and the remaining muscles of the shoulder girdle partially atrophied. The wasting was less complete on the right side than on the left—the converse of the father's case—but the same muscles were affected. In the son the winging of the scapulae had not attained to the advanced stage seen in the father.

Fig. 3.

The last picture (Fig. 3) gives a front view of father and son together. A grandson, aged 3 years, was examined carefully, but showed no abnormality.

Ossler mentions the hereditary nature of the complaint, but it must be rare to see father and son side by side suffering from atrophy of identically the same group of muscles, which commenced at practically the same age—namely, 22–25—in each case. In neither case was there any history of a preliminary hypertrophy.

REMARKS ON THE BACTERIOLOGY AND TREATMENT OF YAWS (FRAMBOESIA TROPICA).

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Yaws is prevalent in the Gilbert Islands, and also, but to a less extent, in the Ellice Islands; yaws, syphilis, and tuberculosis forming the bulk of the diseases in the Protectorates.

Bacteriology.

Recently I made bacteriological examinations of the secretions of the yaw papule in two series of cases. The first series consisted of 20 cases, the method of staining being Leishman's. In the second series 10 cases were examined, and the films stained with the gentian violet and acetozone solution recommended by Dr. Alex. MacLennan of Glasgow. In each case six films were examined.

In the first 20 cases, examined by Leishman's method, the following were the results:

1. Pyogenic organisms:

- (a) *Staphylococcus aureus* and *albus* in large numbers.
- (b) *Streptococcus pyogenes* in smaller numbers.

2. Large bacilli with square ends containing spores, occurring in groups, and more numerous in some specimens than in others.

3. Large cocci occurring in pairs.

4. Occasionally a spirochaete, presumably the spirochaete described by Dr. Aldo Castellani of Ceylon.

In the second series of 10 cases the following were the findings:

Staphylococci and streptococci in all the cases.

Bacilli similar to those in the first series in 5 cases.

Large cocci in pairs in 6 cases.

The spirochaete in 7 cases.

Several forms of spirochaetes, presumably transitional, similar in many respects to those figured by Dr. MacLennan in his paper on the *Spirochaeta pallida* in the BRITISH MEDICAL JOURNAL of May 12th, 1906.

Some spirochaetes had a thickening on one side of the ring, not unlike a signet ring. The spirl in some instances began close to the ring; in others there was a straight portion before the commencement of the spirilla. Others had a vermiform shape with a thickened part in the middle of the curve, but no spirl. Whether these forms are modifications or transitional stages of the spirochaete of Castellani, or whether they are different varieties of spirochaetes, I cannot say.

Fig. 1. Fig. 2. Fig. 3. Fig. 4.

Fig. 1—Transitional forms (?). Fig. 2—Spirl beginning close to ring. Fig. 3—Spirochaete with straight interval before beginning of spirl. Fig. 4—Vermiform spirochaete with thickened centre.

Observing that large numbers of flies infested the yaws hospital, I caught several dozen in wide mouthed sterilized bottles and inoculated agar tubes with them. Growths were obtained which on examination showed the presence of the same organisms as were in the secretions obtained direct from the yaw papule, with the exception of the spirochaete of Castellani. The absence of the spirochaete in these preparations may be explained by the legs and bellies of the flies coming in contact with the surface of the papules where the pyogenic organisms are numerous, as since making these experiments I have found that when I removed the crust of hardened pus from the papule, or wiped off the purulent secretion and then inoculated the agar with the comparatively clear secretion of the subjacent papule, I was generally successful in finding the spirochaete. However, in spite of my failure to find the spirochaete in the growths obtained by fly inoculations, I am of the opinion that, as flies infest the native houses and are in frequent contact with the bodies of the natives, infection must often take place in the early stage of the yaw papule, before the secretion has become purulent or a crust formed, by the transference of the spirochaete to other natives, especially those who have sores or abrasions on their persons.

Treatment.

The patients are washed night and morning with carbolic soap, and ung. hydrarg. nit. dil. (1 in 3 vaseline) is then applied to the papules. The ointment serves a double purpose, acting as a germicide and also preventing the flies carrying infection to the other patients in the hospital. In two years' experience in Tarawa, I have not had a single case of yaws arising in the General Hospital, although it is only 60 yards distant from the yaws compound. Potassium iodide is given three times a day in doses of 10 to 20 grains to adults and of 2 to 5 grains to children. Those patients who are anaemic or debilitated receive iron citrate or syrup of iron chloride along with cod-liver oil or petroleum emulsion in addition to the iodide. I tried various preparations of mercury at first, but they had no effect whatever on the pains in the limbs or head, which is the principal symptom the patients complain of. The average time the patients are under treatment and till the papules have entirely disappeared is five weeks. Several cases, even those in which the eruption was extensive, have been cured in three weeks. The most troublesome cases are those in which the yaws are on the soles of the feet. Softening the thickened epidermis with sodium bicarbonate solution and afterwards scraping the skin away with a Volkmann spoon is the most expeditious method of treatment.

The paresis of the limbs which accompanies or follows yaws disappears rapidly under electric treatment. I have not seen the extensive destruction of tissue and bone which is described by some writers as the accompaniment or sequelae of yaws, and I am inclined to think that there may have been a syphilitic taint in the background. Certainly in the Gilbert and Ellice Islands such extensive necrotic processes as necrosis of the palate and nasal bones are due to syphilis and not to yaws.