

The Bulletin
of the Torrey Botanical Club

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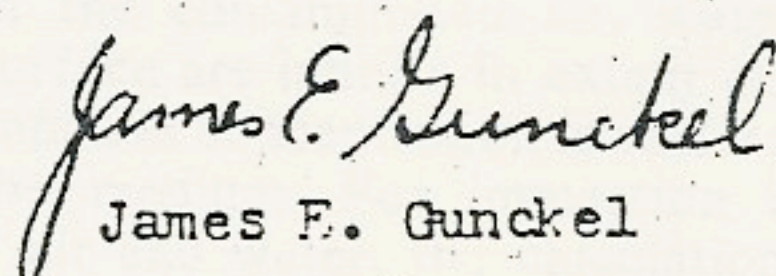
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I have carefully examined a few specimens of common plants collected shortly after the accident at TMI and compared them with specimens collected more recently. The current abnormalities are probably carried forward by induced chromosomal aberrations. There were a number of anomalies entirely comparable to those induced by ionizing radiation -- stem fasciations, growth stimulation, induction of extra vegetative buds and stem tumors.

Most of the stem abnormalities described in the literature, and in my own experience, are induced by relatively high doses of X or gamma rays extending over a period of usually 2-3 months. Notable exceptions, however, are similar responses to beta ray exposure from radioisotopes (P^{32} , Zn^{65} , Ca^{45}) and for only 24 hours. In other words, it would have been possible for the types of plant abnormalities observed to have been induced by radioactive fallout on March 29, 1979.

In discussing the general biological effects of irradiation, some clarification may be helpful. In plants, the dose rate (e.g., mr/hr) is much more important than total dose (e.g., mr/yr) in inducing abnormalities. Further, the "quality factor" for gamma and beta radiation is not the same as generally assumed. In fact, I have incontrovertible experimental results to show that beta rays are at least a quality factor of two in plants.

I am the world authority on modifications of plant growth and development induced by ionizing radiations, having researched this area for 34 years at the Brookhaven National Laboratory and at Rutgers University. The three review papers appended attest to my expertise.


James E. Gunckel