopted was entirely palliative; fomentations, inhalation, poultices, expectorants, and so on; nothing produced very much effect however. Our supply of drugs and other conveniences was, however, not very great. It may be interesting to note that our first 3 cases in hospital were ordinary cases of acute pneumonia, who were left at Queens-town.

REPORT OF A CASE OF TETANUS TREATED SUCCESSFULLY BY SERUM.

By G. LLOYD ROBERTS, M.B. EDIN.,
Carnarvon.

THE following case of tetanus, apart from the question of treatment, presents features of interest and some rarity:

On July 7th, 1899, I was called to see O. H., aged 33, a farmer, who was said to be suffering from severe abdominal pains, when I found that he had been laid up for the previous five days and treated for rheumatism and colic. He was lying in the position of slight opisthotonos, the head rigid and retracted, and an appreciable risus sardonius. He could open his mouth about $\frac{1}{2}$ inch. He had had persistent vomiting for the last two or three days, and was sweating profusely. The chest muscles were fixed and the breathing was abdominal in type. The abdomen was hard, tense, and extremely tender. The muscles of the upper arm were in spasm, and more on the left than on the right side. The muscles of the forearms were unaffected and he could move his legs freely. The superficial and deep reflexes were exaggerated. There was obstinate constipation, and slight mental perturbation was evident.

I ascertained that on June 7th the patient cut his hand while shearing

sheep. He says the cut was about $1\frac{1}{2}$ inch long, and went down to the bone. I observed its situation on the back of the left hand over the third metacarpophalangeal articulation. It bled profusely at the time of infliction, and, in order to arrest the hæmorrhage, he was advised to cover it with a plug of tobacco which one of his mates was in the act of chewing. This seems to have fulfilled its purpose temporarily for he went on working. Subsequently he worked at a potato field, and, the wound being insufficiently dressed, became contaminated by the soil. In due course there was suppuration in the wound, and he incised it himself with a pocket clasp knife. In the course of the next few days it appears to have closed several times only to be opened again by his knife. On June 20th, twenty-two days after the infliction of the wound, the wound was said to be healing satisfactorily, and, to "facilitate its recovery," he put on a large layer of cobbler's wax over the seat of injury, which remained on till the wound was fairly healed. On examining the site of the wound I saw nothing but the usual scab with the surrounding parts healthy. On pulling off the scab a dark red granulation was observed about the size of a pea, which when picked up revealed a little yellowish serum.

His first complaint was of pain in the back on Wednesday, June 28th, but he attributed this to strain. During the next few days, however, it increased in severity. On July 2nd he observed a slight difficulty of mastication. On July 4th his jaw was distinctly stiff, as also were the muscles of the neck, and later in the same day he experienced a severe stabbing pain below the angle of the right scapula. He went to bed, as the pain and stiffness increased. On July 5th medical advice was sought, and on this date, the 6th, and early part of the 7th, he was treated as stated above until the evening of the 7th, when I was called in and observed the appearances described.

Being now quite satisfied as to the nature of the condition, I gave a large enema to relieve the constipation, with a satisfactory result. Doses of $\frac{1}{2}$ ss of bromidia were ordered every two hours, and he was fed on milk and beef tea by an œsophageal tube. Later in the day I gave gr. $\frac{1}{4}$ of morphine to promote sleep, and wired the same day for a supply of Burroughs and Wellcome's antitetanus serum.

The progress of the case was as follows:

On July 8th, at 10 A.M., the rigidity was more marked, and there was inability to move the limbs, with marked opisthotonos and severe seizures. The vomiting had ceased. At 6 P.M., after having had several seizures during the day, he was sweating profusely. Then 10 c.cm. of serum were injected for the first time deeply into the thigh. The dose of bromidia was increased to 3j every two hours.

On July 9th, at 10 A.M., a marked change for the worse was evident; opisthotonos was complete, and there was total rigidity of limbs and trunk, with severe seizures on the least excitement, as on touching the skin, shutting the door, or on a stream of light entering the room. The wound was well scraped, cauterised, and left exposed to the air; 10 c.cm. of serum were injected, and $\frac{1}{2}$ gr. morphine administered. At 4 P.M. the patient was in a state of acute tetanus. Full doses of chloral and bromide of potassium were given instead of the bromidia. Diplopia and ptosis were now observed for the first time. The platysma reflex was well marked. He suffered considerably from pain and hæmorrhage, due to biting of the tongue during the seizures; this exaggerated the spasms and interfered with sleep. At 8 P.M. gr. $\frac{1}{2}$ morphine was administered.

On July 10th, at 10 A.M., the seizures were more severe and more frequent. At 2.30 P.M. I injected 10 c.cm. of serum, and at 11 P.M. $\frac{1}{2}$ gr. morphine hypodermically. An enema was given while the morphine was having its effect. On July 11th, at 2 P.M., not being satisfied with the appearance of the wound, I decided to thoroughly excise and scrape it, with careful antiseptic precautions. Then 20 c.cm. of serum were injected into the flank. At 8 P.M. the muscles of the abdominal wall were not so tense, and the patient was obviously in a less critical condition. Chloral was stopped, as it appeared to induce coughing, peristalsis, and vomiting, and bromidia was given instead.

On July 12th, at 10 A.M., the patient was distinctly better; the sweating had disappeared, the abdomen was lax, and the patient could move his legs slightly. There were not many seizures during the night, and the pain was greatly diminished. The temperature had fallen to 100° F. At 8 P.M. I injected 10 c.cm. of serum.

On July 13th I was called to see him hurriedly about 6 A.M., and found him in a critical condition owing to spasm of glottis with retention of mucus. He was relieved by the ejection of a large quantity of mucus through the nostrils. I gave him $\frac{1}{2}$ gr. of morphine. At 10.30 A.M. the rigidity was less marked and the wound healthy. Any attempt at movement, however, produced a seizure. I injected 10 c.cm. of serum, and later in the day a second dose of 10 c.cm. in order to attain the maximum dose of serum (20 c.cm.) as soon as possible. His reflexes were still increased.

On July 14th, at 6 P.M., after having had several slight seizures during the day, he described his breathing and swallowing as distinctly easier. I injected 10 c.cm. of serum. On July 15th the rigidity was again less marked, the risus being not so pronounced. Ptosis and diplopia had disappeared. I injected 10 c.cm. of serum. On July 16th he could move his head slightly, and the rigidity was less marked, with the exception of the left arm and left side of the neck. I injected 10 c.cm. of serum. On July 17th there was another spasm of the glottis. On this date costal breathing was noticed for the first time. I injected 10 c.cm. of serum. From this date forwards the condition of the patient improved steadily until July 31st, when he could lift himself into the sitting posture.

His diet consisted during the acute stage of peptonised milk only. Later eggs were added, until as many as six were taken in the twenty-four hours. Beef-tea and dilute doses of brandy were also given until the eighteenth day, when solid food was taken.

His bowels were kept well opened by enemata and large doses of calomel, which were found most efficacious. The importance of keeping the bowel empty cannot be overestimated. It may be possible that the seat of inoculation in some cases is at some part of the alimentary tract. It is certain that in horses at least a so-called idiopathic form of tetanus has been proved to be due to infection by the swallowing of the gadfly, which has been seen in great numbers in the stomach in the necropsy.

The temperature did not at any time exceed 102° , as taken by thermometer in the axilla.

The following points are, I think, worthy of note: (a) The

source of the poison. The patient was directly exposed to inoculation on three different occasions: (1) The shears with which he was cut; (2) the pocket knife with which he incised the original wound; (3) the earth of the potato field which contaminated the wound. Moreover, the bacillus being anaërobic, every opportunity was afforded for the development of its toxins by the subsequent conduct of the patient in the treatment of his wound. The soil of the potato field above referred to had been contaminated some thirty years previously by being used as a deposit ground for the excreta of patients during a severe cholera epidemic in the town of Carnarvon.

(b) The usual period for development of the toxic effects of the organism has been variously given as from 1 to 22 days, and it has been further held that the longer the incubation period and the less severe the wound, the less acute the disease and the better the prognosis. In this case it is noteworthy that so far as one can ascertain definitely no marked symptom was observed for at least 22 days, and the wound was in no sense a severe one.

(c) Effects of the antitoxin: These were distinctly well marked, and I attribute the success of the treatment to its early administration, which undoubtedly prevented the case from getting into a prolonged acute stage. At first the effect was, apparently, to increase the severity of the tonic state; but after the minimum dose had been administered (50 c.cm.), the symptoms began to show signs of diminution. Every subsequent injection produced a further though less marked diminution of symptoms until the maximum dose (120 c.cm.) was reached, after which no immediate changes were visible for some time. The temperature and pulse rose after the injections, but fell again in a few hours. The reflexes were more marked after each injection. The greatest number of injections were introduced into the cellular tissue of the flank, but I am not sure whether deep intramuscular injections into the thigh are not better, as absorption is quicker and, owing to the depth of the injected fluid, there is less chance of suppuration. In this case, however, no injection point suppurated. Frequent injections of small doses were found to be better than a single injection of a large one.

(d) Excision of the wound: During this process the arterial blood was observed to be very dark and coagulated instantly; so much was this the case that it attracted the notice of the patient himself. Scraping and cauterisation were by no means so satisfactory as the complete excision wide of the cut eventually performed.

(e) The nervous symptoms: The left arm and left side of the neck showed a distinctly localised tonic of a higher degree than any other part of the body. The left shoulder-joint was completely immobile, the elbow-joint flexed, and the fingers flexed into the palm. The muscular pains were also more intense in these situations. It is difficult to explain the concentration of the poison in these areas, and whether the cause was central or peripheral. Again, the eye muscles were affected, although they are by no means usually so. The diplopia may be explained as being the result of unequal contractions, just as the spasm was specially intense in the left arm. The ptosis, which was present persistently for several days, is also an uncommon condition. The reflexes are, I believe, commonly increased in tetanus, and ankle-clonus has been noticed (Strümpell). Spasm of the glottis was a serious complication of this case, thus again demonstrating the fact of localised areas of concentration of the poison.

(f) Bacteriological examination: The bacilli were discovered plentifully in scrapings taken from the shears, in the soil of the field at the spot where the patient had been working, and in considerable quantities in the excised wound.

I am indebted to Dr. F. N. Menzies for help in the drafting of this report.

The annual dinner of the Pharmaceutical Society of Great Britain will take place on Tuesday, May 15th, at the Whitehall Rooms, Hôtel Métropole, London.

THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.—The ninth annual meeting of the Association of Military Surgeons of the United States will be held in New York on May 31st, June 1st and 2nd, 1900, at the New York Academy of Medicine, under the presidency of Colonel C. H. Alden, Assistant Surgeon-General, United States Army.

"GROWING PAINS" AS A SYMPTOM OF RHEUMATISM.

By E. M. BROCKBANK, M.D., M.R.C.P.,
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THE accounts of the valuable discussions at the Clinical Societies of London and Chelsea on the treatment of rheumatism and the prevention of valvular disease as a complication, which appeared in the *BRITISH MEDICAL JOURNAL* of March 17th, afford an excuse, if one be needed, for referring to the important and well known, though often neglected, indication of an attack of rheumatism in children, namely, "growing pains." In this part of the country this term is usually applied, especially outside the profession, to certain vague aches and pains which are supposed to assail the rapidly-growing anæmic boy or girl before or about the age of puberty. These pains mostly occur in the legs, and sometimes in the arms, and are looked upon as being the result of "overgrowing the strength," and apart from the discomfort they cause and the warning they give that the subject of them must "not do too much," and "ought to rest a good deal," they are not supposed to signify anything serious, and are certainly not worth consulting a doctor about. They are also soon forgotten, and no information about them is volunteered in later life, though they are readily remembered when asked after.

But there is no doubt that these growing pains are often— if not always—of rheumatic origin, and the physician inquiring into the cause of a diseased heart, especially of mitral stenosis, should not give up the rheumatic quest without making special mention of them in his investigations, though he has asked about previous attacks of rheumatism, chorea, or even "pains in the joints." The value of the question as being a means of finding out about previous attacks of rheumatism has been impressed on me this year by the experiences of 4 cases which, with another interesting one of earlier date, I will briefly relate:—

CASE I.—A youth, collier, age about 20, was admitted to the Manchester Royal Infirmary with mitral stenosis. He was quite sure that he had never had chorea or rheumatism and had not seen a doctor until just before entering the hospital. When asked about "growing pains" he at once replied, "Oh yes, I had growing pains in my legs when I was at school." He was not laid up with them and did not stay at home, but they were severe and he had to walk slowly to school, keeping up against the wall. They lasted for a week or ten days. Breathlessness on exertion developed four or five years afterwards, and for this he was eventually admitted into hospital, where it was found he had mitral stenosis.

CASE II.—A woman, aged 55, is at present in one of my beds at the Ancoats Hospital suffering from mitral stenosis, with cardiac irregularity and extreme dyspnoea. She is certain she never had chorea or rheumatism, but remembers very well having "growing pains" as a child at the age of 10 and 12. They were very severe, making her cry, and her legs had to be wrapped in flannel, but she was able to sit by the fire and had not to go to bed. She does not remember whether the joints swelled. After this age she was never considered to be "strong," and for fifteen years at least has suffered from dyspnoea.

CASE III.—A man, aged 30, under the care of Dr. Ledward in the Ancoats Hospital, suffering from mitral stenosis, with regurgitation supervening on some slight form of congenital heart disease, probably perforate foramen ovale, for he has been slightly "blue" from birth. He never had chorea or rheumatism, but when young suffered from severe "growing pains" in his knees. He was not kept to bed by them but was unable to walk.

CASE IV.—This case is interesting as being evidence of the wide use of the term "growing pains" in the artisan classes. She is a woman, aged 32, with mitral stenosis in an early stage, and was in Ancoats Hospital up to March 19th. When I first questioned her she was very emphatic in stating that she had never had chorea or rheumatism. She was equally certain that she had suffered from growing pains, beginning from when she was 8 years old. The pains were in her knees, ankles, wrists, and back, and were severe enough to keep her in bed for a week on several occasions, some of which were after her marriage. In this case a doctor was seen, and he called them "growing pains." On my next visit she told me that she had asked her mother about the pains, and she said they were due to rheumatism.

CASE V.—A girl, aged 17, was recently in Ancoats Hospital with typical mitral stenosis. She had eighteen months previously been in the hospital with rheumatism and heart disease. Before her first stay in the hospital she had not had chorea or rheumatism, but when aged 12 she was troubled for six or seven months with "growing pains" in her arms and legs, which were worst in her knees, and severe enough to make walking uncomfortable. She was not obliged to stay at home.

In all these cases, if the inquiry after previous rheumatic attacks had terminated with the history of no rheumatism, chorea, or pains in the joints, the valvular lesion would have appeared to have been non-rheumatic in origin, whereas the specific question about "growing pains" obtained a history