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CLINICAL COMMUNICATION

Enteritis of a White Rhinoceros Associated with Pseudomonas pyocyanea Infection

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On January 17th, 1949, a white rhinoceros, approximately two months old, found near Tonj in the southern Sudan, was flown to Khartoum, the intention being to rear it for export.

The animal was housed, in isolation, in a mud-built hut, given a plentiful supply of grass bedding and ultimately covered at night with a blanket. The latter precaution was taken because the night temperature in Khartoum (55° F.) was then considerably lower than that in the south (64° F.) and the animal clearly disliked these relatively cold nights.

The diet, consisting of diluted (2:1) boiled cow's milk with an addition of lactose, was given every two hours from 6 a.m. to 8 p.m. by means of a bottle and teat. Orange juice and radio-malt also were given daily.

During the first eight days after its arrival in Khartoum the rhinoceros appeared in good health. It took its food readily and the passage of faeces was normal and regular. The rectal temperature remained almost constant between 100° and 101° F. On the ninth day it started cutting its molar teeth and then resented the introduction of the teat, but in less than 48 hours it was apparently normal again and fed greedily. However, early on the morning of the 29th it was found unable to stand and it died at 8.30 a.m.

At autopsy it was noted that the internal blood vessels were engorged. In the lungs there were a few haemorrhagic infarcts measuring 3 to 4 inches across, and in the liver there were signs of incipient fatty changes. The chief abnormality was confined to the intestines. The whole of the intestinal tract was inflamed and there were one or two haemorrhagic areas in the duodenum; the mesenteric lymph glands were hyperaemic.

Microscopic examinations of the blood and lung infarcts were negative for any form of micro-organism. Wet films of the intestinal contents showed no protozoon parasites but enormous numbers of very actively motile, Gram-negative bacilli. Bacteriological examination of the intestinal contents showed that these bacilli were present in almost pure culture. The organism fermented glucose without gas production but had no action on lactose. On agar it produced a typical diffusible green pigment. It was therefore classified as *Ps. pyocyanea*.

Since this organism was present in the inflamed intestine in virtually pure culture it seems probable that it was the cause of the enteritis and ultimately of death. It would seem likely that the rapid transport from a relatively warm to a relatively cold climate had so lowered the animal's resistance that an organism, perhaps normally a commensal, of mild pathogenicity had been able to proliferate and cause disease.

Summary

A case of enteritis associated with *Ps. pyocyanea* in a young white rhinoceros is described.

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etc., to ensure the feeding and watering of these animals during transit and to prohibit overcrowding and the carriage of unfit animals.

Conveyance of Live Poultry Order.

Provisions are made for conveyance of poultry by sea, road and rail. Crates, etc., must be so constructed and the number of birds they contain must be such as not to cause unnecessary suffering. Exposure to bad weather and excessive heat is prohibited and the crates and birds must be handled in a humane manner. It is illegal to convey birds if unnecessary suffering is caused through infirmity or disease.

The Poultry (Exposure for Sale) Order

This Order prohibits the exposure for sale if, owing to illness, infirmity, injury, fatigue or any other cause, unnecessary suffering is likely to result, and an inspector may order the removal of poultry

ABSTRACTS

[Technique of Direct Blood Transfusions in Large Animals. Coffey, W. M. (1949.) *Vet. Med.* **44.** 113.]

In large-animal practice transfusion of whole blood is valuable in several conditions including shock, haemorrhage, purpuras, anaemias and icterus in foals. Typing seems advisable only in the thoroughbred animal or in the icteric foal, which condition may be due to some Rhesus-like factor when the dam should never be considered as a donor.

Donor and recipient stand side by side. A continuous flow ("Shikles") syringe with 3 ft. 6 in. of tubing on the inlet and outlet connections is flushed with 10 per cent. sodium citrate solution. The needle on the inlet tube is then inserted into the jugular vein of the donor and the apparatus filled with blood to exclude air before commencing the transfusion.

In the icteric foal where large volumes of blood may have to be given it may be necessary to drain blood from its opposite jugular at the same time.

J. A. L.

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[Cobalt and Copper in the Nutrition of Sheep. Marston, H. R. *et al.* (1948.) *J. Agric. Sci.* **38.** 216-228. (1 plate. 3 figs., 3 tables.).]

Part I. Experiments are described which extend the previous work (Marston *et al*) on coast disease of sheep. It was shown that the nutritive quality of the fodder indigenous to the shell-sand littoral of South Australia is limited by the low cobalt and copper content. Over a period of six years a supplement of Co. and Cu. alone prevented coast disease, the animals withstanding three successive pregnancies and producing normal lambs. Initially 2 mg. Co. + 2 mg. Cu. were administered thrice weekly, but after two years the dose of Cu. was increased to the equivalent of 7 mg. Cu./day. There were no observable results from feeding Fe., Mn., Zn., or Ni., as a supplement, indicating that the pastures were able to supply these minerals in adequate amounts.

The untreated animals and those receiving Cu. supplement only showed cobalt deficiency; they declined steadily and died within a year. The symptoms were aplastic anaemia, serous exudate from eyes, greenish hue and fragility of the skin and lethargy.

Those on Co. supplement alone exhibited copper deficiency. The symptoms and time of onset were variable but most died within the second year.

Part II. This experiment was designed to study the degrees of copper deficiency. The first experiment indicated complete depletion of all copper reserves after two years and that 1 mg. Cu./day was insufficient. Administration of supplements was by mouth, by syringe thrice weekly.

(1) The untreated group and those receiving 10 mg. Cu./day developed typical symptoms of cobalt deficiency and most died within a year; (2) those receiving 1 mg. Co. + 10 mg. Cu./day remained healthy; (3) those receiving 1 mg. Co./day developed hypochromic anaemia after 28 weeks, and retardation of growth became progressively worse over the four years. After 2½ years ewes in this group produced ataxic lambs; (4) those receiving 1 mg. Co. + 1 mg. Cu./day had a similar course, but the symptoms were delayed; (5) those with 1 mg. Co. + 5 mg. Cu./day grew well and showed no anaemia, but after two years they showed abnormal keratinisation of the wool as the first symptom of copper deficiency.

P. K.

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[The Effects of Copper Deficiency and of Chronic Over-dosage with Copper in Border-Leicester and Merino Sheep. Marston, H. R., & Lee, H. J. (1948.) *J. Agric. Sci.* **38.** 229-241. (4 plates. 2 figs., 10 tables.).]

The effects of copper deficiency and excess were studied over a period of 3½ years, on pasture deficient in cobalt and copper. Each group received thrice weekly doses equivalent to 1 mg. Co./day. The copper dosage was varied, *viz.*, nil, 1, 5, 50, 100 mg./day.

(1) Those receiving Co. alone showed copper deficiency, *i.e.*, anaemia, loss of weight, the lambs were generally weak and some exhibited ataxia; (2) 1 mg. Cu./day delayed the onset of symptoms, but was insufficient to prevent ataxia occurring in the lambs of ewes after two years on the supplement; (3) the supplement of 5 mg. Cu./day proved sufficient and lambing was uneventful in this group.

The first symptom of copper deficiency is a marked deterioration in the quality of the fleece. The characteristic crimp becomes progressively less distinct and the super-imposition