

possible chemical detection. This serious dairy problem thus provides another instance of the notorious tainting capacity of mercaptans.

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<sup>1</sup> McDowall, F. H., Morton, I. D., and McDowall, A. K. R., *N.Z. J. Sci. Tech.*, **28**, A, 305 (1947).

### Persistence of Benzene Hexachloride as an Insecticide on Lime-washed Surfaces

HITHERTO, benzene hexachloride has not been recommended for use on lime-washed surfaces, because it decomposes in lime slurry; it does not do so in slurries of chalk or ground limestone. Thus there was reason for believing that exposure to air would eventually make a freshly lime-washed surface suitable for spraying and, as the problem was of practical importance, the following experiment was made to settle the matter.

Porous earthenware surfaces were whitewashed with slurries freshly prepared from quicklime or whiting, aired for 1, 7 and 14 days, and then sprayed with enough benzene hexachloride dispersible powder to leave 7.4 mgm. gamma isomer/sq. ft. At intervals of two, three and four weeks *Sitophilus granarius* adults were exposed on the treated surfaces for two hours, after which they were placed with wheat for mortality counts four days later. The tests were made in triplicate.

Type of whitewash	Days aired before spraying BHC	Percentage mortality of <i>S. granarius</i> exposed after 0 to 4 weeks			
		0	2	3	4
Lime	1	98	73	8	4
Whiting	1	91	80	44	31
None	—	93	86	44	33
Lime	7	92	78	29	18
Whiting	7	77	65	40	23
None	—	99	63	23	4
Lime	14	99	41	27	11
Whiting	14	99	54	30	18
None	—	100	75	31	26

Results, given in the accompanying table, show that the deposit on the lime-washed surface lost toxicity relative to that of the other surfaces only after the second week when the airing period was one day. No relative loss occurred on any surface aired for longer periods.

A similar experiment using benzene hexachloride in kerosene yielded much the same results, though insect mortalities were lower, and differences between surfaces tended to be masked owing to absorption of the oil solution by the earthenware.

It is concluded that benzene hexachloride dispersible powder can be sprayed on surfaces seven days after lime-washing without loss of toxicity.

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<sup>1</sup> *J. Sci. Indust. Res.*, **4**, (2), 73 (1945).

<sup>2</sup> *J. Sci. Indust. Res.*, **4**, (8), 493 (1945).

<sup>3</sup> Buhur, N. E., *Arch. Biol. Tech., Curitiba*, **3**, 61 (1948).

<sup>4</sup> Slade, R., *Chem. Tr. J.*, **116**, (3017), 279 (1945).

### A Simple Needle for Micro-Injections

IN the course of experiments with injections of viruses into insect vectors, it became desirable to measure the amount of introduced inoculum. The conditions of the experiments demanded an instrument that would fulfil the following requirements: (a) to measure accurately the small amounts (approximately 1/8,000 c.c.) of liquid introduced into a single insect; and (b) to provide a means of introducing the inoculum into the small insects (leafhoppers) without excessive injury. The first condition could be fulfilled with many of the micro-injecting devices now on the market, or with the modified instrument described by Woodrow<sup>1</sup>. The use of any of these was complicated by the relatively large diameter of the injection needles. The problem was solved by drawing 'Pyrex' micropipettes similar to those ordinarily used for micromanipulation. These pipettes were sealed to hypodermic needles of 25 or 26 gauge. The glass and metal were cemented together with a paste made of glycerine and litharge. This simple device may also prove useful for introducing small amounts of fluids into cells.

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<sup>1</sup> Woodrow, A. W., *Science*, **110**, 142 (1949).

### William Higgins and John Dalton

PROF. J. R. PARTINGTON<sup>1</sup> has disputed the claim I made in my book, "The Story of Atomic Energy"<sup>2</sup>, that William Higgins and not John Dalton was the originator of the modern atomic theory, to which Prof. F. A. Paneth<sup>3</sup>, in reviewing the book, had directed attention. However, Prof. Partington omitted to mention what I had stated to be Higgins's main claim to fame and ten times more interesting than anything Dalton did. Hence, I trust readers of *Nature* will consider this fresh evidence before making up their minds on the issue.

Briefly, this was that Higgins, by experiments and reasoning which were strangely modern, correctly deduced without any further assumption whatever that if the chemical formulæ of water and sulphur dioxide, respectively, were taken as HO and SO, that of sulphuretted hydrogen was HS<sub>2</sub>. Since the two assumed formulæ make, with O = 16, the atomic weights of hydrogen 2 and of sulphur 16, to modernize them the number of hydrogen atoms must be doubled and of sulphur halved, giving correctly, H<sub>2</sub>O, SO<sub>2</sub> and H<sub>2</sub>S.

Perhaps Prof. Partington will explain how he could have done this without taking into account the weight of the atoms or (except for SO) on the view he imputes to him that the weights of different atoms were the same. I suggest that historians of chemistry who have read Higgins's 1789 book should read it again, and that Daltonians in general who have not read that book (or mine) should try to do in 1951 what Higgins had done in 1789, Avogadro barred.

Before Richter's "Elements of Stöchiometry" (1792-94) had given us the idea of chemical equivalents, before the Proust-Berthollet controversy which began in 1799 had established the constancy of the