in Table 1, the morning ascorbic acid values calculated back to the weight of the plants in the evening. The

TABLE 1

ASCORBIC ACID VALUES—MG PER CENT

	Expt. 1	Expt. 2	Expt. 3
Evening (4–5 P.M.)	62.8	52.0	46.3
Next morning—cut plants (8–9 A.M.)	47.7 (15)	32.9 (18)	22.5 (12)
Next morning—uncut plants (8–9 A.M.)	31.5 (0)	27.8 (3.5)	18.2 (2)

figures in parentheses represent the per cent. increase in weight of the plants overnight.

From these data it appears that the cut plants retained, respectively, 51, 18 and 24 per cent. more ascorbic acid than the growing plants in the three experiments; even though the cut plants gained 10 to 15 per cent. more in weight, their percentage of ascorbic acid was, respectively, 34, 7 and 10 per cent. higher than uncut plants in the three experiments.

The data indicate that the losses in ascorbic acid noted in vegetables and fruits in storage are not due entirely to oxidation by atmospheric oxygen, as is often stated, but due to its being used in some physiological process, the activity of which is diminished by severing the plant from the root system.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN EGG INOCULATOR AND SHELL MEMBRANE TEASER FOR VIRUS CULTURE

IN view of the extensive use now made of the chorio-allantoic membrane of chick embryos for the cultivation of viruses, it seemed desirable to simplify the technique of inoculation and at the same time, if possible, decrease the losses due to accidental injury of the membrane. The egg inoculator, shown in Fig. 1, satisfies these requirements.

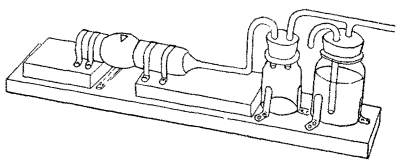

FIG. 1. Egg inoculator.

A triangular window is cut in the shell in the usual manner and a hole drilled into the air sac. The egg is then placed between the two rubber rings of the inoculator. The one which grasps the pointed end of the egg is mounted on a movable base actuated by springs which force the rings together. The other ring forms a tight junction with the egg and is connected with a suction device. A simple by-pass prevents the suction from becoming great enough to cause damage. When the suction exceeds the hydrostatic pressure of 5 centimeters of water, air passes down the tube and bubbles up into the system, maintaining the negative pressure at a constant level. The air sac and through it the interior of the egg is, in this way, subjected to a continuous negative pressure while the fragment of shell is being removed and the slit made in the shell membrane.

Instead of a needle for making the slit in the membrane, a shell membrane teaser is used. This is easily formed from a single limb of a pair of curved forceps. The tip is bent backwards in such a way that when the instrument is applied vertically to the shell membrane, and then drawn sideways, the serrations catch the fibers of the membrane. The lateral traction causes a tear in the membrane at a slight distance from the teaser. The location of the slit, together with the fact that the constant suction causes the chorio-allantois to drop the instant the slightest tear forms in the shell membrane, combine to prevent injury by the instrument to the chorio-allantois. The egg is now ready for inoculation in the usual manner.

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A QUANTITATIVE VAPORIZER

AIR disinfection depends upon quantitative dosage control. Vaporization of chemical disinfectant may be quantitatively controlled by regulation of heat applied. In non-conducting fluids resistance coils can be submerged directly into the liquid and, since heat loss from the walls of a vessel at constant temperature (near boiling point of the fluid) is uniform, the excess heat absorbed in vaporization can be regulated by the amount of current supplied to the coil.

The sketch shows a simple U tube with a short length of heating element immersed in propylene glycol used in experimental study of chemical disinfection of air. To prevent uncovered resistance wire from reaching ignition point, copper leads transmit the current through the liquid to the coil. The air stream passing over the surface of the liquid carries the vapor into the dosing chambers.

An ordinary heating element submerged in a beaker of propylene glycol will evaporate upwards of a gram per minute. Care should be taken not to allow resis-

tance wire carrying current to emerge from liquid surface, and to insure against this possibility it may be desirable to provide a constant level device. Other

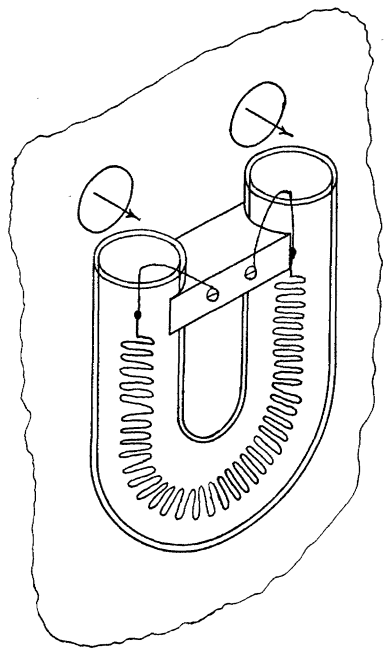

FIG. 1.

adaptations may provide convenient means of vaporizing propylene glycol or other non-conducting fluids in experimental air disinfection.

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HEAT INACTIVATION OF WHEAT MOSAIC VIRUS IN SOILS

WHEAT mosaic virus *Marmor tritici* H.[1] is of interest not only because of the economic losses induced in winter wheat in certain wheat-growing areas of the Midwest, but also because it may be directly transmitted from the soil. Previous studies[2, 3, 4] on the relationship between soil and virus suggested an investigation to determine the resistance of the virus in the soil to heat. Virus-infested soil at optimum moisture content was passed through a screen of ¼-inch mesh, placed in stoppered test-tubes 3 cm by 20½ cm in size and tamped lightly. Twenty-five soil samples contained in these tubes were heated at each of the temperatures: 40°, 50°, 60°, 70° and 80° C. A thermometer was inserted into the center of one tube in each series of tests and the samples immersed in an electrically heated and thermostatically controlled water bath. The tubes were spaced and the water forced to circulate freely between them by means of an electric stirrer. After the soil had reached the desired temperature in the tube containing the thermometer, a 10-minute exposure was given, after which the tubes were removed and immediately cooled in running tap water. The soil was then emptied into No. 10 tin cans. Wheat seeds of variety Purdue No. 1 were planted in the treated soil and the young plants kept outdoors over winter. After dormancy was broken it was found that all wheat plants grown in soil heated at 40° and 50° C were affected with mosaic, while all plants in the remaining series were healthy. These results indicate that wheat mosaic virus is inactivated in the soil between 50° and 60° C at an exposure of 10 minutes.

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[1] These laboratories are supported by a grant from the Commonwealth Fund to the University of Pennsylvania for studies in the prevention and control of air-borne infection.

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[3] R. W. Webb, *Jour. Agr. Res.*, 35: 587–614, 1927.

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