the establishment of aseptic colonies of *Eurycotis floridana*: but on attempting to apply it to *Blatta orientalis* no oothecæ have been found to hatch. Presumably the sterilizing media can penetrate the oothecal capsule in this species and cause the death of the developing young.

It is recognized that the procedure described may have a disadvantage for some types of nutritional study in that the insect consumes an undetermined amount of solid material in using the agar gel as a source of water. On the other hand, the solid experimental diet is consumed at an undiminished rate as compared with more conventional feeding conditions and the method is particularly suitable for studies of the metabolic fate of specific dietary constituents. The results of these metabolic experiments will be reported in detail elsewhere.

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Blood-feeding Habits of Adult Noctuidae (Lepidoptera) in Cambodia

PREVIOUS observations on feeding habits of the genus *Arcyophora* were summarized by Reid[1]. Only in African territories adult moths were found feeding nocturnally on the lachrymal secretions of cattle, horses, mules, donkeys and wounded antelopes. One particular observation was made by Neave (quoted by Reid[1]) in South Africa, where many moths were sucking fluid, but no blood, from the eyes of a wounded animal.

During a recent assignment in Cambodia, entomological night collecting was carried out which led to the discovery of the blood-feeding habits of *Lobocraspis griseifusa* Hmpsn. Another less-common species, namely *Arcyophora silvatica* sp. nov. was associated with *L. griseifusa*.

In order to obtain direct evidence of blood meals taken by the moths, dissections of stomach contents were carried out at Kbal Trach (near Snoul, Cambodia) in the night of June 29-30, 1958. In a first series of 8 females of *L. griseifusa* collected early in the evening from water buffaloes, no blood-feeding but only watery fluid was found. In a second series, two specimens were found with traces of blood which were used for microscopic slides stained by the J.S.B. staining technique. The examination revealed the presence of red blood corpuscles in an advanced stage of digestion. Further 15 samples were obtained from the digestive system of males and females of *L. griseifusa* and used for precipitin tests at other occasions. In these cases they were found to be positive for bovines.

So far as the observations on *L. griseifusa* and *Arcyophora silvatica* are concerned, very little irritation seems to be caused on their hosts by these insects. While feeding, the proboscis of the moth is inserted between the lid and cornea of the eye and feeding extends over several minutes. Investigations on the possible role as vectors of contagious bovine diseases are indicated. A more detailed account of these results will be published elsewhere in due course.

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MICROBIOLOGY

Effects of Deuterium Oxide on the Synthesis of *T5* and *T7* Bacteriophages

EARLY experiments on the biological effects of deuterium oxide indicated that the substitution of the pure substance for water resulted in cessation of growth in such diverse biological entities as tobacco seeds[1], flatworms[2], and mice[3]. When there was partial substitution of water by heavy water, growth was merely retarded. This retardation was attributed to an isotope effect resulting in lowered rates of reactions involving deuterium as compared to hydrogen[4]. The inhibition of tumour growth in animals the body water of which contained appreciable amounts of deuterium[2,6] is another striking example of an isotope effect in which retardation of a biological reaction has been observed. Similar isotope effects have been observed in photochemical reactions[4] as well as in yeast fermentation[7].

Cells of *Escherichia coli*, strain *B*, were raised in double-strength nutrient broth containing 0·5 per cent sodium chloride and 0·001 *M* calcium chloride. Deuterated medium was prepared by mixing equal volumes of a nutrient broth concentrate and 99·74 per cent pure heavy water. One-step growth-curves of the bacteriophages were performed by an established technique[8]. The exposure of infected cells to heavy water was accomplished by rapidly diluting the cells in deuterated medium after the adsorption period. The adsorption period was 10 min. with *T5* and one minute with *T7*.

As seen in Table 1, the addition of various amounts of heavy water to growth media caused marked effects on the lag period and the mass doubling time of the bacteria. Cells grown in 50 per cent heavy water appeared larger than did water-grown cells; and by 18 hr. many of the cells grown in heavy water were long and filamentous.

The effects of heavy water on the burst sizes of *T5* and *T7* bacteriophages are shown in Table 2. Heavy water present during the latent period decreased the burst size with *T5* but had no significant

Table 1. THE EFFECT OF D_2O ON THE GROWTH OF *E. coli*, STRAIN B

Per cent D_2O in growth medium	Time (minutes) Lag	Mass doubling time	Final population (Per cent of control)
none	30	30	100
10	60	33	100
25	60	40	96
50	60	60	92

Table 2. EFFECTS OF HEAVY WATER ON THE BURST SIZES OF *T5* AND *T7* BACTERIOPHAGES

Heavy water in growth medium (%)	Heavy water in medium during latent period (%)	Burst Size* *T5*	*T7*
0	0	100	100
0	50	50 ($P=0·1$)	124 ($P=0·9$)
50	0	76 ($P=0·2$)	199 ($P=0·1$)
50	50	102 ($P=0·9$)	134 ($P=0·02$)

* Values expressed as per cent of control, water-grown infected cells exposed to water during the latent period. The average burst for *T5* was 226 and for *T7*, 209.