The present data suggest that I_2 may be either on chromosome 9 or chromosome 7. However, the recombination value of 18.36% between I_2 and wx is about the same as that between I_1 (C^I) and wx and it would not be surprising if I_1 and I_2 turn out to be allelic.

Comparisons between I_1 and I_2 have been made regarding their expression against a common colored aleurone tester. Various R stocks in a common background have also been tested against I_2. These were included at the suggestion of Prof. R. A. Brink and the seed was kindly made available by him. The data are summarized in Table 1.

The following observations are made:

(1) I_2 seems to have somewhat less capacity to inhibit aleurone pigmentation than either I_1 (Coe) or I_1 (Coop). The differences could be due to differences in the genetic background. If the differences are real, two classes of colored kernels would be expected on test crossing the I_1 I_2 heterozygote on A C R. This test is under preparation.

(2) All the colored aleurone stocks carrying different R alleles are inhibited much more than the standard A C R. The significance of this observation is not clear. One would have anticipated that at least there should have been less inhibition by I_2 against A C R^{sc} than with A C R.

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2. UV--Irradiation of $\widehat{A_1 Ds}$ pollen.

Pollen grains with the genotype $\widehat{A_1 Ds}$ (without Ac) were irradiated with ultraviolet light obtained from a germicidal lamp. The idea was to see if Ds can be "mutated", inactivated or deleted without affecting the A_1 locus. The change so brought about should be detectable as full or partially colored kernels in the cross to an appropriate tester (a_1^s sh_2 or $\widehat{A_1 Ds}$--both with ac). We have now tested 2279 UV--irradiated gametes. Not a single colored kernel has been obtained.

(Seeds for this study were kindly made available by Dr. Barbara McClintock.)

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3. Role of chemical composition in radiosensitivity of seeds.

(a) Protein content: Maize strains differing in their protein content were tested for their radiosensitivity. The low protein (L.P.) strain having only about 5% protein in seeds, was compared with the high protein (H.P.) strain which had about 23% protein. The two strains differ in their rates of growth, L.P. being the slower of the two. Because one of the criteria of radiobiological damage is seedling height in a finite period direct comparison would not be possible. Since differences in protein content between L.P. and H.P. appear to be primarily due to

differences in zein content (which is localized in the endosperm), it seemed feasible to produce hybrids, by reciprocally crossing H.P. with L.P., differing in their endosperm protein contents but having identical germs. When such crosses were made, kernels from (L.P. X H.P.) and (H.P. X L.P.) phenotypically resembled those of L.P. and H.P. respectively. Analysis of the amino acid content, more or less confirmed the above observation--(L.P. X H.P.) amino acid content was slightly higher than L.P., and (H.P. X L.P.) amino acid content was somewhat lower than H.P. (Table 2).

Table 2
Amino Acid Content of L.P., H.P., (L.P. X H.P.) and (H.P. X L.P.) Lines (mgm/gm of Seed)

Amino Acid	L.P.	L.P. X H.P.	H.P. X L.P.	H.P.
Aspartic acid	2.904	3.20	8.80	14.46
Glutamic acid	8.08	9.04	27.56	33.16
Threonine glycine	4.00	3.72	11.60	15.76
Histidine	4.0	2.60	7.56	12.00
Alanine	1.00	1.32	2.84	4.92
Tyrosine	8.56	9.12	26.64	39.96
Lysine	2.32	3.04	10.40	16.00
Valine	1.60	2.40	2.40	2.20
Methionine	2.36	2.08	2.68	1.84
Phenylalanine	3.28	2.44	4.40	3.28
Arginine	1.88	1.72	2.60	2.04
Proline	4.28	4.60	4.16	4.60

Seedling height data were recorded 11 days after sowing and survival data after 24 days. Growth rates of the two hybrids were the same. Data are summarized in Table 3.

Table 3
Height and Survival of L.P., H.P., (L.P. X H.P.), and (H.P. X L.P.) Plants Following Irradiation with Co^{60} Gamma Rays

Treatment of Seeds*	H.P.		L.P.		(H.P. X L.P.)		(L.P. X H.P.)	
	Ht. (Cm.) Mean	Survival (%)	Ht. (Cm.) Mean	Survival (%)	Ht. (Cm.) Mean	Survival (%)	Ht. (Cm.) Mean	Survival (%)
Control	11.34	87.80	7.41	92.98	12.36	94.29	12.45	100.00
5,000 r	9.45	75.68	6.40	83.33	12.00	89.65	10.80	83.33
10,000 r	5.08	64.82	4.12	67.44	9.08	91.22	9.63	82.14
15,000 r	3.16	44.07	2.94	45.65	-	-	-	-
20,000 r	-	-	-	-	5.65	87.50	5.70	92.00
25,000 r	2.31	3.64	2.25	25.00	-	-	-	-

*Seeds were stabilized for their H_2O content over $CaCl_2$.

It is apparent from these data that the protein content of the endosperm has very little influence on the radiosensitivity of the germ. It is also noteworthy that both the hybrids exhibit conspicuous radioresistance when compared to either L.P. or H.P.

(b) Oil content: Low oil (L.O.) and high oil (H.O.) strains were likewise compared. L.O. has about 0.75% oil and H.O. about 15%. Oil is for the most part localized in the germ. Surprisingly the H.O. strain appeared to be more radiosensitive than the L.O. This result might be due to the fact that the germ size of the L.O. strain is very much smaller than that of the H.O. strain (see Table 4).

Table 4
Germ and Endosperm Weights of Low and High Oil Strains of Maize

Maize strain	Average wt. of whole kernel (mgms.)*	Ratio of whole kernel wt. L.O./ whole kernel wt. H.O.	Average germ wt. (mgms.)*	Average endo-sperm wt. (mgms.)*	Ratio of germ wt./ endo. wt.
High Oil	170.30	1.76	25.10	145.20	0.173
Low Oil	300.00		13.20	287.00	0.046

*Measurements made on 50 kernels. Consequently, the actual total deposited dose may be less in L.O. than H.O.

(Foundation stocks of Ill. L.P. and Ill. H.P. and considerable background information were kindly supplied by Drs. D. E. Alexander, R. W. Jugenheimer, E. R. Leng, and Mr. R. J. Lambert, University of Illinois, U.S.A.)

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4. P^{32} treatment of cytoplasmic male sterile seeds of maize.

Cytoplasmic male sterile seeds of an inbred line WF9-21MS were treated with P^{32} in an attempt to inactivate the (presumable) plasmids and/or episomes conditioning the male sterility. The source of male sterility is the Texas or "T" type cytoplasm. Earlier attempts made by Brawn (MNL 37, 86, 1963) to "cure" maize of its plasmids with heat and certain chemicals known to affect plasmids, were unsuccessful.

We have argued that if nucleic acids are the main carriers of genetic information, then it might be easier to inactivate these particles by incorporating P^{32} in their nucleic acid. Decay of the P^{32} atom is accompanied by 3 events: (1) emission of a particle, (2) an equal and opposite recoil for the nucleus, (3) transmutation. In bacteria and viruses the transmutation and recoil components are more efficient in inactivating.

Technique: Seeds were soaked in a carrier free P^{32} solution (10 μc per seed) for 48 hours in petri dishes and are now being grown in the field.