

posed to massive infestation by the miracidia of *F. hepatica*, freshly hatched from laboratory incubated eggs, the technique of snail infection being the same as that employed at the Laboratory for the infection of *L. truncatula*.

Examination of 101 of the experimental snails showed that 13 had become infected. Ten of these 13 were dissected before the developmental cycle of the fluke had been completed, two died soon after commencing to shed cercariae; but from the third, 99 perfect cercariae emerged, including 86 which left the snail within a 24-hr. period, 113 days after the date of infection. Four of these cercariae were pipetted into the mouth of a rabbit, and in six weeks time one half-grown specimen of *F. hepatica* was recovered from the bile ducts.

Attempts to infect adult specimens of *L. stagnalis* have so far failed, and it is interesting to note that the report of Nöller and Sprehn² of partial success with that species, and the report of Thomas¹ of partial success with *L. pereger*, also referred to young specimens. It appears, therefore, that immature specimens are more susceptible than are adults.

Although of biological interest, this observation may have little significance from the veterinary point of view on account of the definitely aquatic habit of *L. stagnalis*, which appears to be confined to permanent water. It shows the possibility, however, of the maintenance of liver-fluke infestation in environments from which *L. truncatula* is absent, and suggests that immature specimens of yet other species of *Lymnaea* may also serve as vectors. The investigation of these possibilities is proceeding at Weybridge, and partial development of the fluke in *L. pereger* and *L. palustris* has already been observed.

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¹ Thomas, A. P., *J. Roy. Agric. Soc.*, ii, 19, 276 (1883).

² Nöller, W., and Sprehn, K., *Berl. tierärztl. Wschr.*, 40, 369 (192)

Symptomatology of Virus Diseases Induced in Cacao by '2-4,D' Treatment

DURING the treatment with commercial '2-4,D' emulsions of small blocks of cacao (*Theobroma cacao*) for weeding, in Venezuela, a peculiar phenomenon was observed incidentally. Basal shoots ('chupons') react to the treatment with distortion and malformation, then dropping of young leaves. A few scattered leaves developed from buds were wrinkled, more or less curled up to rolled, hardened and rugose or smooth, and more or less ruffled. The size of leaves was frequently reduced, chiefly as regards width in relation to the length. A number of leaves were mottled or even chlorotic, but also vein-banded or with red-stained veins; others were healthy and normal.

The symptomatology is that of one or two or sometimes even more virus diseases, in the same tree, as previously described in Trinidad by Posnette¹, and in the Dominican Republic and Colombia by Ciferri². Of course, the next new flush of foliage consisted of healthy leaves.

The same effect induced by treatments with '2-4,D' has been observed in Italy on the vine

(*Vitis vinifera*) by Baldacci and Topi³, with symptomatology resembling 'courtnoué' or 'roncet'.

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¹ Posnette, F. A., *Trop. Agric.*, 21 (6), 105 (1944). Posnette, F. A., and Palma, M., *ibid.*, (7) 130 (1944).

² Ciferri, R., *Bol. Est. Nac. Agr. Moca*, B. Bot., 16, 108 (1929); *Rev. Fac. Nac. Agron. Medellin*, 8 (29/30), 79 (1948).

³ Baldacci, E., and Topi, M. (in the press).

Nutritional Requirements of *Drosophila*

SINCE our earlier publication¹, the following additional information has been obtained about the nutritional requirements of *Drosophila melanogaster*. Addition of 25 γ thymine per culture to the basal medium leads to accelerated development, pupae being formed seven days after egg-laying. This represents a decrease in developmental time of one day at least over controls without thymine. Further acceleration can be obtained by addition of 20 mgm. of a yeast fraction prepared by treating yeast with hot 2 per cent sodium bicarbonate, filtering, rendering slightly acid with hydrochloric acid, and precipitating the fraction with an excess of ethanol. Pupation can then ensue five days after oviposition. That the active fraction is not nucleic acid as supplied commercially is shown by the fact that parallel cultures without the fraction, but containing additional nucleic acid, do not show the same effect.

There is also some evidence that the basal medium as constituted at present may be deficient in some specific amino-acid. This is suggested by the fact that the addition of globin (prepared from hæmoglobin by hydrochloric acid hydrolysis and salting out) gave pupae of much larger size than those obtained from the normal basal medium. This possibility is now being followed up.

For convenience, the composition of the basal medium as now constituted is given below.

	gm.		gamma
Casein (vitamin-free)	0.06	Aneurin hydrochloride	4
Gelatin (reprecipitated)	0.045	Riboflavine	6
<i>dl</i> -Tryptophane	0.005	Nicotinic acid	12
Ergosterol	0.005	Pyridoxin	12
Cholesterol	0.005	Biotin	0.2
Dextrose	0.1	Calcium- <i>d</i> -pantothenate	1500
Agar	0.1	Thymine	25
Yeast nucleic acid	0.0034	Inositol	12
Tatum salt mixture (1936)	0.006	Folic acid	2
Water to 5 ml.		Choline chloride	1000
		(<i>p</i> -amino-benzoic acid)	25

Full details will be published elsewhere.

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¹ Begg and Robertson, *Nature*, 161, 769 (1948).

Pregnancy Test using Male Anura

CONFIRMING the validity of the Galli-Mainini test for pregnancy in the male toad *Bufo arenarum*¹ and referring to the suitability of *B. marinus*² and *Rana pipiens*³, Haines⁴ raises the question of the possible suitability of two European species, *B. bufo* and *R. temporaria*. We have demonstrated⁵ the suitability of a European frog, *R. esculenta*; and on a theoretical basis we have assumed that the Galli-Mainini test must be common to the Anura (toads and frogs).