

# NOTES

## Observations on Parasites of Domestic Animals in Micronesia

AS A PART OF THE MICRONESIAN EXPEDITION of the University of Hawaii in the summer of 1946, observations were made by the writer on parasitic diseases of man and of some of the important economic animals on the islands of Ponape and Guam, and on Moen (Truk archipelago). Brief reports have already been published by the writer on observations of parasites of man (*Jour. Parasitol.* 32: 12-13, 1946) and on murine leptospirosis (*Science* 105: 236, 1947). The present note summarizes some of the observations made on parasites taken mostly from domestic animals.

*Parasites of Cattle.* Many skin lesions associated with extensive tick infestation were noted on 12 cows examined in the Net and U districts of Ponape. The ticks have been identified as *Boophilus annulatus australis* (Fuller), carriers of bovine piroplasmiasis or "Texas fever." Reports (*Civil Affairs Handbook, Office Chief Naval Operations U. S. Navy, OPNAV P22-5*, p. 129, 1944) indicate that on Ponape many cattle have in the past died of this disease. The examination of the feces of six of the above-mentioned cows failed to reveal presence of liver fluke eggs. A verbal report from Mr. Oliver Nampei, resident of the island, indicated that liver flukes had been noted in cattle on Ponape. A search by the writer in several fresh-water streams in the Net and U districts for lymnaeid snails, known carriers of liver flukes, yielded negative findings.

The examination of one bull near Agaña, Guam, revealed a moderate infestation of ticks identified as *Boophilus annulatus australis* (Fuller) and *Amblyomma cyprium* Neumann. Liver flukes, *Fasciola hepatica* Linn., are known to occur in cattle on Guam. The identification was made by the writer in 1940 from specimens submitted by Mr. A. I. Cruz of the Guam Department of Agriculture. The intermediate host for these flukes on Guam is believed to be the fresh-water snails *Fossaria ollula* (Gould), which were collected by the writer in a swampy urea near Agaña. This snail has been experimentally proved to be a suitable carrier for

*F. hepatica* (*Hawaii Agr. Expt. Sta. Rpt.* 1946: 99, 1947).

*Parasites of Swine.* On the island of Ponape, the post-mortem examination of a pig, approximately 1½ years old, revealed several immature kidney worms, *Stephanurus dentatus* Diesing, within nodules in the mesenteric and perirenal fat. The liver of the pig showed considerable discoloration and fibrosis, conditions commonly seen in kidney-worm infection caused by the young migrating worms. The large intestine of the animal also showed a moderate infection of nodular worms, *Oesophagostomum dentatum* (Rudolphi).

On the island of Guam, two pigs, butchered at the slaughterhouse of the U. S. Commercial Company, showed infections of lungworms, *Metastrongylus elongatus* (Dujardin), and nodular worms, *Oesophagostomum dentatum* (Rudolphi). In addition, one of the pigs harbored a moderate infection of kidney worms, *Stephanurus dentatus* Diesing. The liver of the pig showed many white spots and young kidney worms. The butcher at the slaughterhouse stated that in his estimation about 50 per cent of the hogs slaughtered there showed similar kidney-worm lesions.

The limited observations made on Guam and Ponape indicate that kidney-worm infection in pigs may be widespread in Micronesia. Kidney worms produce serious damage to pigs, and therefore represent a group of parasites of considerable economic interest. Since the natives depend on swine as one of the major sources of animal protein, it is desirable that proper measures be taken to control this parasite. A method which has been suggested by the U. S. Department of Agriculture (*Farmers Bul.* 1787) for kidney-worm control in the southern states consists in raising pigs on pastures surrounded by a dry, bare area which allows the action of the sun to destroy the developing eggs and larvae of the parasite. This method does not appear adequate for many areas of Micronesia where rainfall is common and the sky is cloudy or overcast more than three-fourths of the time. It appears

that the pasture rotation system might prove more suitable for Micronesia. In addition, young pigs should be raised on sheltered, dry or concrete floors and after weaning kept away from older hogs on places that have not been used by older hogs. To prevent the spread or increase in the incidence of the infection, it is important that infected hogs are not shipped to new areas. Piglets to be shipped to new localities should come from litters that have been raised on concrete floors or dry areas.

*Parasites of Chickens.* On the island of Ponape the following parasites were found in four adult chickens: (1) proventricular roundworms, *Tetrameres* sp.; (2) cecal worms, *Heterakis* spp. (probably *H. gallinae* (Gmelin) and *H. lingnanensis* Li); (3) tapeworms, *Amoebotaenia* sp. (probably *A. sphenoides* (Railliet)) and *Raillietina* sp. (probably *R. echinobothrida* (Megnin)); (4) lice, *Lipeurus caponis* (Linn.), *Menopon gallinae* (Linn.), and *Oxylipeurus angularis* Peters; (5) mites, *Pterolichus obtusus* Robin and *Megninia cubitalis* (Megnin). The chicken mite, *M. cubitalis*, was also collected from several chickens on the island of Guam.

*Parasites of Dogs.* Post-mortem examination was made on one dog on Ponape. The small

intestine of this animal showed extensive inflammation associated with a large number of hookworms, *Ancylostoma caninum* Ercolani. A few tapeworms, identified as *Dipylidium* sp., were also found in the small intestine. The dog also showed a light infestation of fleas, *Ctenocephalides felis* (Bouché).

*Parasites of Rats.* Several mites, *Laelaps echidninum* Berlese, were collected from a few rats trapped on Ponape. No fleas were found on 18 rats which were examined. Of the kidneys of 22 rats trapped on Moen and 18 rats from Ponape, 3 and 2, respectively, showed, in stained sections, presence of leptospirae morphologically identical to those of *Leptospira icterohaemorrhagiae* (Inada and Ido).

The writer wishes to acknowledge the assistance of individuals who identified some of the parasites reported above, as follows: ticks from cattle, C. N. Smith; roundworms and tapeworms of chickens, E. E. Wehr; lice from chickens, C. F. W. Muesebeck and E. W. Stafford; mites from chickens, E. W. Baker; fleas from a dog and mites from rodents, C. E. Pemberton; lymnaeid snails from Guam, H. A. Rehder.—Joseph E. Alicata, University of Hawaii Agricultural Experiment Station, Honolulu, Hawaii.

## Laysan Albatross Nesting on Moku Manu Islet, off Oahu, T. H.

ON FEBRUARY 23, 1947, a young albatross was found among the Red-footed Boobies (*Sula s. rubripes*) and Sooty Terns (*Sterna f. oahuensis*) nesting on Moku Manu, which is approximately three-fourths of a mile off Mokapu Peninsula on the northeastern side of Oahu. At this time the bird was covered with down and identification was impossible. By May 10 the young bird had assumed the characteristics of a young *Diomedea immutabilis*, and on July 12, when the picture was made, there could be little doubt of its identity. On July 29 the bird could not be found. Presumably it had left the island, as do the young at this season on other islands. This is the first recorded instance of the Laysan Albatross nesting in the eastern end of the Hawaiian archipelago. Its most easterly nesting ground has heretofore been thought to be the Bird Islands, east of Necker Island in the Hawaiian Islands and some 400 miles to the northwest of Moku Manu.

Although successive trips were made to the nest site on March 20, April 19, May 10, 17, 31, June 14, July 12 and 29, 1947, adult albatrosses were never observed on the island. A single

adult *Diomedea immutabilis* was observed May 31 resting on the water just outside the reef at Kaneohe Bay, some 3 miles from Moku Manu. On June 14 another adult was observed flying above Mokulua Islet, off Lanikai, Oahu. These are the first inshore records of the Laysan Albatross in the waters surrounding the eastern end of the Hawaiian chain.—Harvey I. Fisher, Department of Zoology and Entomology, University of Hawaii, Honolulu, Hawaii.

