and near diploids that could be desired. If the remaining task is essentially one of obtaining fortuitous crossovers in order to place perennialism-conferring loci into maize chromosomes, one then appears to be in the position of having the means by which any degree of pressure may be applied to the problem that it may require.

D. L. Shaver

2. A simple mechanical method of inducing tetraploidy.

Heat shock and colchicine treatments, historically speaking, have yielded a very low percentage of success in producing maize tetraploids. Recently, genetic methods of introducing new chromosomes from diploids into existing tetraploids have been proposed and come into vogue. These methods, involving the genes elongate, asynaptic, and ameiotic, however, require several generations to bring the inducing gene into the background one wishes to tetraploidize before one succeeds in deriving the desired diploid gametes. In an agronomic situation, one eventually faces the problem of linkage of the inducing genes to unfavorable factors. Moreover, the inducing gene itself is introduced into the new tetraploid, where it is then undesirable.

Two experiments have shown that one can easily introduce desired chromosomes from diploids into existing tetraploids by the straightforward procedure of crossing a 4N female by the desired diploid. If the resulting shriveled seeds are dissected and the embryo proper is removed and shallowly planted in moist soil, or other situation where the developing embryo can soon persist on its own photosynthate, no difficulty is encountered in growing these triploid embryos. (The dissection procedure was suggested by Ellen Dempsey.)

Triploids produce much pollen in the greenhouse, or out-of-doors on Long Island, but they may not if grown outside in less favorable environments. One can collect this pollen in conventional pollen bags, or by shaking it directly off of the tassels, and then straining it through a stack of U.S. Standard Sieves (W. S. Tyler Co., Cleveland 14, Ohio). A top screen with a mesh size of 149 microns removes clumped pollen and loose anthers. The next screen with a mesh size of 125 microns catches a small proportion of the very largest pollen grains from triploids (and tetraploids). No diploid has yet been found to produce pollen grains which "stay" in this screen. The next screen with 105 micron mesh catches most of the large grains. These were discarded in this experiment. The next screen with 74 micron mesh catches most of the viable small grains, while the last, 53 micron mesh, seems to catch only aborted or dried grains.

The following results were obtained by sibbing a population of triploids with the 74 and 125 micron pollen fractions:

74 Micron Pollen		125 Micron Pollen	
Chrom. No.	No. of Individuals	Chrom. No.	No. of Individuals
20	1	23	1
21	1	30	2
22	1	33	3
23	4	34	2
24	2	36	5
25	5	37	4
26	2	38	4
27	1	39	1
28	1		
29	4		
30	1		
32	1		

It is evident that the screening procedure results in two nearly discrete populations. If one sibs among the 36-39 chromosome individuals, one obtains a new population having many individuals with 40 or more chromosomes. The chromatin of such newly constituted tetraploids should derive approximately 45% from the original diploid parent.

D. L. Shaver

3. A successful colchicine method for Zea.

In producing tetraploids of Zea, the "target" for colchicine action is the undifferentiated meristem of the shoot apex. Probably because of complications involved in the various techniques of getting colchicine through the several multicell-layered embryonic leaves which ensheath the apex, production of tetraploids by means of this mitosis inhibitor has with few exceptions been disappointingly difficult.

Faced with the necessity of deriving tetraploids from a 2N population directly, a method of applying colchicine proposed by Dr. L. F. Randolph in one of the early Maize Genetics Cooperation News Letters was used in conjunction with colchicine techniques suggested by Dr. J. Van't Hof at Brookhaven. Seeds of maize were germinated until the primary root reached about $1\frac{1}{2}$" in length. About $\frac{1}{4}$ to $\frac{1}{2}$ inch of the root tip was cut off under distilled water to expose the large, empty xylem vessels of the differentiated portion of the root. The seedling was then suspended on hardware cloth above an aqueous colchicine solution in such a way that only the decapitated root tip was immersed, and the young seedling therefore was forced to supply its entire transpiration stream through the decapitated root.

Effective colchicine concentrations were determined by dissecting out the shoot apex, smearing, and determining the proportion of colchicine metaphases present. In this manner, proper concentrations were determined for the specific material used. Possibly another strain or variety could have a different optimal level. In this work, one chose the lowest level at which all observed metaphases were "arrested." It was found that there is an accumulation of colchicine effects from one treatment