develop in size, at the expense of the less dense material (Fig. 8), to emerge as a mature particle. The picture of mature virus forming from larger, less dense bodies imbedded in a matrix material is similar to the situation described by Banfield, Bunting, Strauss, and Melnick (*4*) for molluscum contagiosum. In retrospect, some of their micrographs may be reinterpreted in the light of the present findings. Close re-examination of their original plates (*4*) reveals that in molluscum contagiosum the "holes" in the cytoplasmic matrix contain dense bodies ranging from the barely visible to the size of mature virus particles, with the entire "virus developmental" body seemingly encased in a fine membrane. We have also observed similar developmental forms (precursors of mature virus) in cells infected with ectromelia virus, another member of the pox group.

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Manuscript received June 18, 1952.

Crown Gall Suppression by Anti-Auxin[1]

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The continued depression of auxin level in plants, following exposure to ionizing radiation (*1*), has been suggested (*2*) as a mechanism by which radiation suppresses crown gall caused by *Agrobacterium tumefaciens*. If this suggestion is correct, then other agents that lead to auxin destruction should suppress galls.

This prediction was tested by exposing carrot roots inoculated with *A. tumefaciens* (*3*) to maleic hydrazide (MH), an agent that increases enzymatic destruction of indolacetic acid (IAA) (*4*). A carrot root was surface-sterilized, cut transversely into 12 slices ½ cm thick, and a slice placed apical-end down on 2% water agar in each of 12 Petri plates. Similar slices from 3 other roots were also placed in each plate. The surfaces of all slices were inoculated at the same time with an aqueous suspension of *A. tumefaciens* (Riker's strain A-6). The 4 slices in a plate were transferred at the times shown in Table 1 to another plate, where the agar solution contained a 2.67×10^{-3} *M* concentration of the diethanolamine salt of MH.[2] After incubation at room temperature for 12 days, the galls on the slices from each root were ranked according to size (Table 1).

Evidently crown gall development is suppressed by MH applied as late as 168 hr after inoculation. Similar results were obtained in experiments using plants growing in the greenhouse. When the roots of tomato plants were dipped in 5.24×10^{-3} *M* solution of MH salt 8 days after, or at the time of, inoculation, only small galls developed, whereas large galls developed on untreated plants.

TABLE 1

RANK OF GALL SIZES ON CARROT ROOT SLICES TRANSFERRED TO A 2.67×10^{-3} *M* SOLUTION OF DIETHANOLAMINE SALT OF MH

Transfer, hr before (−) or after (+) inoculation	Root			
	1	2	3	4
−168, −120, −24				
0, +4, +8	0*	0	0	0
+ 24	0	0	4	0
+ 96	1†	2	1	0
+168	2	1	2	0
No. MH	3, 4‡	3, 4, 5	3, 5, 6	1, 2, 3

* No gall.
† Smallest gall on root 1.
‡ Contaminated.

The effect of MH upon multiplication of the pathogen was determined by growing it in a 2% glucose and 0.2% yeast extract medium containing concentrations of the MH salt up to 28.8×10^{-3} *M*. No relation between turbidity and MH concentration was evident after 24 hr at room temperature.

These experiments show that MH, which is known to increase enzymatic destruction of IAA (*4*), suppresses gall formation by affecting tumor enlargement, not by affecting alteration of normal to tumor cells or by affecting pathogen multiplication. In these respects MH suppresses galls in the same way as does ionizing radiation. The hypothesis that radiation suppresses galls by depressing the auxin level has thus led to a prediction borne out by experimentation. Whether the hypothesis accounts for the entire radiation effect remains to be seen.

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[1] Research conducted under contract AT(30-1)-580 with the Atomic Energy Commission.

[2] The MH was supplied by the Naugatuck Chemical Division, U. S. Rubber Company.

The Effect of Triphenyltetrazolium Chloride on Oat Embryo Respiration[1]

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The reduction of tetrazolium salts has been widely

[1] Journal Paper No. J-2115 of the Iowa Agricultural Experiment Station, Ames. Project 1083. This study was made in part under authority of the Agricultural Marketing Act of 1946 (RMA, Title II) and was carried out in cooperation with the Grain Branch, Production and Marketing Administration, U. S. Department of Agriculture.