

## 2. Genetic confirmation of chromosomes involved in reciprocal translocations.

During recent years a large number of reciprocal translocations in maize have been accumulated. The cytological positions of the interchange points of most of these have been investigated by Dr. A. E. Longley. In most cases, however, little or no information is available on their genetic relations or transmission. The present study was initiated to obtain genetic confirmation of the chromosomes involved in some of these translocations.

In the translocations which follow, recombination studies were confined to markers which can be classified either as kernel or as seedling traits in order to eliminate the need for growing plants to maturity. The selection of markers was restricted to immediately available combinations in which the markers can be accurately classified together.

The data are tabulated in a manner similar to the form used in the 1935 Maize Linkage Summary. The cytological determinations are those of Dr. Longley, most of which have been listed in past issues of the Maize News Letter. The linkage phases of the various crosses are indicated, together with a notation of whether the  $F_1$  was used as male or female parent. Most of the data are from testcrosses either in coupling (CB) or repulsion (RB) phase. The designation "BS" indicates that the progeny represents a testcross for one marker and an  $F_2$  for the other.

Unless otherwise indicated, the data are from plants heterozygous for a translocation. Several crosses involve homozygous translocations; these are indicated by the notation T/T. Linkage data from male-transmission involving duplicate-deficient plants (symbol DD in the table) have also been included. The locus of the deficiency (one interchange point) is indicated by the symbol Df. On the assumption that the deficiency is not male-transmitted, the transmission of a linked gene is a function of recombination between the gene locus and the deficiency.

Aneuploid complements are female-transmitted in numerous instances. In a few cases, the aneuploid types are known from cytological investigation of the progeny to be duplicate-deficients arising from adjacent-1 disjunction of the heterozygous translocation. In other cases, evidence for functioning of aneuploid eggs is provided by the variable transmission of parental alleles in various linkage phases and in reciprocal crosses, correlated with observations of abortive pollen types. It is probable that a second type of aneuploids, trisomics, is produced in some instances as a result of 3:1 disjunction of the translocation heterozygote. Many of the recombination values given in the table are undoubtedly distorted by such events. Some instances of unequal classes in the table are, however, related to differential survival, e.g., reduced germination of su kernels. Some of the data suggest that

Table 1. Recombination in plants carrying reciprocal translocations.

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Total	Recombinants No.	Recombinants %	Additional Information
				XY	Xy	xY	xy				
2-4a	2L.29	su <sub>1</sub> gl <sub>2</sub>	RB♀	209	251	202	154	816	363	44.5	su <sub>1</sub> 3.3 T 14.0 Tu
	4L.16	lg <sub>1</sub> gl <sub>2</sub>	CB♀	133	17	45	149	344	62	18.0	
2-4b	2L.88	lg <sub>1</sub> "	CB♂	101	17	10	83	211	27	12.8	Tu 5.0 gl <sub>3</sub> 15.2 T
	4L.54	"	CB♀	109	20	24	142	295	44	14.9	
			Total	210	37	34	225	506	71	14.0	
2-4c	2L.77	su <sub>1</sub> v <sub>4</sub>	CB♀	99	29	17	42	187	46	24.6	su <sub>1</sub> 9.2 T 30.8 Tu
	4S.09	lg <sub>1</sub> gl <sub>2</sub>	CB♀	309	49	46	299	703	95	13.5	v <sub>4</sub> 19.9 T
2-4d	2S.20	su <sub>1</sub> v <sub>4</sub>	RB♀	16	32	18	10	76	26	34.2	B 18 T 6 v <sub>4</sub>
	4L.25	"	CB♀	71	33	32	48	184	65	35.3	su <sub>1</sub> 28.4 Tu 0.2 T
		"	Total	87	65	50	68	260	91	35.0	
2-4f	2L.78	su <sub>1</sub> v <sub>4</sub>	RB♀	72	196	185	46	499	118	23.6	su <sub>1</sub> 6.1 T 19.3 Tu
	4L.13	lg <sub>1</sub> gl <sub>2</sub>	CB♀	529	89	74	545	1237	163	13.2	
2-4g	2L.13	su <sub>1</sub> v <sub>4</sub>	CB♀	379	52	35	237	703	87	12.4	Ts <sub>5</sub> 7.1 T 2.7 su <sub>1</sub>
	4S.26	su <sub>1</sub> gl <sub>2</sub>	CB♀	525	234	183	359	1301	417	32.1	
		gl <sub>2</sub> v <sub>4</sub>	CB♀	270	119	144	170	703	263	37.4	
		lg <sub>1</sub> gl <sub>2</sub>	CB♀	271	54	50	223	598	104	17.4	
2-4j	2S.19	su <sub>1</sub> v <sub>4</sub>	RB♀	43	444	398	6	891	(49)	(5.5)	Functional aneuploid
	4L.30	su <sub>1</sub> gl <sub>2</sub>	RB♀	60	724	567	7	1358	6	1.5	eggs apparently pro-
		"	RB♂	3	183	150	4	340	(67)	(4.9)	duced. An inversion
		gl <sub>2</sub> v <sub>4</sub>	RB♀	437	1	4	449	891	7	1.2	probably involved.
	su <sub>1</sub> lg <sub>1</sub>	RB♀	9	82	68	0	159	4	2.6		
	lg <sub>1</sub> gl <sub>2</sub>	CB♀	73	4	3	79	159	5	0.6		
		CB♀	0	0	0	0	68su	(9)	(5.7)		
		CB♀	0	0	0	0	0	0	0	0.0	
		CB♀	7	4	3	79	159	7	4.4		

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals						Recombinants		Additional Information
				XY	Xy	xY	xy	Total	No.	%		
2-4k	2L.12 4L.18	su <sub>1</sub> v <sub>4</sub>	RBQ	14	32	10	0	56	14	25.0		
			RBSQ	46	33	29	0	108	351	8.0*		
			RBQ	226	327	206	125	884	13	39.7		
2-4l	2L.56 4S.51	su <sub>1</sub> gl-2	CBQ	17	6	7	26	56	13	23.2		
			CBSQ	46	11	29	22	108	80	29.0		
			CBQ	186	43	37	201	467	17.1	17.1		
2-4m	2S.08 4S.16	su <sub>1</sub> v <sub>4</sub>	RBQ	16	28	10	2	56	18	32.1		
			RBSQ	33	20	41	4	98	27	20.0		
			CBQ	58	13	14	69	154	17.5	17.5		
2-4n	2S.08 4S.16	su <sub>1</sub> v <sub>4</sub>	RBQ	4	20	26	13	63	17	27.0	Aneuploids may be transmitted	
			RBSQ	5	110	107	0	222	5	2.3		
			Total	9	130	133	13	285	22	7.7		
			RBQ	62	47	137	20	266	117	22.0		
			RBSQ	78	138	96	39	351	82	33.3		
			CBQ	45	45	37	75	202	71	40.6		
			Total	81	40	31	70	222	153	32.0		
			CBQ	126	85	68	145	424	113	36.1		
			RBQ	209	58	55	235	557	398	20.3		
			CBQ	204	192	206	178	780	386	51.0		
2-4 4374-7	2L.15 4L.23	su <sub>1</sub> v <sub>4</sub>	CBQ	225	177	209	140	751	386	51.4	Cytology probably wrong.	
2-4 6266-7	2L.45 4L.20	su <sub>1</sub> v <sub>4</sub>	CBQ	225	177	209	140	751	386	51.4	Cytology may be wrong.	

\*If one double recessive had occurred.

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Recombinants		Additional Information
				XY	Xy	xy	Total	No.	%	
2-5a	2L,16	pr v <sub>4</sub>	CBS♀	25	5	36	10	76	44.0	cent-T 7.3 v <sub>4</sub>
	5L,18	"	CBS♂	165	25	133	75	398	27.0	
		"	Total	190	30	169	85	474	29.0	
2-5b	2L,02	pr v <sub>4</sub>	CBS♀	52	15	61	11	139	59.0	
	5S,02									
2-5e	2S,12	lg <sub>1</sub> gl <sub>2</sub>	CB♀	32	5	4	29	70	12.9	sk - T = 15.1 T - v <sub>4</sub> = 2
	5S,23	"	CB♂	45	12	12	42	111	21.6	
		"	Total	77	17	16	71	181	18.2	
2-6b	2S,69	y gl <sub>2</sub>	CB♀	50	34	35	43	162	42.6	Probable order: gl <sub>2</sub> - T - B Pl 7.7 sm 3.7 T
	6L,49	lg <sub>1</sub> gl <sub>2</sub>	CB♀	76	6	9	71	162	9.3	
2-6c	2L,32	y gl <sub>2</sub>	RB♀	387	488	449	313	1637	42.8	ts <sub>1</sub> 12.3 T 1.7 v <sub>4</sub> T 5.0 Pl 6.0 sm
	6L,20	lg <sub>1</sub> gl <sub>2</sub>	CB♀	706	110	130	691	1637	14.7	
2-6d	2L,52	y v <sub>4</sub>	CB♀	188	32	26	120	366	15.8	T - v <sub>4</sub> = 4.2 T 5.2 Pl 6.9 sm
	6L,57	"	CB♂	142	6	2	112	262	3.1	
		"	Total	330	38	28	232	628	10.5	
		lg <sub>1</sub> gl <sub>2</sub>	CB♀	79	7	9	64	159	10.1	
2-6e	2L,28	y gl <sub>2</sub>	RB♀	6	48	47	12	113	15.9	gl <sub>2</sub> -B-T; near B T 4.7 Y 5.2 Pl T apparently in 2S
	6L,22	y lg <sub>1</sub>	RB♀	19	35	37	22	113	36.3	
		lg <sub>1</sub> gl <sub>2</sub>	CB♀	42	14	11	46	113	22.1	

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Recombinants		Additional Information	
				XY	Xy	xY	xy	Total	No.		%
2-9a	2S,48 9L,85	c wx wx lg1 wx gl2 wx v4 gl2 v4 lg1 gl2	CB♀ RB♀ RB♀ RBS♀ CBS♀ CB♀	161	55	44	143	403	99	24.6	wx 35.6 T B 1.2 sk 1.2 T
				192	267	241	233	933	425	45.6	
				170	289	296	178	933	348	37.3	
				55	28	61	19	163		41.0	
2-9b	2S,12 9L,12 ST	wx v4 wx gl2 gl2 v4 lg1 gl2	CB♀ RB♀ RB♀ CB♀	64	15	7	68	154	22	14.3	wx 7.5 T ts1 5.0 T 7.8 v4
				76	135	115	72	398	148	37.2	
				26	50	45	33	154	59	38.3	
				154	27	23	152	356	50	14.0	
2-9 6656-1	2L,32 9S,31	wx v4 lg1 gl2	CBS♀ CB♀	21	4	23	6	54		sh1 11 wx 1.4 T	
				175	39	39	168	421	78		18.5
2-10a	2L,17 10L,53	R gl2 lg1 gl2	RB♀ CB♀	45	58	50	32	185	77	41.6	T 1.8 gl1 8.1 R ts1 13.5 T cent-T 6.5 v4
				79	19	16	71	185	35	18.9	
2-10b	2S,45 10L,77	R v4 R gl2 gl2 v4	CB♀ CB♀ CB♀	239	140	97	134	610	237	38.9	Probable orders: gl2 - T - B cent - R - T 2 10 <sup>2</sup> probably female-transmitted
				311	68	41	190	231r	97	42.0	
								610	109	17.9	
				218	134	118	140	231r 258gl 610 258gl	41 68 252 118	17.7 26.4 41.3 45.7	
4-5a	4L,19 5S,29	su1 pr	CB♀	173	82	*	*	255Su	82	32.2	

\*sugary kernels not classified

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Recombinants		Additional Information	
				XY	Xy	xy	Total	No.	%		
4-5d	4S.21 5L.19	su <sub>1</sub> pr	RB♀	4	58	49	2	113	6	5.3	su <sub>1</sub> 3.4 T - cent bm <sub>1</sub> 2.5 T su <sub>1</sub> -bm <sub>1</sub> linked in T/T
4-5h	4L.30 5L.08	su <sub>1</sub> pr su <sub>1</sub> pr	CB♀ RB♀ T/T	325 110	66 384	--352-- 379	112	391Su 985	66 222	16.9 22.5	T closer to su <sub>1</sub> than to pr
4-5i	4L.10 5S.13	su <sub>1</sub> pr	CB♀	214	86	57	192	549	143	26.0	T closer to su <sub>1</sub> than to pr
4-6a	4L.33 6L.44	su <sub>1</sub> y " "	RB♀ CB♀ Total	4 492	125 19	133 24	6 475	268 1010 1278	10 43 53	3.7 4.3 4.1	Ts <sub>5</sub> 14.9 su <sub>1</sub> 4.9 T Y 1.3 T 5.3 Pl su <sub>1</sub> 19.7 Pl in T/T
4-6b	4S.71 6L.25	su <sub>1</sub> y su <sub>1</sub> Df	RB♀ CB♂ DD	150 ---	354 63	603 --475--	26	380y 538	26 63	6.8 11.7*	Ts <sub>5</sub> 1.6 T 8.6 su <sub>1</sub> T 5.6 Y 9.3 Pl 4 6 female-transmitted
4-6c	4S.13 6S.86	su <sub>1</sub> y	CB♀	1347	127	58	820	878su	58	6.6	su <sub>1</sub> 8.6 T 31.2 Tu T 8.4 Y 23.0 Pl 4 6 probably female- transmitted
4-6e	4S.60 6L.51	su <sub>1</sub> y	CB♀	168	101	100	135	504	201	39.9	
4-6	4S.37 43/41-5 6S.81	su <sub>1</sub> y	RB♀	82	418	414	16	430su	16	3.7	4 6 probably female- transmitted

\*If deficiency not male-transmitted



Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Recombinants		Additional Information	
				XY	Xy	xy	Total	No.	%		
4-9	4L.29 4373-2 9L.39	su <sub>1</sub> C	CB♀	378	220	216	387	1201	436	36.3	
4-9	4L.33	su <sub>1</sub> C	RB♀	101	478	470	59	1108	160	14.4	C 12.4 wx 1.8 T
5657-2	9S.25	"	CB♀	129	34	34	127	314	68	21.7	
		"	Total					1422	228	16.0	
		"	CB♂	111	75	71	118	375	146	38.9	
		C wx	RB♀ T/T	856	1540	1668	796	4860	1652	34.0	
		"	RB♂ T/T	847	1480	1671	756	4754	1603	33.7	
		"	Total	1703	3020	3339	1552	9614	3255	33.9	
4-9	4S.24	su <sub>1</sub> C	RB♀	21	49	51	18	139	39	28.1	
5918-4	9L.18	"	RB♂	58	123	127	62	370	120	32.4	
		"	Total	79	172	178	80	509	159	31.2	
4-9	4L.03	su <sub>1</sub> C	RB♀	9	141	145	77	1540	9	5.8	C 3.3 T 0.3 sh <sub>1</sub> 6.3 wx 4 94 female-transmitted. Order: su <sub>1</sub> - cent - T
6222-1	9S.68	"									
4-10b	4L.18 10L.57	su <sub>1</sub> R	CB♂	71	8	17	84	180	25	13.9	Ts <sub>5</sub> 15.0 su <sub>1</sub> 4.0 T T 1.6 g <sub>1</sub> ; T 8.6 R; g <sub>1</sub> 8.3 R
4-10e	4L.04 10L.01	su <sub>1</sub> R	RB♀	392	1395	1451	377	3615	769	21.3	T 22.8 R
		"	CB♀	318	80	77	354	829	157	18.9	
		"	RB♂	28	77	93	22	220	50	22.7	
		"	Total					4664	976	20.9	
		"	CB♀ T/T	184	51	48	190	473	99	20.9	
		"	CB♂ T/T	110	43	38	111	302	81	26.8	
		"	Total	294	94	86	301	775	180	23.2	

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals				Total	Recombinants		Additional Information
				XY	Xy	xY	xy		No.	%	
5-9d	5L.22 9L.15	pr wx	CB♀	138	11	16	127	292	27	9.2	
6-7a	6L.74 7L.61	y gl1	CB♀	322	293	312	298	1225	605	49.4	
6-7	6L.25 4545-5 7S.75	y gl1	CB♀	504	67	75	525	1171	142	12.1	
6-7	6L.22 4573-2 7L.27	y gl1 "	CB♀ CB♂ Total	418 148 566	35 6 41	9 11 20	339 181 520	801 346 1147	44 17 61	5.5 4.9 5.3	
6-7	6L.52 4594-10 7S.67	y gl1 "	CB♀ CB♂ Total	139 61 200	70 33 103	72 29 101	160 75 235	441 198 639	142 62 204	32.2 31.3 31.9	
6-7	6S.79 5181-6 7L.86	y gl1	CB♀	252	171	138	200	761	309	40.6	
6-9a	6S.79 9L.40	y wx " " " " " "	CB♀ CB♀ Total CB♂ CB♀ CB♀ CB♂	78 70 148 51 349 63 57 49	3 6 9 9 34 17 7 6	5 6 11 15 34 21 5 54	63 80 143 58 362 58 65 110	149 162 311 133 780 159 134 219 164y 55Y 103wx 116wx	8 12 20 24 68 38 12 (60) 54 6 54 6	5.4 7.4 6.4 18.0 8.7 23.9 9.0 (27.4) 32.9 10.9 52.4 5.2	Plant 2489-1 Plant 2489-4 Family 2489 Plant 2489-4 Family 2490 (except - 17) Plant 2490-17 Plant 2490-2 Plant 2490-2

Table 1. (Continued)

T	Cytol.	Genes	Link-age Phase	Number of Individuals				Recombinants		Additional Information	
				Xy	Xy	xY	xy	Total	No.		%
6-9a (Cont.)	6S.79	y wx	CB♂	32	11	7	25	75	18	24.0	Plant 2490-12 Other 2490 Non-homologous pairing, much crossover suppression, unequal recombination in male and female transmission have been reported.** Y 1.4 T 5.5 Pl wx 3.8 T
	9L.40	"	CB♂	74	11	9	110	204	(20)	(9.8)	
6-9b	6L.13 9S.42	y wx	CB♂	726	12	5	681	1424	17	1.2	Y - T = 0.0 Probable order: cent - T - Y
			CB♂	110	2	4	101	217	6	2.8	
			Total	836	14	9	782	1641	23	1.4	
			CB♀	317	34	43	283	677	77	11.4	
6-9d	6S.54 9L.76	y wx	CB♂	395	90	78	380	943	168	17.8	Y - T = 0.0 Probable order: cent - T - Y
			Total	712	124	121	663	1620	245	15.1	
6-9e	6L.17 9L.22	y wx	CB♀	114	58	49	133	354	107	30.2	Y - T = 0.0 Probable order: cent - T - Y
			CB♂	109	19	25	105	258	44	17.1	
			Total	223	77	74	231	612	151	24.7	
6-9e	6L.17 9L.22	y wx	CB♀	1880	110	112	1869	3971	222	5.6	Y - T = 0.0 Probable order: cent - T - Y
			CB♂	194	6	20	248	468	26	5.6	
			CB♀	143	72	57	136	408	129	31.6	
			CB♂	238	170	115	339	862	285	33.1	
6-9e	6L.17 9L.22	C wx	CB♀	161	54	44	149	3530	115	32.6	Y - T = 0.0 Probable order: cent - T - Y
			CB♂	300	109	106	348	408	98	24.0	
			Total	461	163	150	497	1271	215	24.9	
6-9e	6L.17 9L.22	C wx	CB♀	461	163	150	497	1271	313	24.6	Y - T = 0.0 Probable order: cent - T - Y
			CB♂	300	109	106	348	408	98	24.0	

\*If the deficiency is not male transmitted.  
 \*\*Previously reported recombination values: wx 11.6 T, T 4.9 Y (female transmission); T 17.3 Y (male transmission). It appears from the present study that 69 9 eggs function. Trisomic eggs (from 3:1 disjunction of the translocation heterozygote) are probably also produced. It is obvious that this translocation requires much more study, with special attention to verifying chromosome constitutions of parents and progeny.

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals			Recombinants		Additional Information		
				XY	Xy	xY	xy	No.		%	
6-9e (Cont.)	6L.17	y wx	RB♀ T/T	9	294	302	9	614	18	2.9	
	9L.22	C wx	CB♀ T/T	72	33	38	72	215	71	33.0	
		y C	RB♀ T/T	33	68	72	42	215	75	34.9	
6-9 4505-4	6L.13 9 near cent	y wx	CB♀	139	20	24	124	307	44	14.3	C 29.3 wx 2.9 T < 1.6 Y
6-9 4778-9	6S.80	y wx	CB♀	433	113	47	532	1125	160	14.2	6 <sup>9</sup> 9 female-transmitted
	9L.30	"	CB♂	425	14	18	471	480wx 928	47	9.8	
		y Df	CB♂ DD		48		325	373	48	3.4	
		"	CB♂ DD		13		289	302	13	12.9*	
		"	Total		61		614	675	61	4.3*	
		y wx	RB T/T		398		367	1495	746	9.0*	
6-10b	6L.17	y R	RB♀	108	548	537	111	1304	219	16.8	T 8.2 Pl 3.6 sm
	10L.14	"	CB♀	252	49	35	250	586	84	14.3	T 2.5 g1; T 18.6 R;
		"	Total					1890	303	16.0	g1 15.8 R
		"	CB♀ T/T	473	108	105	445	1131	213	18.8	Probable order: Y - T - Pl
6-10d	6L.15 10L.06	y R	CB♀	560	94	106	557	1317	200	15.2	
6-10e	6L.21	y R	RB♀	40	191	142	41	414	81	19.6	
	10S.62	"	RB♀	14	56	50	17	137	31	22.6	
		"	Total	54	247	192	58	551	112	20.3	
7-9a	7L.27 9L.20	g1 wx	CB♀	302	81	92	297	772	173	22.4	wx - T = 0.3 (575 plants)

\*If the deficiency is not male-transmitted.

\*If the deficiency is not male-transmitted.

Table 1. (Continued)

T	Cytol.	Genes XY	Link- age Phase	Number of Individuals			Recombinants		Additional Information		
				XY	Xy	xy	Total	No.		%	
7-9b	7S.92 9S.24	gl1 wx	CB♀	282	50	60	235	627	110	17.5	wx < 1 T - cent
7-9c	7L.16 9L.18	gl1 wx	CB♀	275	21	22	202	520	43	8.3	7/9 female-transmitted
7-9 4363-1	7 near cent 9 near cent	gl1 wx	CB♀	291	16	26	256	589	42	7.1	C 11.2 T 2.2 wx
		"	CB♂	230	11	14	180	435	25	5.7	
		Total	521	27	40	436	1024	67	6.5		
7-9 5074-9	7S.48 9L.53	gl1 wx	CB♀	154	48	41	172	415	89	21.4	
		"	CB♂	82	15	15	64	176	30	17.0	
		Total	236	63	56	236	591	119	20.1		
7-9 6225-2	7 near cent 9 near cent	gl1 wx	CB♀	171	10	35	154	370	45	12.2	
		"	CB♂	173	14	15	173	375	29	7.7	
		Total	344	24	50	327	745	74	9.9		
9-10b	9S.11 10S.28	wx R	RB♀	44	75	71	30	220	74	33.6	wx 5.7 T; T 16.3 g1; T 23.7 R; g1 8.9 R; T 8.8 g1 T previously reported in 9L, 10L
		"	CB♀	52	24	32	57	165	56	33.9	
		"	Total	96	99	103	87	385	130	33.8	
		"	RB♀ T/T	31	94	81	38	244	69	28.3	
		"	CB♀ T/T	71	26	24	72	193	50	25.9	
		"	Total	102	120	105	109	437	119	27.2	
9-10 5488-2	9L.57 10L.89	wx R	RB♂ T/T	464	971	944	594	2973	1058	35.6	Data from female trans- mission uncertain be- cause of apparent transmission of aneuploids.
		"	CB♀	52	24	32	57	1408R	464	33.0	
		"	Total	516	995	976	651	1565r	594	38.0	
		"	RB♂ T/T	31	94	81	38	1435Wx	464	32.3	
		"	CB♀ T/T	71	26	24	72	1538wx	594	38.6	

parental plants classified as being heterozygous for a translocation were in fact aneuploid. The indicated recombination values in these cases are obviously subject to correction.

Recombination values for markers in only one of the two translocated chromosomes have been included where relevant. Fairly extensive data on  $lg_1-gl_2$  recombination were obtained and are presented to indicate the variability encountered. These data should serve as a caution in comparing recombination values obtained in tests lacking adequate controls.

The last column of the table includes additional information provided by published or unpublished work of others, or derived from this or other phases of the present study.

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1. A genetic analysis of a duplication and a deficiency involving chromosomes 9 and 3.

Some years ago I received an aberration identified by Frances Clark Beard as one in which a segment from the long arm of chromosome 3 had been inserted into the short arm of 9. Inasmuch as this constituted a type of aberration not previously subjected to genetic analysis, a number of tests have been performed. The chromosome 3 deficient for a segment in the long arm is designated as Df 3 and the chromosome 9 with this piece inserted into the short arm is called Dp 9. Heterozygous plants of Dp 9/ N 9 Df 3/ N 3 constitution produce the following four kinds of spores in equal numbers: Dp 9 Df 3, Dp 9 N 3, N 9 Df 3, N 9 N 3. The N 9 Df 3 class of megaspores and microspores aborts. Female transmission of the remaining three classes is normal. When heterozygous plants are used as the pollen parent, the Dp 9 N 3 class of pollen is handicapped and functions infrequently. From backcrosses of Dp 9 Wx/ N 9 wx; Df 3 A/ N 3 a plants used as the egg parent the following data were obtained:

<u>A Wx</u>	<u>A wx</u>	<u>a Wx</u>	<u>a wx</u>	
2618	431	2409	2262	$\Sigma = 7720$
33.9%	5.6%	31.2%	29.3%	
% A = 39.5		% a = 60.5		
%Wx = 65.1		%wx = 34.9		