SOME CASES OF VACCINE THERAPY.

By W. M. CROFTON, M.B., R.U.I.,

SUTTON BRIDGE.

THE routine estimation of the opsonic index in the treatment of localized infections is, for the busy practitioner, practically an impossibility. There are a large number of cases of strictly localized infections, such as acne, syphilis, lupus, etc., which may be safely treated without reference to this. The following are a few examples of cases, most of them strictly localized, treated in general practice, and most of them without estimating the opsonic indices of the patients.

The hypothesis on which the treatment is founded is not that of Wright. I came to the conclusion some years ago¹ that opsonin and complement were probably identical, and that permanent immunity was conferred by a heat-stable body of the nature of immune body, which fixes the complement on to the microbe. Recent work has tended to confirm this. Granted that this is true, it was necessary to modify the method of vaccination in order to increase appreciably the amount of this substance in the system. It is customary to vary the dose of vaccine according to the state of the opsonic index. To increase immune body a large increase of dose is necessary at each injection. In my early cases, of which the first below is an example, having access to a laboratory, I used the opsonic index as an indicator to make sure the patient was not in a negative phase when having the next injection—that is, had recovered from the diminution of the complement which, as a rule, follows an injection. The later cases, as in the last three below, were treated without this knowledge, the intervals being judged by the amount of local and general reaction and the previous experience of myself and others. The first dose was always small, and varied with the condition, age, etc., of the patient. The succeeding doses were largely increased at each vaccination—for example, in an adult case of localized staphylococcus infection the first dose would be: $\frac{1}{2}$ c.cm. of a vaccine containing 200 million cocci to the cubic centimetre, the next dose, as a rule a fortnight to three weeks after, 1 c.cm., the next 2 c.cm., the next 3 c.cm., the next 4 c.cm., and so on. I make it a rule, if possible, to give a final large dose after the patient is apparently cured, and find this has a potent influence in preventing relapse; the only relapses I have had were in patients who refused it.

CASE I.—Chronic Pyaemia.

History.—Two years before I saw this patient, a male, aged 40, he had an attack of acute osteomyelitis at the site of an old injury to the right humerus; the bone broke and the arm was amputated through the shoulder. A bad prognosis was given. He recovered from the operation, but got abscess after abscess more or less all over his body, especially about his legs and in the stump. He was bedridden for two years, any attempt to get up being followed by an abscess somewhere about his legs.

Condition at Beginning of Treatment.—He had a puffy swelling round the ankle joint, which unfortunately resolved so that I could not obtain the causative microbe. I estimated his opsonic index for *Staphylococcus albus* and *aureus* and found it 0.8 for the former and 0.9 for the latter.

Treatment.—I determined to vaccinate him against these two organisms, as either of them was the most likely cause of his trouble. His first series of injections were done under the control of the opsonic index. The strength of the vaccine was 2,400 million cocci to the c.cm. He got 2,400 million *Staphylococcus albus* to start with, then 3,000 million *Staphylococcus aureus* three days after, then 7,200 million *Staphylococcus aureus*, then 8,800 million *Staphylococcus aureus*, then 10,500 million *Staphylococcus aureus* as before at three or four days' intervals. He felt so well, his ankle swelling having disappeared, he was allowed up and given 20,000 million of a mixed *Staphylococcus albus* and *aureus* vaccine before going to a convalescent home. Two days after this injection his index was 1.4. When a fortnight at the home he got an abscess in the stump, but he said it did not make him feel ill as the others had. From this abscess I obtained the causative microbe and found it a *Staphylococcus albus*, and from it made a vaccine containing 5,000 million cocci to the cubic centimetre, and gave him 1 c.cm. to start with, 2 c.cm., then 3 c.cm., and lastly 5 c.cm., at intervals of ten days to a fortnight, making sure before each injection that he was not in a negative phase. The abscess was quite healed after the third injection. There was a good deal of reaction in the stump after the last injection, but no pus formed.

Result.—He went home perfectly well a week or two later, and has remained so ever since (three years).

I should not now give the injections at such short

intervals as in his first series of injections. I have no doubt he would not have relapsed if the first vaccine had been specific.

CASE II.—Tuberculous Disease of Hip-joint.

History.—A girl, aged 16, had been confined to bed four and a half years, having spent one year in a local hospital, where amputation had been advised, and had been recently returned from a London hospital as incurable. She had had numerous abscesses about the hip, which had been evacuated.

Condition at Beginning of Treatment.—There were two sinuses, one below the anterior superior spine, and one some inches lower down, through which abscesses had recently discharged. Dead bone could be felt through the upper one.

Treatment.—She had injections of tuberculin (T.R.) as follows:

	Mg. (Old Measurement).
June 23rd, 1907	0.0001
June 30th	0.0002
July 21st	0.0004
July 21st	0.0005
August 4th	0.001
August 18th	0.005
September 1st	0.01
September 16th	0.05
September 29th	0.1
October 13th	0.4
November 3rd	0.8
December 1st	1.0

She had a temperature from 99° to 100° F. with headache for twenty-four to thirty-six hours after the first few injections; after the later one she had none. This discharge from the sinuses progressively decreased, and the sinuses gradually healed up, so that at the time of the last injection one sinus was completely healed, the other was also healed except for a little granulation tissue at the opening.

Result.—The patient is now (July, 1908) perfectly well, and has been so for six months. Her hip-joint is, of course, ankylosed.

CASE III.—Eczema.

History.—A man, aged 28, who had had eczema more or less since infancy.

Condition at Beginning of Treatment.—Covered with weeping eczema over most of face, trunk, and limbs. Irritation extreme.

Treatment.—Lead lotion was applied locally, and he was given $\frac{1}{2}$ c.cm. of a mixed *Staphylococcus albus* and *citreus* vaccine containing 200 million cocci to the c.cm. This was followed by 1 c.cm., 2 c.cm., and 3 c.cm. of the same vaccine at about three-weekly intervals. After the last dose he had only a small patch of scales on the calf of one of his legs.

Result.—I could not induce him to have a last big dose, although I told him he might relapse. He has, however, kept practically well ever since (one and a half years). The last time I saw him he had a small patch of scales over one shoulder blade.

CASE IV.—Sycosis.

A male, aged 40, had had sycosis for months of his upper lip, extending into his beard. There were two deep pits. The disease was extending. I gave him $\frac{1}{2}$ c.cm. *Staphylococcus aureus* vaccine, containing 200 million cocci to the c.cm., increased as in the last case at three-weekly intervals. He was practically well after the last dose and refused to have another. The consequence was he got a slight return, but nothing worth speaking about.

These few cases will serve to illustrate the method of vaccination. The last two show the necessity of the last big dose referred to in the preamble.

The method may also be of use as a prophylactic measure. If the children of tuberculous parents were given a few increasing doses of tuberculin when infants it would eliminate their tuberculous tendency.

I gave my baby 0.0001 mg. T.R. when she was 3 months old and 0.0005 mg. three weeks after. She had a temperature of 99.5° F. after the first with slight malaise, and a temperature of 101° F. after the last with a good deal more malaise. Her parents are not tuberculous, but I considered she was much more likely to get tuberculosis than small-pox.

CONCLUSIONS.

1. That it is legitimate to vaccinate patients with strictly localized infections without estimating their opsonic indices.

2. That materially increasing doses are necessary to confer any permanent immunity.

3. That vaccines given in such a way may prove of prophylactic use.

REFERENCE.

¹ *Journal of Hygiene*, October, 1905.