of guinea-fowl chicks occurred where birds were housed directly beneath a loft containing baled hay. The hay was found to be heavily infested with the following species of mites: *T. longior*, *K. plumosus*, *K. plumigera* (Oud.), *Glycyphagus destructor* (Schrank) and *Acarus farris* (Oud.)—mainly hypopi. Veterinary examination did not indicate any specific disease to be responsible for the death of birds, which amounted to about seven hundred out of a total of two thousand chickens. All deaths occurred when the chicks were about 14 days old, and over a period of 2–3 days. It was found that the mites were "raining down" on to the chicks from the loft. Although guinea-fowl are hardy and easy to rear they are very nervous, and the number of mites present was considered to be responsible for affecting the behaviour of the chicks. Excessive overcrowding, with birds three to four deep, caused suffocation under the brooders, where the birds congregated as a result of the mites constantly present without brooder cover.

It is rare for poultry to be housed under the conditions described, but following the removal of the chicks from the mite-infested area all deaths ceased within 48 h, and subsequent behaviour appeared to be normal. So far as guinea-fowl are concerned the observations suggest that where substantial numbers of non-parasitic mites cover the body, the irritation caused influences behaviour with serious consequences.

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Intestinal Tumours in the German Cockroach *Blattella germanica* L.

NATURALLY occurring tumours are extremely rare in insects. Harker[1] in her review reports that, except for those in *Drosophila*, only two have been described during the past 25 years. Tumours can, however, be induced in cockroaches by cutting the nerves[2,3], by repeated implantation of suboesophageal ganglia which are out of phase[4], and by ligature of the salivary ducts[5]. We have tried to induce tumours experimentally in the German cockroach, and discovered that naturally occurring tumours (those occurring without known causes) were very frequent in our colony of the insect. If the recurrent nerve, which innervates the anterior parts of the intestine and the salivary organs, was severed, there was no effect on tumour frequency in our experiments on *Blattella germanica*. Similar results were obtained in the American cockroach, *Periplaneta americana*, after severance of the recurrent nerve[5]. We were therefore able to treat all our material as a single unit. Fig. 1 shows diagrammatically the distribution and frequency of tumours in the salivary organs and the intestines of a total of 246 individuals of *Blattella germanica*. This shows that tumours were found mostly in the ectodermal parts of the intestinal tracts and especially in the rectal parts. Tumour frequency increased with the age of the host and 96 per cent of older males were tumorous. Females from the same age groups were less susceptible than the males.

These tumours had the histological characteristics of intestinal tumours of insects[6]; spindle shaped cells often formed whorl-like structures. They were sometimes so large as almost to block the passage of the intestine, but at present we do not know if there is any mortality caused by these tumours, or whether they form metastases.

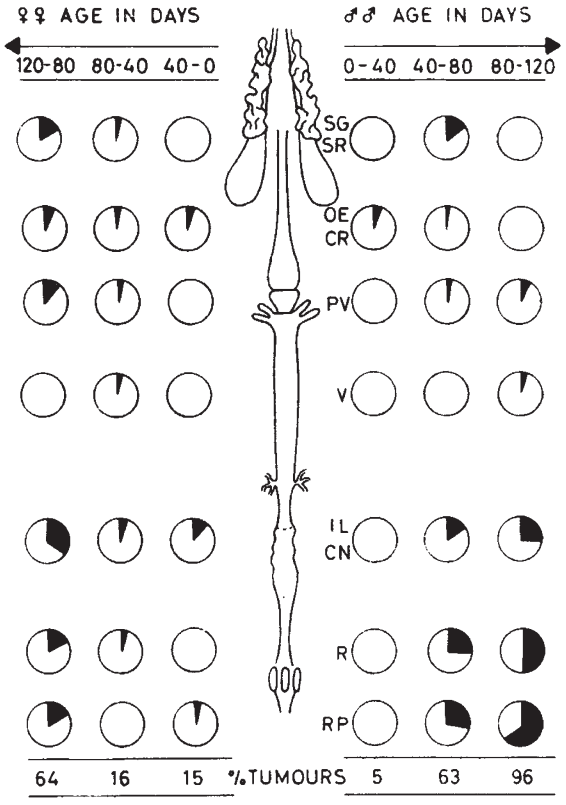

Fig. 1. Diagrammatic representation of the distribution and frequency of tumours (black sections) in the intestine and salivary organs of *Blattella germanica*. *CN*, Colon; *CR*, crop; *IL*, ileum; *OE*, oesophagus; *PV*, proventriculus; *R*, rectum; *RP*, rectal pads; *SG*, salivary gland; *SR*, salivary reservoir; *V*, ventriculus.

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IMMUNOLOGY

Microglobulin synthesized in Cell Culture of the Lymph Nodes and Spleen of the Rabbit

THE proteins synthesized *in vitro* by lymphoid tissues of immunized animals are known to consist of an antibody fraction and a gamma-globulin fraction which cannot be identified as an antibody[1]. Even in hyper-immune rabbits, the amount of newly formed antibody will not exceed 40 per cent of the total gamma-globulin synthesized[2]. This investigation is concerned with the size of the molecules of the non-specific gamma-globulin synthesized in cultures of rabbit lymphoid cells.

On the fourth day after a booster dose of human serum albumin (HSA), the spleen and lymph nodes were removed, the tissue minced, the suspension passed through a 'Capron' mesh and the cells cultivated in a special camera[3,4]. A carbon-14 hydrolysate of *Chlorella* protein was introduced into the medium as a source of radio-

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