and uncouple genitalia. For about another 30 min the male accompanies the female in the mounted position while she oviposits. When the male unmounts, the female flies away immediately.

The *Scatophaga* male holds the female by anchoring the tarsal claws of his forelegs into the pleural membrane at the base of her abdomen, and the femoro-tibial joint of each of his forelegs is tightly flexed over her thorax; his two hind pairs of legs remain on the substrate. Thus when the pair uncouples genitalia, the male remains holding the female's waist, allowing her maximum independent movement during oviposition.

Although unpaired males are not as responsive to ovipositing females with attendant males as they are to unpaired females, unpaired males occasionally attack couples, attempting to copulate with preoccupied females. The paired male responds to this aggression with one or both of two distinct actions: (*a*) one middle leg is thrust out in the direction of the aggressor, or both middle legs are raised, pushing him away, or (*b*) both forelegs are extended so that the paired male rears upward and backward, throwing the aggressor off. These actions usually prevent the aggressor from contacting the female. In less than 5 per cent of such encounters the aggressor succeeds in gaining a hold on the female, and the ensuing struggle often attracts other males, so that a mass of males is soon tearing at her. If the paired male is forced to relinquish his hold, another will take his place; then copulation occurs again and the new partners fly back to the vegetation. In observations of hundreds of ovipositing pairs, I have seen this last phenomenon only twice.

A new copulation with a different male can also occur in the rare instance when an ovipositing female does not leave the pat immediately after the protective male unmounts. I have seen a female ovipositing alone only once, and she was hidden deeply in the grass at the edge of the pat. It seems evident, then, that the male *Scatophaga* performs a vital role in assuring the deposition of eggs by the female.

Males of *Saltella* and *Copromyza* appear to protect females in the same manner as *Scatophaga*, but the reproductive activity of each of these three species is separated temporally or spatially. Other coprophilic Diptera probably also exhibit male–female co-operation, for in Denmark Hammer[1] has observed that *Sepsis cynipsea* (L.) (Sepsidae) and various Sphaeroceridae, as well as *Scatophaga*, remain paired during the oviposition period. With the exception of uninterpreted observations by Hammer[1], protective post-copulatory alliances among the Diptera have not been reported previously. The special case of a short-term pair bond in the coprophilic Diptera resolves the conflict between coincident mating and ovipositing activities, but probably does not represent a significant step toward sociality, for the position of the male is only an extension of the copulatory position, and the raising of the middle legs is a common reaction to intruders, occurring not only in unpaired *Scatophaga* of both sexes in confinement, but in many flies. But the mounted position itself and the exaggerated foreleg extension appear to have developed especially for male protection of the ovipositing female.

This investigation was supported in part by a US Public Health Service fellowship from the National Institute of General Medical Sciences and by a Public Health Service grant from the Division of Environmental Engineering and Food Protection.

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Received October 17, 1966.

[1] Hammer, O., *Dansk Naturhistorisk Forening*, Copenhagen, 105, 143 (1943).
[2] Thomas, H. T., *Proc. Roy. Entomol. Soc.*, Series A, 25, 93 (1950).

MICROBIOLOGY

Lack of Oncogenic Effect of the *H*-Viruses for Hamsters

BECAUSE the H^1 and RV^2 viruses are somewhat similar in size to members of the oncogenic papova group, there has been considerable speculation about whether they, too, might have an oncogenic property. Toolan[1] first reported that *H*-1 virus had not produced tumours in a small group of aged "mongoloid-type" hamsters injected at birth with *H*-1. Later, Kilham and Maloney[3] noted that neoplasms had not been found in any of the species inoculated with *RV* when newborn, except for a few benign odontogenic tumours.

I have just completed a survey of 2,000 hamsters kept in the laboratory until they died at 2–3 years of old age. All the animals had been obtained from the Lakeview Hamster Colony, Newfield, New Jersey. The "mongoloid" animals had been injected with *H*-1 at birth except for a few that had received *H*-3. Four tumours were found in 1,729 of the deformed animals (Table 1). Two of the neoplasms were lymphosarcomata, one a hepatoma, and the fourth an angiosarcoma of the liver. The thirteen tumours found in the 259 control hamsters were quite varied. The list included two melanomata, two reticulum cell sarcomata, two adrenal carcinomata, and one each of an ovarian carcinoma, a lymphosarcoma, a papillary adenocarcinoma of unknown origin, a leiomyosarcoma of the bladder, a myxosarcoma, an epidermoid papilloma and a hepatoma.

Table 1. INCIDENCE OF TUMOURS IN AGED "MONGOLOID" HAMSTERS INJECTED AT BIRTH WITH *H*-1 OR *H*-3

	No. of animals	No. of tumours	Incidence	Sex of tumour-bearing animals
Mongoloid	1,729	4	0·0023	3♂, 1♀
Control	259	13	0·05	6♂, 7♀

The 5 per cent tumour incidence found in the control hamsters is more than twenty times the tumour incidence observed in the mongoloid animals. It is possible that the deformed and dwarfed animals were not ideal nutritional hosts for neoplastic growths. In any case, it is apparent that the *H*-viruses were not oncogenic for these hosts.

This work was supported by a grant from the American Cancer Society and the National Cancer Institute, National Institutes of Health, US Public Health Service.

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Received November 18, 1966.

[1] Toolan, H. W., *Bull. N.Y. Acad. Sci.*, 37, 305 (1961).
[2] Kilham, L., *Virology*, 13, 141 (1961).
[3] Kilham, L., and Maloney, J. B., *J. Nat. Cancer Inst.*, 32, 523 (1964).

Proliferation of *Mycobacterium tuberculosis* from Mouse Lung Tissue on Various Carbon Sources

THERE has been increasing interest in various biochemical differences between tubercle bacilli grown *in vitro* and those recovered from lung tissue of infected mice. During investigations of enzyme and metabolic changes in the *H37Rv* strain of *Mycobacterium tuberculosis* after transfer of bacilli from *in vivo* to *in vitro* conditions and vice versa, the proliferation of tubercle bacilli from isolated mice lung tissue (*LH37Rv*) was observed in defined culture media which differed in their source of carbon.