

Snake-bite is not a very serious danger here, but in Brazil, and other countries where poisonous snakes swarm, the protection of the human population is a matter of great importance, and it has fortunately been found possible to prepare protective serum or "antivenin" against most varieties of poisonous snakes.

At the Butantan Institute, São Paulo, Brazil, the Director of which is Dr. do Amoral, where about 1,500 snakes are milked every month, large quantities of protective sera are prepared from horses and distributed in return for poisonous snakes sent from the interior.

Cutaneous Streptothricosis: A Case in Great Britain

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THE case is of interest because, so far as I am aware, no similar case has previously been reported in this country. The subject was a horse aged about 16 years, which entered the Serum Department of the Lister Institute (Elstree) in September 1936. Immunization with killed suspensions of *C. diphtheriae* was begun on November 3, 1936 and continued until January 28, 1937. I am indebted to Dr. G. F. Petrie for drawing my attention to the lesions present in this case and for data regarding its history and certain examinations prior to February 1937.

Lesions first appeared early in January 1937 and, with minor variations, continued to spread from their edges and to appear at other places until the middle of March. Up to this point, cultures were obtained with relative ease. At this time the horse had lost much in general condition, and an increased corn-ration was fed. Marked improvement followed and, with minor set-backs, continued until the end of June, when the horse was killed; the existent lesions had then healed and new ones ceased to appear. Treatment was not carried out, on account of the spontaneous improvement. Nine different samples of material were examined during the last month, including some from small lesions of a different clinical nature, which had developed later. The results were entirely negative, contrasting strongly with the relative ease with which cultures had been obtained earlier. Material was examined for evidence of ringworm and for acari on four occasions from January to June, always with a negative result.

Typical lesions are shown in the photograph which were taken at the end of March (fig. 1). The earliest lesion consisted of a slightly raised roundish area a little over half a centimetre in diameter, on which the hairs were raised, giving an appearance like the head of a small paint-brush. These tufts could easily be removed, bringing with them the epidermis and leaving a greyish, shining, moist, and slightly cupped area without obvious pus. More advanced lesions were up to 2 cm. in diameter and deeper, and when they were removed a thin layer of pus was disclosed. If the early lesion was removed, a secondary one, covered by a scab, often developed underneath. Lesions at times became confluent. They were confined to the upper layers of the skin and the hair follicles.

Smears from the lesions showed small numbers of organisms arranged singly or, more often, apparently in chains, resembling at first sight chains of heavily encapsulated streptococci. Closer examination showed, however, that these were not streptococci but filaments across which were laid deeply Gram-positive oval elements, sometimes of a dumb-bell shape.

Cultures were easily obtained on serum-agar or blood-agar, or in serum-broth. On serum-agar a heavy shining pale orange-yellow growth was usually produced, which resembled that of a staphylococcus, except that it was at times of very tough

consistence and firmly adherent to the medium. At other times the growth was thinner and greyish, with small, pale-pigmented raised areas. In blood-agar deep colonies produced β -hæmolysis or sometimes a hazy type like that which may be produced by *Staphylococcus aureus*. Colonies increased in size for four days, deep colonies being then up to 2 mm. in diameter and having a markedly fuzzy edge. In serum broth growths occurred in small rounded colonies at the bottom or were attached to the glass at the sides. Growth, on all media, was relatively slow and reached its maximum at three to four days. The fermentation reactions were those of the organism isolated from similar lesions in other countries (see following paper by J. R. Hudson, p. 57).

The morphology in culture varied greatly, particularly with age, and a full description cannot be given here. Some of the characteristic features are shown in the

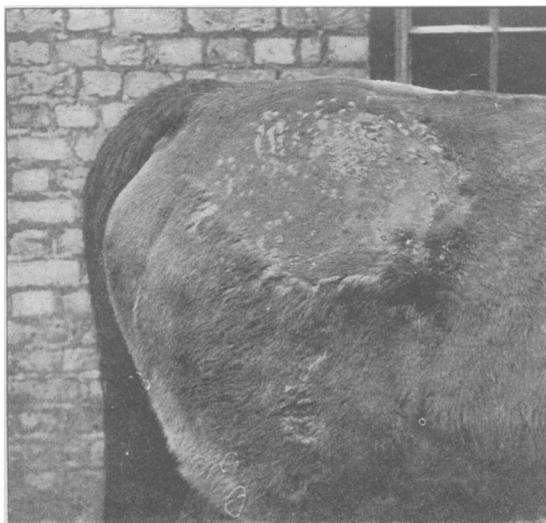


FIG. 1.

photographs (figs. 2 and 3). With pure cultures, there have been seen plain single homogeneously staining filaments, "barred" filaments, multiple filaments or "fingers", and free coccoid elements. One or other form was often predominant. The plain filament is not strongly Gram-positive and does not stain deeply with the usual aniline dyes. As it develops, the older end becomes "barred" and definite oval elements appear in the filament. These stain deeply, are strongly Gram-positive and are laid transversely. They appear to extend laterally until each oval element has a dumb-bell appearance and the older end of the filament appears double. The process may continue until a "finger" is produced having at its growing end a single homogeneously staining filament and at its older end a quadruple filament. At this stage, or earlier, the filament appears to break up transversely. In some observations, made with a warm cabinet (see Hudson, p. 57) the growth of the filaments and subsequent break-up was watched, the double filament breaking eventually into packets each containing four to sixteen coccoid elements. Continued observation of these packets was difficult and further break-up or development of the coccoid elements was not followed up. Appearances strongly suggesting that a filamentous outgrowth from the coccoid elements occurs were seen in stained and unstained preparations. In addition to the forms described, much larger coccoid elements,

arranged singly or in clumps, were at times seen, but it was not possible to decide whether they were part of the normal life-cycle, or degenerate forms.

Rabbits were inoculated with a suspension of triturated material or culture rubbed into the skin of the abdomen, from which the hair had been plucked. After twenty-four hours, the whole area was covered with whitish pustules up to 2 mm. in diameter, and the organism was recovered from these, though with difficulty. After forty-eight hours the lesions had begun to regress but had coalesced in parts where the inoculum was heavy. By the third or fourth day a scab had formed, a part of which had often already fallen off. The lesions described were not produced by similar treatment of rabbits with material from horses affected with skin lesions of other nature. They were also quite different from the typical lesions produced by the streptothrix from bovines or sheep in Kenya from the fourth to the sixth day onwards (*see* Hudson, p. 57).

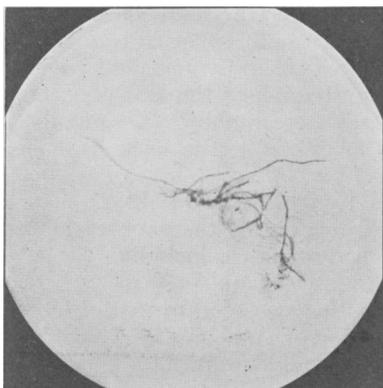


FIG. 2 × 450.

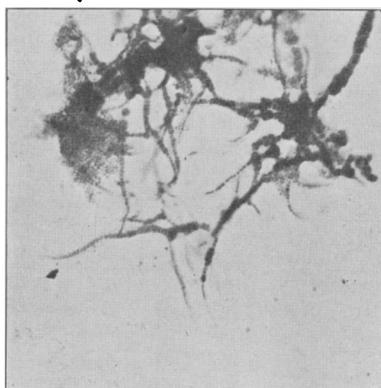


FIG. 3. × 1,000.

Rabbits which had been treated with material from the cases described and had recovered, were inoculated about a month later with cultures, isolated by Hudson, from typical cases of streptothricosis in Kenya, and they developed typical lesions of that condition. No evidence of cross-immunity was present. Vice versa, animals treated with culture from the Kenya condition, which had recovered, were inoculated with culture from the case described and developed the twenty-four to forty-eight hour pustules characteristic of this organism.

The organism recovered from the case described is closely related to those isolated from cases of cutaneous streptothricosis in Africa and from "lumpy wool" in Australia, being similar culturally and in its various morphological characters, but producing a different and characteristic lesion in artificially inoculated rabbits.

Cutaneous Streptothricosis

By J. R. HUDSON

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STREPTOTHRICOSIS has been recognized for about twenty years in British tropical African colonies as a clinical entity. Van Saceghem (1915) described the lesions of the disease, called by him "dermatose contagieuse" or "impetigo contagieux", and also the associated organism, which he named *Dermatophilus congolensis*. In Northern Rhodesia the disease is also called "Senkobo scab".