ness was followed by alarming delirium. The secondary rash—a most characteristic sign—has appeared almost invariably on the sixth day of the disease, first on the palms and wrists, and then on the arms, legs, soles of feet, and perhaps the whole body. It is best marked on the extensor surfaces of the arms and legs, especially above the knees. On the palms it is seen as numerous circular, dusky-red, discrete, slightly-elevated spots, about the size of a pea. In a few hours it can be seen on the arms, legs, and perhaps body, as elevated circular red spots, which at first are discrete, but after a time enlarge and coalesce. The rash is accompanied by great irritability. It begins to fade twenty-four hours after its commencement, first from the hands, wrists, and arms, then from the neck, face, thighs, and body. Forty-eight hours after its commencement it has disappeared. Desquamation in this epidemic has been trifling. The second rash has never been accompanied by more than a trifling rise of temperature. In a few cases the joint pains have recurred. Enlargement and tenderness of the superficial lymphatic glands have accompanied or preceded the secondary rash in a large number of my cases. In the textbooks this glandular affection is only mentioned as a complication or sequela, and Dr. Stedman does not mention it at all. I have found the superficial cervical, axillary, inguinal, and supracondylar glands at the elbow-joints affected in the above manner in at least 75 per cent.

Convalescence and Sequelae.—With few exceptions, after disappearance of the secondary rash, convalescence has been quick and no ill-effects have remained. Troublesome joint pains, with swelling and tenderness, have persisted in a small percentage of cases. In one patient under my observation, although the second rash disappeared on July 14th, swelling and pain in the ankles, wrists, fingers, and toes still exist (August 8th). For three days these pains were bad enough to render the patient almost helpless. It is now twenty-one days since the rash disappeared from my own body, and while I write I still feel twinges in my wrists and fingers. As at the onset, the joints most frequently affected are the wrists, ankles, and finger-joints. In this epidemic I have neither seen or heard of any deaths. The after-effects, so troublesome in adults, in this disease are rarely seen in children.

Diagnosis.—The sudden onset, the pain and stiffness in the fingers and other joints, with frontal headache and suffused eyes, are so characteristic that there has been little difficulty in quickly arriving at a correct diagnosis. The appearance of the rash of course drives away all doubt. The Burmans and natives of India here seem familiar with the disease, and distinguish it at once from malarial or any other fever. The Burmans call it "Tok-kive-ana," "the tying or drawing together disease." The first word, "tok," means to tie together, as the hands and feet, one hand with another, or hands and feet together. "Kive" means to draw together at the ends, as a bow. They have a theory that the disease visits the country every thirty years.

Prevention.—On account of the infectiousness of the disease it is important to segregate those attacked. The medical man and attendants should be especially careful to change their clothing and to use every effort to disinfect their persons before mixing with other people. In this epidemic I know of two instances in which the doctor probably carried the disease. In one instance the victim was a patient with enteric fever. In the tropics among the natives it is impossible to carry out the principles of segregation satisfactorily. They look upon the disease as trifling. In the case of Europeans, however, much can be done to prevent its spread.

Treatment.—The treatment resolves itself into combating the fever and palliating symptoms. The patient should be confined to bed, put on light diet, and should remain in his room until the second rash has disappeared. For the pain and headache and also to reduce the temperature I have found phenacetin with caffeine beneficial. In addition to this, I prescribe a simple diaphoretic mixture containing nitrous ether and potassium nitrate every four hours. Sodium salicylate is also useful in the febrile stage. If the temperature rises to 104° or 105°, sponging or bathing with water at 98° or 99° F. should be resorted to, and is most comforting to the patient. This is an efficacious way of treating the pyrexia in children when accompanied by delirium. During con-

valescence a tonic containing a few grains of quinine, three or four times a day, is required. The after joint pains should be treated with sodium salicylate, potassium iodide, and belladonna internally, and stimulating liniments externally.

THE TREATMENT OF AGUE BY THE HYPODERMIC INJECTION OF QUININE.

By JOHN SMYTH, M.D., LIEUT.-COL., A.M.S.,
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In the different medical periodicals papers have from time to time appeared of late whose perusal would lead the readers to believe that this method of using quinine was some new thing. The writer of a recent note on the subject, although he has not been using quinine hypodermically for more than a very brief period, and that in only a very few cases, seems under the impression that he is more or less the inventor of the method, and is not sure whether it should not go by his name. It is but another instance of how the work of the profession in the tropics is a closed book to our brethren in Europe.

It is five and twenty years or more since Colonel Terence McGann, I.M.S., began the treatment of ague by the hypodermic use of quinine. It is about six years since Colonel Benson, I.M.S., read a paper at the Medical Congress in Calcutta detailing many hundreds of cases so treated by himself; and in the Victoria Hospital, Bangalore, in which large numbers of ague cases are treated, quinine is but rarely given by the mouth. So it will be seen that this so-called new method is a very old one indeed. But this note would hardly have seen the light if it had not been that one of the most distinguished of malarialogists has advocated the intramuscular use of quinine, and that I have myself been recently a victim to this procedure. It was done quite accidentally, the quinine entering the substance of the triceps brachialis. This was followed by considerable swelling, and the arm was useless for several days. A 5-gr. dose had been used. At the same time a similar dose was injected into my other arm but strictly subcutaneously, and this caused me no inconvenience whatever. So my advice is, avoid the intramuscular use of quinine.

The following is the method of using quinine hypodermically, which is, I believe, mostly practised in India.

Either the hydrobromate or the bisulphate is used. The former is the more soluble salt, but the latter is possibly the more powerful, and is freely soluble in warm water, in the proportion of 1 gr. in 4 minims of warm distilled water. A solution of the bisulphate of this strength requires to be warmed before use, so as to dissolve the crystals that have been deposited on cooling. This warming is done by placing the bottle containing the solution for a few minutes in half a cup of hot water. The dose usually administered to an adult man or woman is 5 gr., but for men of large stature 10 gr. is not too much in a severe attack. But 10 gr. may be used for any adult if the fever refuses to fall with the smaller doses. Osler uses 30 gr., but I never saw a case requiring such a dose, and I fear it would kill most of the patients who come under my care. Doubtless, however, Osler selects his cases carefully. Having warmed the quinine solution the skin of the part to be operated on is disinfected with perchloride of mercury or carbolic acid. The back of the upper arm or flank is the best place to choose.

The next step is to wash out the syringe repeatedly with hot water and smear the needle with carbolized oil. By thus heating the syringe all tendency for the quinine to be precipitated in the needle is avoided. The solution is then injected quickly into the subcutaneous tissues, avoiding, of course, the position of important vessels or nerves. The injected quinine will be found to form a bleb under the skin, which should be at once dispersed by gentle friction with a finger smeared with carbolized oil. If this precaution be not taken a painful lump will be left at the seat of the injection, which will remain there for months. When done as thus described the hypodermic injection of quinine is hardly more painful than that of morphine. Indeed it is very often absolutely painless. Why it is sometimes painful, even when carefully injected, I

do not quite understand, unless the solution has been poured around a nerve of some size.

But I have never known the actual injection to be painful to any very objectionable degree. An infant, aged 2 years, may have 2 gr. of quinine thus administered in the fat of the buttock, and it will run off as if nothing had happened. Care must be taken not to inject the quinine endermically. Quite recently I have seen a case in which this was accidentally done, with the result that a piece of skin the size of a shilling sloughed out.

As to the efficacy of the method, I have no doubt that quinine thus used is more efficacious, dose for dose, than when administered by the mouth, while the cost of treatment is very much less, the patient is saved the misery of having to swallow a nasty draught, and the ordinary disagreeable symptoms of cinchonism are not developed.

But the praises lavished on solitary injections can only be the outcome of a very limited experience. For example, I have a temperature chart before me which shows that daily injections of 5 gr. for five consecutive days had no apparent effect on the course of the fever; the drug was then administered in 5-gr. doses thrice a day by the mouth for five more days, one hypodermic injection of 5 gr. of quinine being given on the fourth of these days, and the fever disappeared.

I have another chart of a case of most pronounced malarial cachexia, with anaemia, ague cake, and tachycardia, accompanied by great prostration and breathlessness. This is about the worse case I have seen recover. Five daily hypodermics consecutively given seemed to have stopped the fever, or, rather, greatly lessened the daily range of temperature, but in a few days the fever again set in. I again began with 5 gr. hypodermically, but the next day, as the fever showed no remission and the case seemed hopeless, the tachycardia being most distressing, while the patient sank into the too well-known condition of apathy, I injected 10 gr., continuing this for five days, when the temperature fell to 99°; thenceforward for five days more quinine was continued hypodermically in 5-gr. doses, with the result that the temperature rose no more, and the patient thereafter made steady progress. His last injection was on March 1st last. He is still in hospital, convalescence being well advanced. The palpitation has almost or quite ceased, he is putting on flesh, and is able to get quietly about for several hours a day.

I hope I have said enough to show there is nothing new in the use of quinine hypodermically, but that it is not the marvellous remedy some of its inexperienced advocates believe it to be; and lastly, that in the execution of the process the drug should not be injected into a muscle.

CASE OF SNAKEBITE IN THE LAKE DISTRICT.

By WILLIAM ALLEN, M.B., C.M.,
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As few cases of snakebite have been recorded in this country, the following, which happily recovered, may prove interesting. Mr. J. P., aged 30, was walking through a wood on September 21st, 1902, when he came across an adder or viper (*Vipera berus*) which was basking in the sun. He procured a forked stick with which he held down the head of the snake, while he cut it off with a sharp knife, leaving only about one-eighth of an inch of body attached. In from fifteen to twenty minutes afterwards he took up the head to examine it, between the thumb and index finger of the right hand, when it bit him on the middle finger just above the nail, with one of the fangs only. A drop of blood appeared at once from the wound, which he sucked three or four times and spat out.

Pain began in a few seconds, and was like a wasp sting, shooting up to the armpit. He proceeded at once to the village, which was about half a mile away; after going about fifty yards his sight gradually grew dim and difficulty of breathing came on. That passed off, and was followed by a tingling sensation in the tongue, back of the mouth, and lips, which became swollen, the tongue protruding from the mouth. In a little while pain set in in the stomach, which prevented his walking, and he lay down on the grass. Cold sweats came on, the perspiration dropping off the face in

large drops; he then began to vomit, after which he felt easier, and was able to get to a neighbouring cottage.

He was seen professionally at 5 p.m., an hour and a-half after being bitten. He was suffering from collapse, with severe vomiting and diarrhoea. His sister, who was with him, had administered brandy and applied baking powder to the tongue previous to my arrival. I examined the finger, but could only find the slightest scratch, which I cauterized, and then administered a good dose of sal volatile; as the vomiting continued we gave him soda water and brandy—about half a pint of the latter in all. The collapse was treated by the usual methods.

The pupils were slightly dilated; the pulse was 110 and imperceptible at the wrists; the extremities were cold and the body bathed in perspiration. There was slight drowsiness, but he was quite conscious when spoken to. The temperature was normal and there were no convulsions. The swelling of the tongue had disappeared when I saw him, but the fauces were very red and swollen. There was no difficulty of breathing, but a feeling of tightness round the throat. I remained with him until 11 p.m., after which time he only vomited once. There was a little blood in the vomited matter.

The following morning I found the arm very much swollen and exceedingly painful, with fine red lines running up towards the axilla, to which I applied caustic, followed by fomentations of lead and opium. The patient was decidedly better generally and able to take liquid nourishment.

On September 24th the arm and the right side of the chest were covered by large ecchymosed patches, of a distinctly greenish colour, the swelling also was very considerable, but pain very much less. The discoloration and pain gradually subsided, and on September 29th the patient could use his arm freely and was able to both shoot and paint. There was no loss of power in the arm.

The case is interesting, seeing that the bite occurred a considerable time after the head had been detached from the body. The snake, which was 19 in. long, contained seven eggs, one of which had just hatched, the young snake measuring 6 in.

The Croonian Lectures

ON THE

NATURAL HISTORY AND PATHOLOGY OF PNEUMONIA.

By THE LATE J. W. WASHBOURN, C.M.G., M.D., F.R.C.P.,
Physician to Guy's and the London Fever Hospitals; Consulting Physician
to His Majesty's Forces in South Africa; etc.,

Delivered at the Royal College of Physicians, London, on
November 11th, 1902,

By W. HALE WHITE, M.D., F.R.C.P.,

AND EDITED

By J. W. H. EYRE, M.D., ETC.

[ABSTRACT.]

[DR. HALE WHITE said that the lectures he was about to deliver had been prepared by the late Dr. J. W. Washbourn, who was the Croonian Lecturer appointed for the year 1902. Before his death he had written the lectures in rough, and the task of revising and arranging them had been very kindly undertaken by Dr. J. W. H. Eyre.]

Pneumonia is a general term implying simply "inflammation of the lung tissue;" and as such includes all inflammatory processes occurring in the lungs, no matter how widely these may differ in their clinical phenomena or in their pathology. These remarks, however, relate chiefly to that form of pneumonia known as acute lobar pneumonia. Lobar pneumonia is defined as an acute infective disease, characterized anatomically by an inflammation of the lung tissue, resulting in the accumulation of fibrinous exudation, leucocytes, etc., within the alveoli, and clinically by a definite and fairly constant set of physical phenomena, directly consequent upon the anatomical changes. Ana-