such preparations may prove a convenient means of comparing the assimilatory capacity of the flag leaves and ears of different varieties and species of cereals. In addition they may prove a useful research tool in other subjects of physiological interest such as grain dormancy, the mineral requirements and water relations of the cereal ear and biochemical factors determining quality factors in wheat grains.

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ENTOMOLOGY

Danger of Spraying Wooden Insect Cages with Melamine Resins

The original cages used by us for rearing *Glossina austeni* were made of deal (coniferous softwood) by the local carpenter; the wood was left untreated. A precision wood-working firm was commissioned to make similar cages in large numbers. On their advice, mahogany plywood, exterior grade, was used, and the cages surface-sprayed with a melamine resin which would seal the wood against absorption of fæces and facilitate the washing of dirty boxes.

Twenty new, melamine-sprayed cages were first kept for three days in a room at 33° C so as to expel any residual solvent. Batches of about 25, 4-day-old, newly fertilized females were housed alternately in melamine-sprayed or deal cages; survival rates were recorded at days 14, 30 and 60 after fertilization (Table 1).

Table 1. Toxicity of Melamine Resins

A comparison of survival rates among female *G. austeni* at days 14, 30 and 60 after mating when 3–4 days old

Cage type	Total No. of flies	Day 14 No. survived	Day 14 Survival %	Day 30 No. survived	Day 30 Survival %	Day 60 No. survived	Day 60 Survival %
Untreated deal cages	484	390	81	310	64	198	41
Melamine-sprayed plywood cages	476	363	76	262	55	140	29

The survival rate was lower in the new, melamine-sprayed cages, and, further, the differences at each age became progressively greater at 5, 9 and 12 per cent, suggesting that the melamine resin has slow-acting toxic properties. The difference at day 14 is not significant ($\chi^2 = 2{\cdot}65$; $0{\cdot}2 > P > 0{\cdot}1$). The difference at day 30 is significant ($\chi^2 = 8{\cdot}1$; $P < 0{\cdot}01$), as is the difference at day 60 ($\chi^2 = 13{\cdot}9$; $P < 0{\cdot}001$).

Melamine resin is a condensation product of melamine and formaldehyde, so presumably the formaldehyde is the toxic component. Since all surfaces of the mahogany plywood had been thoroughly sprayed with melamine resin, there can be no question of harmful emanations from either the mahogany or the bonding material used in plywood construction.

Since phenol-formaldehyde resins are now used as the bonding agent for plywood, a small test was undertaken to see if survival in untreated mahogany plywood boxes is worse than in deal boxes. The results suggest that survival is worse in the mahogany plywood boxes for the first seven weeks after manufacture, but not thereafter, whereas the melamine-sprayed cages are still toxic after 10 weeks.

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Effects of Brain and Corpus Cardiacum Extracts on Hæmolymph Trehalose of the Cockroach, *Periplaneta americana*

The first report relating hormonal factors in insects to the regulation of a particular hæmolymph sugar was that of Steele[1]. He demonstrated that saline extracts of the corpus cardiacum of the cockroach *Periplaneta americana* (L.) cause about a 100 per cent increase in hæmolymph trehalose within 1 h after injection and the effect persists for several hours. The level of reducing sugar (glucose?) was generally lowered in these animals. Later, Steele reported that the extract accelerated the release of inorganic phosphate and that as hæmolymph trehalose was elevated fat-body glycogen declined[2]. Nerve cord glycogen also declined, but gut and muscle glycogen were unaffected. The interpretation is that the hormone appears to increase the activity of phosphorylase and produces a glycogenolic effect. More recently Bowers and Friedman[3] reported finding that in the South American cockroach, *Blaberus discoidalis* (Serville), administration of aqueous extracts of the corpus cardiacum significantly elevate both trehalose and glucose in the hæmolymph. They also found a decrease in fat-body glycogen 5 h after injection and extracts of the corpus allatum were also tested and found to be without effect. They note also that animals with heads tied off respond to the active extract, indicating that the effect is not mediated through other cephalic glandular material.

We wish to report here our observations which generally confirm and supplement these reports. A portion of this work has been briefly reported on elsewhere[4]. Adult male and female cockroaches, *Periplaneta americana* (L.), were examined. Tissue extracts were prepared from cockroaches that were rapidly anæsthetized by carbon dioxide gas and then chilled. The heads were removed and dissected in cold Hoyle's solution[5]. The corpus allatum (*CA*), corpus cardiacum (*CC*), brain or supraœsophageal ganglion (*B*), and subœsophageal ganglion (*S*) were placed on homogenizer pestles and frozen until used. The tissues were homogenized in Hoyle's solution, one tissue per 0·02 ml. Recipient animals were deprived of food for at least 18 h prior to injection. Six to ten animals constituted the experimental groups and each animal received 0·01 ml. of one of the tissue extracts (equivalent to one-half tissue). Control animals received Hoyle's solution only. After 1 h the animals were quickly immobilized by carbon dioxide, thoroughly chilled in a freezer, and their hæmolymph extracted (as a group) by the centrifugal method[6]. A 0·1 ml. portion of hæmolymph was then analysed for glucose (glucose oxidase–peroxidase method[7]) and trehalose (anthrone method of Wyatt and Kalf[8]).

Some of the results obtained during this work are shown in Tables 1 and 2. For analysis, only experiments in which all four tissues were tested simultaneously are shown here. A total of 25 experiments were conducted, but in the

Table 1. Effects of Tissue Extracts on Hæmolymph Sugars; Male Donors and Male Recipients

(Values are in mg per cent)

	Extract	Glucose *CC*	Glucose *B*	Glucose *CA*	Glucose *S*	Glucose Control	Trehalose *CC*	Trehalose *B*	Trehalose *CA*	Trehalose *S*	Trehalose Control
Experiments	I	82	30	80	101	43	2,097	1,145	948	938	562
	II	564	236	47	281	36	3,008	797	703	347	529
	III	126	156	121	64	205	2,386	949	977	966	926
	IV	325	143	64	333	94	959	894	462	268	813