Salmonellosis in Guinea-Pigs due to the Serotype Weltevreden.

J. R. EGERTON.
Principal Veterinary Officer, D.A.S.F., Port Moresby.
ANITA M. RAMPLING.
Pathologist/Bacteriologist, D.A.S.F., Port Moresby.

THE most common species of the *Salmonella* group associated with disease in guinea-pigs are *Salmonella typhimurium* and *Salmonella enteriditis*, Worden (1947). Buxton (1957) names those two serotypes as the most common in rodents and lists nine other species which have been recovered from guinea-pigs.—S. *blegdam, S. cholerae suis, S. muenchen, S. newport, S. oxford, S. poona, S. reading, S. saintpaul* and *S. worthington*. The purpose of this paper is to describe an outbreak of Salmonellosis due to the serotype *weltevreden* in a laboratory colony of guinea-pigs (*Cavia aperea*) at the Central Veterinary Laboratory, Kila Kila, Port Moresby.

HISTORY.

The guinea-pig colony was established in 1954 with stock imported from Australia. Sporadic losses, probably due to dietary deficiencies, have been experienced since that time. The diet has been a proprietary guinea-pig pellet supplemented by green guinea grass (*Pannicum maximum*) and ascorbic acid in the drinking water. A high proportion of dead guinea-pigs from the colony have always been autopsied and checked for the presence of infectious agents. In July, 1962, a marked increase in the death rate occurred and culture from the majority of these animals yielded a *Salmonella* serotype belonging to Group E of the Kauffman-White scheme.

Over a period of five months the mortality rate from Salmonellosis approached 10 per cent. (17 bacteriologically confirmed deaths from a population of 200 guinea-pigs).

An attempt was made to treat the outbreak by adding antibiotics at a therapeutic level to the drinking water. In vitro sensitivity, tests had shown that the organism was sensitive to streptomycin and slightly sensitive to chloromycetin. Both these drugs were used with little apparent effect on the continuation of the disease.

CLINICAL SIGNS AND POST-MORTEM LESIONS.

Affected guinea-pigs were almost invariably found dead or moribund. There was never any evidence of diarrhoea. The most frequent lesion at necropsy was a greyish purulent peritonitis involving both the visceral and parietal layers of the peritoneum. Abcess formation occurred in the spleen, liver, lungs and mesenteric lymph nodes. Abcesses varied in size from $\frac{1}{4}$ inch to $1\frac{1}{2}$ inches in diameter, and were filled with a granular, rather inspissated and yellowish-brown pus. In one case a splenic abcess had ruptured into the peritoneal cavity. There was rarely any evidence of inflammation of the gastro-intestinal tract.

BACTERIOLOGY.

A Salmonella serotype later identified as *S. weltevreden* was isolated from all animals showing any of the lesions described above. *S. weltevreden* has the following characteristics :—

Cultural characteristics.

Growth occurs readily on nutrient agar. Colonies at 24 hours are 2-3 mm. in diameter, circular with a regular outline, slightly convex and translucent. The organism is motile.

Biochemical Properties.

The biochemical characteristics are typical of the *Salmonella* genus.

Indole—not produced.

Methyl red reaction—positive.

Voges Prosgauer—negative.

Citrate utilization—positive.

Hydrogen sulphide production—positive.

Urea hydrolysis—negative.

The following " sugars " are fermented within 24 hours with the production of acid and gas :—glucose, maltose, dulcitol, mannitol, arabinose, xylose, rhamnose and mannose. Inositol is fermented at 14 days incubation. Neither acid nor gas are produced from the following reagents :—salicin, lactose, sucrose and adonitol.

Serology.

S. weltevreden belongs to Group E of the Kauffman-White classification and has the serological formula O,3.10:H,r,z6. Serological typing was carried out at the Bacteriological Research Department of the Commonwealth Serum Laboratories, Melbourne.

DISCUSSION.

The recovery of *S. weltevreden* from the guinea-pig colony at Kila Kila is the only record of the isolation of this serotype since its identification by Erber (1941). In that instance *S. weltevreden* was isolated from the faeces of four cases of gastro-enteritis in man in which the author considered the organism to have etiological significance. The cases occurred in Batavia in the then Dutch East Indies. A further strain of *S. weltevreden* was isolated by Erber from a guinea-pig following innoculation of material from a dead house rat.

Salmonellosis is a relatively common disease in guinea-pigs but had not occurred in this colony previously. The signs most commonly reported in affected animals are diarrhoea and wasting. At necropsy the predominant sign is gastro-enteritis. The type of disease caused by *S. weltevreden* is quite different in that it is characterized by abcess formation in the viscera. It is probable that, following ingestion, the organism causes an asymptomatic gastro-enteritis then a bacteraemia occurs which results in localization of bacteria in organs such as spleen, liver and lungs.

The source of infection at Kila Kila was not established. Possible carriers included rats and lizards. Twenty each of rats and lizards about the station were caught and examined for *S. weltevreden* with negative results.

Treatment of the outbreak with antibiotics having failed, it was decided to depopulate the colony as extensively as possible. It had been noted that sera of animals dying with Salmonellosis agglutinated the causative organism using a slide test. Six females and two males selected at random from the colony and which gave negative slide tests were retained and the rest of the colony destroyed. The retained animals were placed in rodent proof enclosures and breeding commenced. No further cases of Salmonellosis have occurred in the three months since that time.

SUMMARY.

The isolation of *Salmonella weltevreden* from a new host, the guinea-pig, is reported.

The unusual disease resulting from the infection in guinea-pigs is discussed.

ACKNOWLEDGEMENT.

The authors are grateful for the assistance of Dr. J. Gulasekharam, Commonwealth Serum Laboratories, Melbourne, in the serological typing of *S. weltevreden.*

(Received May, 1963.)

REFERENCES.

BUXTON, A. (1957). *Salmonellosis in Animals.* Review series No. 5 of the Commonwealth Bureau of Animal Health. Commonwealth Ag. Bureaux, Farnham Royal, England, p. 54.

ERBER, M. (1941). *Geneesk. Tijdschr.* Ned-Ind. 81 : 2123.

HUGHES, D. L. (1947). *Care and Management of Laboratory Animals. U.F.A.W. Handbook.* Edited by A. N. Wordern. Bailliere, Tindall and Cox, London, p. 105.