period to the next. Thus, 0.025% colchicine did not produce 100% arrested metaphases during the first 24-hour treatment, but during the second 24-hour treatment, all were arrested. The practice was eventually adopted of using a higher concentration for the first cycle of treatment than during succeeding ones.

In the first experiment, 500 maize seedlings were given three 24-hour treatments in 0.05% colchicine, interrupted by 24-hour recovery periods in distilled water. Of the 16 survivors of this treatment, 4 were confirmed tetraploids (their pollen produced full seed sets when tested upon an established tetraploid), and 2 were probably tetraploid (produced pollen, some of which "stayed" on a 125 micron screen). In the second experiment, 500 maize seedlings were treated for the first 24 hours in 0.05% colchicine, allowed to recover for 24 hours, and then treated for an additional 24 hours with 0.025% colchicine. Of 152 survivors of this treatment, 5 were confirmed tetraploids and 10 were probables. There appeared to be only one case of 2N-4N sectoring. The rest appeared to be cases where the entire shoot apex had become tetraploidized.

Dr. J. Van't Hof's "colchicine bible": Use colchicine from a source where the quality of the chemical is consistent, e.g., L. Light & Co., Ltd., Colnbrook, England, and store in the dark in a desiccator over $CaCl_2$. Always make up fresh solutions immediately before use. Always establish optimal levels for each new variety by experimental dissections and fixations.

D. L. Shaver

4. A mechanical method of classifying large numbers of seeds for waxy.

The work of O. E. Nelson of establishing the map characteristics of the wx cistron of maize has established an exceedingly useful system for the study of the nature of mutation in a higher organism. However, in the initial steps of producing and screening for mutations produced by radiations or chemical mutagens, one is faced with a Herculean task of physically classifying maize kernels for wx in sufficient number that one can realistically expect to recover a meaningful number of induced mutants.

In order to speed this task, a Red Devil paint shaker model 30 was obtained. The sides of two one-gallon paint cans were lined with floor sanding paper with a no. 2 grit (Behr-Manning Co., Troy, N.Y.). The machine was connected to a standard greenhouse timing switch so that runs could be made while the machine was unattended. It was found that this machine could easily scarify 2,000 grams or ca. 11,000 kernels at one time. Doubtless it could be adapted to larger containers and this could be greatly increased. It was necessary to perforate the ends and sides of the cans with numerous small holes to allow the dust to sift out, and thus avoid "filling" of the sandpaper. Frictional heating of the can and its contents could be avoided by setting the timing switch to 15 minutes on, 15 minutes off, etc. Two and one half to three hours running time was sufficient to scarify the seeds for wx classification.

As a result of this scarification treatment, the pericarp and aleurone layers were uniformly worn away, especially on the edges and tips of the kernels, while a recessed "germ" or embryo usually escaped damage. Such seeds could then be dipped in weak IKI solution, and rapidly spread upon an absorbent material to dry while being classified for wx. Searching for mutant kernels was as simple as looking for a red-brown ball among many black ones. Small batches were stained at a time, after rinsing away the loose dust, and immediately searched for mutants since the contrast between wx and Wx kernels is best just after staining.

It should be emphasized that the usefulness of the method depends upon having kernels in which the germ is recessed. This was the case in well-pollinated ears of M14, but is not true of many other inbred lines. From a practical point of view, even with M14 the method will be found unsatisfactory unless full sets of seed are obtained so that resulting kernels will be flat instead of round. Perhaps isolation-detasseling production of subject kernels is the most practical way of obtaining the needed numbers and quality of seed.

D. L. Shaver

5. id maize.

Several attempts have been made to mate id/id plants carrying a newly found id gene (Shaver, MNL 31:94) with id/id plants having the classical C30 id allele (Galinat and Naylor, AJB 38:38–47). Various manipulations of photoperiod have succeeded in inducing flowering, but the small ears produced have always been barren. Since it seemed impossible to mate homozygous id plants, an alternative procedure was employed, that of mating normal plants in segregating families from the two id sources. Of 16 ear progenies so obtained and grown in Florida this winter, 7 segregated for the id phenotype, indicating that the id genes from the two sources are allelic. It is interesting that the id/id plants, planted November 10, 1963, were not induced to flower as of January 28, 1964, in spite of the fact that they were grown in a regime which induces teosinte (the interval between sunrise and sunset on December 21 being only $10\frac{1}{2}$ hours). This experience agrees with observations in Florida a year ago. Homozygous id/id plants, seeded October 15, 1962, were not induced as of March 10, 1963, at Princeton, Florida.

D. L. Shaver

6. Relative biological efficiency of monoenergetic fast neutrons on chromosomes in maize.

Investigations on the relative biological effectiveness (RBE) of densely ionizing radiations (with high LET, rate of linear energy transfer) are of importance in both fundamental and applied radiobiology. The difficulty in determining RBE on the basis of chromosomal exchanges or 2-break aberrations is that the dose-response curves differ for radiations of different LET and dose rate. Maize seeds of Yg_2/yg_2 genotype were used to study the RBE of fast neutrons vs. X rays.