AGRICULTURAL RESEARCH COUNCIL

Cabinet Users' Meeting, Rothamsted, November 16 1968

Dr. Brown (Birmingham), Dr. Casely (W.R.O), Mr. Lee (Imp. Coll., Chelsea) Dr. Hussey & Dr. Sunderland (John Innes), Dr. Hurd, Mr. Randall & Mr. Atkin, (G.C.R.I., Mr. Harris & Mr.Barman (N.I.A.E.), Dr. Hardwick (N.V.R.S.), Dr. Govier (Belfast), Dr. Jewiss and Mr. Farrow (G.R.I.), Mr Bambridge (Nottingham), Dr. Watson, Dr. Thorne, Dr. Dart and other local staff (Rothamsted) Mr. Morgan (Cambridge), Dr. Hughes & Mr. Dickinson (Reading).

1) Daylit Cabinets. There had been a meeting of all interested parties at which it was agreed that the G.C.R.I. requirements on the one hand and the G.R.I.-N.V.R.S.- Rothamsted on the other merited separate approaches. The G.C.R.I. project has funds authorised and is proceeding. The other group met again to draw up more detailed places for a unit about the size of a Saxcil cabinet intended for use free standing out of doors. N.V.R.S. and Rothamsted hope to have funds available for development and construction within the next few years, but G.R.I. have no funds earmarked this within the next five years. Mr. Austin is preparing a report for submission to the A.R.C. in the near future in the hope that N.V.R.S. and Rothamsted can combine to share the development costs.

2) Prestcold Cabinets. Dr Hussey reported that the 6 Prestcold Cabinets at John Innes Norwich. The salient features of general design and performance were:

(a) The Honeywell control system was very bulky and spares expensive

(b) The lamp housing containing 30 x 80 watt tubes (2,000 f.c. was maintained always at 30°C by either direct expansion refrigeration (1 H.P>/cabinet) or with night time heaters.

(c) The indirect cooling for the plant space was a ring main which had frequent air leaks. A high level bleed was needed to prevent this.

(d) The heater was modulated by a remote saturable reacter of 3.6 kw.

(e) A spinning disk humidifier with a vast throat was needed but 5% of the water spun off was collected as condensate from the cooler bank.

(f) The sensors were dry bulb and Electronic Lithium chloride hygrometers.

(g) The mode of operation was that the humidifier ran continuously, the cooler bank was called in by the hygrometer and the heater gave the working temperature. The humidifier and cooler in effect worked against each other with the heater aiming to over-ride for working control. This worked but was very expensive to run and if it did go wrong led to rapid and serious loss of control. The continually heated or refrigerated light housing added to the running costs.

(h) The cabinets were relatively, but not entirely, airtight.

There seems no very good reason why the humidifier, cooler and heater system could not be redesigned to give economic and stable operation.

3) Other cabinets. Belfast (Dr. Govier) had two Shirer Gillette cabinets which were very useful and performed well at high light intensities (up to 4,000 f.c. over range 7-35°C (down to 2°C with no lights) at 40-90% R.H. Replacement parts were specially obtained from America.
R. W. Gunson Ltd. Kelvedon, Essex, had a room provided by Controlled Environments Ltd of Canada. Dr. Thorne had had experience of these in Canada and spoke highly of them.

4) Visit to Carl Weiss factory. A group, including some Saxcil cabinet users, had visited the Giessen factory of the firm, whose English agents are Stanhope - Zeta of Eaglefield Green, Egham, Surrey. The cabinets were very sophisticated and extremely expensive. The chief features of interest were humidifying methods, a Lithium chloride hygrometer of the "heat to infinite resistance" type and Xenon arc lamps. Mr Morris is collecting a report for submission to the A.R.C. and is investigating the importing of the Lithium chloride elements which have a thermocouple, thermistor or resistance thermometer as their ultimate detector.

5) Leakage rates. It was generally agreed that the best measure of the leakage rate would be the half-time i.e. the time taken after termination of the supply of say, CO_2 for the concentration to fall to half way between the enriched level and ambient.

6) Service Agreement. None of those present proposed entering into a service agreement with Saxtons. It was agreed that people with Mark I cabinets would send a list of their spares to Reading to be collated and circulated. Most of the Mark II cabinets were still under guarantee and no action seemed necessary for maintaining these as Saxtons held good stocks of most spares.

7) Gas monitoring

a) Carbon dioxide. The Conductivity Analyser patented by Dr Brennig James had still not been perfected as a production instrument. The instrument was a continuously sampling, non-equilibrating devices and would cost about £150 with a Weston high and low control microammeter. The agents are Jacobsen van dem Berg and Co. Ltd., Emerald Street, London, W.C.1. G.C.R.I. were making a number of modified instruments under a royalty agreement and these appeared to give adequate control in preliminary tests.

Mr Bowman reported that his patented 1½-2 min. intermittent equilibrating device might be commercially produced by Profit Systems Ltd. of Poole for about £200.

A German conductivity meter using the soda to carbonate system was commercially available and the English agents were Elliott Automation Ltd., Blackwall Lane, Greenwich, London, S.E.10.

b) Ethylene. Dr. Dart (Rothamsted) had had some experience of ethylene detection using a gas chromatograph.

c) Sulphur dioxide. Dr Hardwick (N.V.R.S.) had an analyser borrowed from Warren Springs, based on the formation of H_2SO_4 from H_2O_2 and SO_2 in the presence of H_2SO_4.

d) Gas calibrations. The guaranteed mixtures produced by Hilger and Watts were not very good. Dr Hurd reported that B.O.C. would analyse accurately any cylinder of gas and provide cylinders of specified mixtures with a certified composition on a rental basis. Contact Mr. R. Lang, B.O.C. Special Gases Dept., Deer Park Road, London, S.W.19, for further details.

8) Toxicity problems. Most users had. noticed inexplicable disorders of plants at some time. As reported at the previous meeting, many plastics are phytotoxic.

Certain cauliflower varieties (especially Asmer's 'Highlight') were extremely sensitive to the Wellesbourne malaise. Activated charcoal had been effective in removing most of the trouble, which was thought to be due to SO_2. Potentate tomatoes suffered at John Innes (? due to salt spray from the disk humidifier). 'Green Globe turnips in one corner of one cabinet at W.R.O. and

chrysanthemums occasionally in one cabinet only at Reading also showed marginal brown leaf markings.

The W.R.O. were investigating volatiles in the cabinets with electron capturing gas chromatography.

9) Xenon Arcs. No-one had any real information about Xenon arcs. It was thought that Botany (Aberystwyth), Botany (Leeds) and Feed Res. Organisation (Norwich) had them. Mr. Canham was to be asked to review the situation.

10) Fluorescent lamps. R.V.R.S. had scanned the spectrum of Philips 29 (Standard Warm White) 34, 37, and Atlas De Luxe Warm White and found increasing far-red/red ratios and improved bulbing of onions in the same order. Philips 55 and 57 also have relatively good far-red omission (comment from Mr. Canham).

Dr. Govier had favourable results with a mixture of Growlux and Northlight. Dr. Thorne commented that Wide Spectrum Growlux lamps had been found useful in America and Canada, but they are not readily available here.

The general feeling was that the different tubes had small, useful advantages in particular cases hut that Warm White was a good general purpose tube, readily available and consistent from batch to batch. The possibility of a bulk purchase of say 100-200 Wide Spectrum Growlux tubes was to be followed up by Dr. Hughes at A.R.C. H.Q. In the meantime no hulk purchasing of fluorescent lamps was envisaged as most users already obtained lamps locally at competitive prices.

11) Alarm Systems. Most people had a scientist looking in on Saturdays and Sundays and trusted to luck that a public spirited passer-by would phone some-one up if the bell was ringing out of working hours. A few places had resident staff with bedside bells.

An automatic phone which called a Security Service cost about £200 to install and there was then a modest annual covering fee plus a service per call charge (N.V.R.S, and G.C.R.I.).

Alarms which automatically phone one (or worse several) specified individuals are to be avoided. The one person is out or everyone is called out.

12) Dealing with pests - see attached sheet.

13) Separate meetings for engineers. The present Cabinet Users' Meetings, consisting of a session on a mixture of biological and engineering subjects followed by a visit to the host Institute's facilities was agreed to be satisfactory.

14) Miscellaneous. Rockall grease for the gear box of the Grubb Parsons I.R.G.A. is available from Dr. Hardwick (N.V.R.S.).

15) Next meeting. Autumn 1969 at G.C.R.I. Littlehampton by kind permission of the Director.

A.P. Hughes