years time their homozygosity will be such that they can be released as commercial varieties of much improved qualities.

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Systemic Insecticides and the Mealybug Vectors of Swollen-Shoot Virus of Cacao

DURING the summer of 1949, samples of bis (bis-dimethylamino) phosphonous anhydride and bis (dimethylamino) fluorophosphine oxide prepared by Dr. B. A. Kilby, of the School of Medicine, Leeds, were received through Dr. R. A. E. Galley, of the Agricultural Research Council.

The chemicals were added to normal NPK culture solutions and their action tested against three common mealybug vectors of the virus disease known as 'swollen shoot of cacao'. The mealybugs used were *Pseudococcus citri* (Risso), *P. njalensis* Laing and *Ferrisia virgata* (Ckll.)[1]. With the first species naturally infested cacao seedlings were available; but artificial infestations by the other two species had to be made. These artificial infestations were successful, and healthy mealybug colonies became established on the test plants.

In the first series of tests, the chemicals were added to the nutrient solutions so that the final concentrations were 10, 50 and 100 parts per million. Five plants were used for each species at each concentration. Afterwards, 200 and 500 p.p.m. were also tried using natural infestations of *P. citri* as the test insects. Ten test plants were used at these higher concentrations. Similar numbers of untreated control plants were kept for each series.

The solutions were aerated at regular intervals and kept at the original volume by the addition of distilled water. During the eight-week course of the tests the plants generally flourished and, except for the phytotoxic effects mentioned later, their growth can be accepted as normal. It was thought that the presence of extra phosphorus might have a stimulating action, but a statistical analysis of the seedling heights in the first series before and after the test showed no significant gain or loss over the control plants.

Bis (bis-dimethylamino) phosphonous anhydride. Under the conditions of the experiment, this chemical was not successful in controlling the species tested at concentrations up to 100 p.p.m. At 200 p.p.m. apparently healthy colonies of *P. citri* were still active after eight weeks on nine of the ten test plants, although their numbers were markedly lower than those of the untreated control. At a concentration of 500 p.p.m. no mealybugs were found on four of the ten test plants, and the numbers on the others were very small indeed.

Bis (dimethylamino) fluorophosphine oxide. This chemical rapidly showed signs of being effective at 10, 50 and 100 p.p.m., and even at the lowest concentration a reduction in numbers of all three species became evident after two weeks. The time for complete control varied from two to six weeks except in the case of *P. citri* at 10 p.p.m., when the insects, which had reached very low numbers at the end of five weeks, showed a slight increase at the end of eight.

At the 200- and 500-p.p.m. levels, the oxide showed definite phytotoxic action. This entirely upset the experiment and the mortality figures for the mealybugs were rejected as being unreliable.

My thanks are due to Drs. Kilby and Galley for their assistance in making these preliminary experiments possible.

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Aug. 29.

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The Lotmar–Picken X-Ray Diagram of Dried Muscle

OWING to a number of unforeseen circumstances, mostly beyond our control, an incorrect version of part of our communication under the above title was printed in *Nature* of December 22, 1951. Our main conclusion, that a fibre repeat of 5·3–5·4 A. is in better agreement with the original Lotmar–Picken diagram than the value 5·65 A. given by Lotmar and Picken, was stated correctly and was deduced from the χ-values of the reflexions on the first layer line.

The majority of these reflexions listed by Lotmar and Picken and by Herzog and Jancke can be indexed satisfactorily in terms of a unit cell similar to that of Lotmar and Picken, but with $b = 5{\cdot}3$ A. This is indicated in the accompanying table, in which the calculated spacings are those for a monoclinic cell with $a = 11{\cdot}70$ A., $b = 5{\cdot}30$ A., $c = 9{\cdot}85$ A., $\beta = 73° 30'$. This table and unit cell should replace those given in the original letter.

OBSERVED AND CALCULATED *d*-VALUES

	Herzog and Jancke	Lotmar and Picken	Calculated
Meridian	5·33	—	5·30 (010)
1st layer line	4·90	4·80 (I_1)	4·80 (110)
	4·67		4·64 (011)
		4·27 (I_2)	4·09 ($11\bar{1}$)
		3·97 (I_3)	3·86 (210)
		3·62 (I_4)	3·60 (112)
	3·47		3·52 (012)
	3·10		3·12 (311)
		2·72 (I_5)	2·71 (013)
		2·51 (I_6)	2·51 (313)
		2·45 (I_7)	2·47 (412)

The only serious discrepancies are those between the observed and calculated values of I_2 and I_3; these may be within the limits of accuracy of the measurements. The calculated density, assuming four amino-acid residues in the unit cell, has the reasonable value 1·30 gm./c.c.

As mentioned in our previous communication, the α-helix of Pauling and Corey will require compression to reduce its pitch to about 5·3 A. if it is to be compatible with these results (assuming the latter apply to the fibrous proteins). This might introduce difficulties, for example, by producing improbably short hydrogen bonds and, further, the axial translation per amino-acid residue will be reduced to 1·47 A.

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