infection by the *Diplococcus pneumoniae* rather than by other forms of organism.

As might be expected, the treatment by antistreptococcal serum was without any appreciable result on the course of the illness. Though the temperature fell slightly after the injections, the pulse and respirations were not affected. The identification of the *Diplococcus pneumoniae* was only completed by the result of the inoculation experiments, and so came too late to modify the vigorous antistreptococcal treatment pursued.

REFERENCES.

- ¹ *Obstet. Trans.*, vol. xlv, 1903, p. 128. ² *Ibid.*, vol. xlvii, 1905, p. 11.
³ *Trans. Amer. Gyn. Soc.*, 1898, p. 141.

A NOTE ON

THE ETIOLOGY OF GRANULOMA PUDENDI.

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THOUGH granuloma pudendi is extremely prevalent in British Guiana, the first adequate clinical description of it, by Conyers and Daniels,¹ only appeared in 1896. Later this was added to by Daniels,² Ozzard,³ and Fowler,⁴ and the disease has now acquired a position in manuals on tropical diseases, Galloway,⁵ in 1897, describing the pathological characters of the lesion. Though a better knowledge of the disease has shown it to occur in the New Hebrides, Solomon Islands, New Guinea, India, and North Australia, a particular causative factor has not been discovered.

During the past few weeks in British Guiana I have had an opportunity of examining cases of granuloma pudendi, and in three successively have demonstrated spirochaetes.

CASE I.—An extensive granuloma in the height of its activity, spreading up into the groin. Excised by operation. Smears made from the growth, just superficial to its fibrous base, but yet well below the surface, showed many spirochaetes when stained by Leishman's method. These were short and much resembled the *S. refringens*. On staining by Giemsa's method, others were visible; some of these presented a different character, having closer-wound spirals and being straighter and more rigid than the above. They were more like the *S. pallida*, yet, so far as I could remember from specimens seen recently in England, not exactly similar.

CASE II was almost exactly similar in the number of spirochaetes, their distribution, and reaction to stains.

CASE III is more interesting, in that extremely few spirochaetes were found when staining by Leishman's method, though always of the *refringens* type. Giemsa's method, on the contrary, demonstrated not a few of the closely-twisted spirilla which I have mentioned above.

All three cases were in black women, natives of British Guiana.

The readily-stained spirochaete, I have little doubt, is *S. refringens*. The second spirochaete gives cause for hesitation. If it be the *S. pallida*, this fact strongly supports the view of the minority that this granuloma is a manifestation of syphilis. However, in the present state of knowledge it is useless to speculate on the identity of spirochaetes.

I hope to pursue the subject later and forward a further report indicating its distribution, with the result of inoculation and cultivation experiments.

REFERENCES.

- ¹ Conyers and Daniels, *Brit. Guian. med. Ann.*, 1896. ² Daniels, *ibid.*, 1898. ³ Ozzard, *ibid.*, 1898. ⁴ Fowler, *ibid.*, 1899. ⁵ Galloway, *Brit. Journ. of Dermat.*, 1897.

A NOTE ON SYPHILIS AND CANCER, ETC., AND ON SOME PROTOZOA.

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Syphilis and Spirochaetes.

THE recent discovery of mobile spirochaetes in the primary and secondary, cutaneous and glandular lesions, and in some tertiary lesions of acquired syphilis, and in the skin and viscera of congenital syphilis, is of the highest interest in pathology. Dr. Schaudinn's¹ description of the *Spirochaeta pallida* of syphilis needs no confirmation, coming as it does from one of the ablest of modern protozoologists²; but if confirmation were needed, it has had it

amply. The organism (Fig. I, 4 and 5) is characterized by the numerous (10 to 26) spiral turns and by their permanence, as well as by its physical properties, which

include a low power of refracting light, whence the name "pallida." The commoner spirochaetes, such as the *Spirochaeta refringens* (Fig. I, 3), possess the spiral form only when in movement.

Before the appearance of Schaudinn's preliminary note² on another spirochaete (*S. ziemannii*) which during part of its life-cycle infests the white blood cells of birds, and during the remainder of its life-cycle

different parts of the body of the common gnat, bacteriology had claimed spirochaetes, confusing them with the spiral bacteria or spirilla. Now

we know that they are protozoa of most complicated life-history, including various forms, some of which, compared to the spirochaetes, are giant cells.

It will be instructive, in passing, to glance at some of the stages of *Spirochaeta ziemannii* depicted by Schaudinn as he found it in the bowel of the gnat, where, as with the malaria parasites, the fertilized mobile ovum cell (oökinet) undergoes development (Fig. II, 1). The original description (translated) reads:

The giant oökinet rounds itself off and produces in the gut of the gnat an enormous number of trypanosome-like offspring which change into true spirochaetes. The spirochaetes are thus not bacteria, but flagellates.

Now syphilis is a disease in which, as we know, the parasites' life-cycle is completed within the human host, so that if the *S. pallida* has to do with causing the disease, the other larger forms must be found in the tissues. They

Fig. I.—1. Molluscum body with oscillating particles; 2. Flagellate bodies derived from same; 3. *Spirochaeta refringens*, a common spirochaete. 4. *Spirochaeta pallida* of syphilis. 5. *Spirochaeta pallida* of syphilis (?) dividing (3, 4, 5 are after Schaudinn from *Deut. med. Woch.*, October 19th, 1905).

Fig. II.—*Spirochaeta ziemannii*, after Schaudinn. Stages in the intestine of the common gnat: 1. Oökinet, or adult mobile fertilized parasite. 2. The same, later stage elongated and coiled, and with several nuclei. 3. The same, still later stage, much convoluted, with multiple nuclei. 4. The same, rounded off, and giving rise to a multitude of small trypanosomes which change to spirochaetes.

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