spores heterogeneous for color in each end of the ascus, were obtained during the course of this study (Fig. 2*B*). Analysis of the progeny demonstrated that these had not resulted from drastic nuclear or spore rearrangement, since other loci segregated in normal pairwise manner. The data indicate that two half-chromatids of paired homologs switched over in opposite directions and miscopied alleles simultaneously. We are referring to this as "reciprocal double transreplication."

A single $7g+:1g$ ascus was found. In this ascus other loci segregated normally. The unusual ratio is believed to have resulted from the combination of a 6:2 and a 5:3 event, but the two are difficult to explain as products of the same meiotic process. In view of this and the fact that 6:2 and 5:3 asci show a marked difference with regard to related crossing over, it may be that the two events have a different explanation, at least as to time of occurrence. If a 5:3 event occurred in the crozier within a diploid nucleus or between homologs of an intimately associated dikaryon which then divided once before producing the ascus nucleus, such an event would allow for a second DNA replication in the ascus and result in a 6:2 ratio. A 5:3 event in the ascus nucleus superimposed upon the foregoing occurrence could then give a 7:1 ratio. The data presently available are insufficient to determine whether this hypothesis is correct. If it should prove valid, then it would logically follow that transreplication in general is the result of miscopying by half-chromatids.

We have obtained several spore color mutants whose loci show no evidence of transreplication, possibly because they represent deletions or other chromosomal aberrations that are not subject to miscopying. On the other hand, one of our spore color mutants (*m*), when crossed with wild type, gives rise to 6:2 asci at the rate of about 1 in 1500, but no 5:3 asci have been found.

It is hoped that future studies may help explain these differences that have been observed among loci that are able to transreplicate and that they may further elucidate the underlying mechanism of the process (*4*).

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Stimulation of Uterine Contraction by Extracts of the Cockroach, Periplaneta

Abstract. Blood and extracts of gut of the American cockroach, *Periplaneta americana*, powerfully stimulate contractions of the isolated rat uterus. The contractions are characterized by long latency and a prolonged relaxation phase having superimposed rhythmic contractions. Evidence indicates that the stimulating factor is not acetylcholine, 5-hydroxytryptamine, histamine, or substance P. The active factor is heat labile and nondialyzable.

Stimulation of the rat uterus by blood of the roach, *Periplaneta americana*, was encountered by Barton Browne *et al.* (*1*). To determine the origin and characteristics of the stimulating principle, extracts were prepared from brain, nerve cord, muscle, gut, and blood of roaches, and were tested on the isolated rat uterus preparation. The roach tissues were ground in a small mortar with Tyrode's solution, then filtered. Undiluted blood was obtained by centrifugation of the roaches (*2*).

In each experiment, one uterine horn of a rat was suspended in a 7-ml bath containing low-calcium Tyrode's solution (*3*), and its isotonic contractions were recorded by a conventional lever exerting a slight load on the uterus. The muscle was stimulated at 4-min intervals by application of 0.5 to 2.0 μg of carbamylcholine chloride (carbachol). Extracts were applied 4 min after the routine stimulation and were allowed to remain in the bath for 60 to 90 sec. Thereafter, washing was repeated at 60-sec intervals until the next application of carbachol.

Only gut extracts and blood showed the characteristic stimulating activity, with gut showing greater activity per unit weight and being used in most experiments. Uteri responded to extracts from as little as one-tenth of a single washed gut. Figure 1 shows typical responses. The latent period after introduction of the extract into the bath varies from 45 to 120 sec, depending upon dosage. Maximum contraction is followed by a long period of slow relaxation, with spontaneous contractions superimposed. Higher doses, equivalent to extracts of several washed guts, cause uteri to go into short contracture, followed by relaxation phases of up to 1 hr. The degree of uterine contraction obtainable far exceeds the maximum contraction obtainable by application of carbachol.

The active principle was differentiated from acetylcholine and histamine. Both rat colon and blood pressure were insensitive to extracts of ten roach guts. Atropine, sufficient to render uteri insensitive to carbachol, did not reduce the contractions elicited by gut extracts. Uteri responding strongly to extract equivalent to one gut were insensitive to 100 μg of histamine, whereas the arterial pressure of the rat and cat showed a significant fall to only 1 to 2 μg of histamine but did not respond to large amounts of the extract.

5-Hydroxytryptamine (5-HT) and

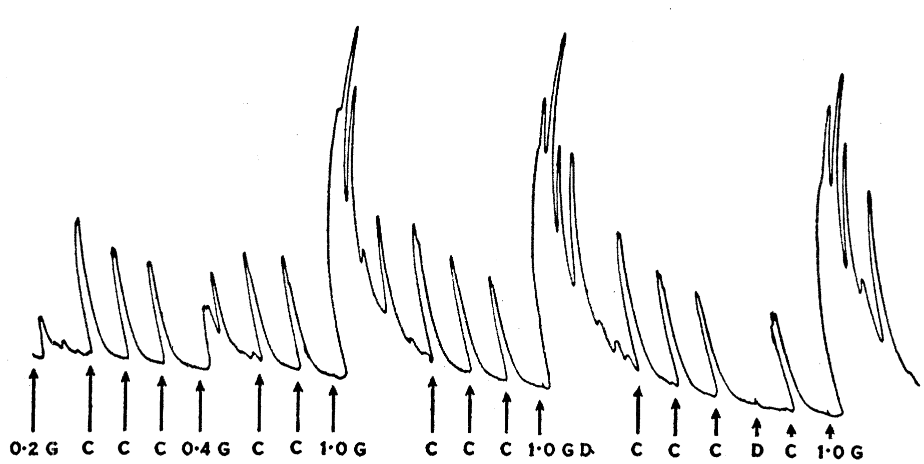

Fig. 1. The effects of dialyzed and nondialyzed extracts of roach gut upon isolated rat uterus. C, 1 μg carbachol; 0.2 G and 1.0 G, extracts equivalent to 1/5, 2/5, and 1 roach gut, respectively; 1.0 GD, dialyzed extract equivalent to 1 gut; D, dialyzate equivalent to 5 guts.

substance P could also be ruled out as the stimuli concerned. Contractions induced by 0.1 μg of 5-HT exhibited short latencies and fast relaxations, and blocking of 5-HT responses of uteri by lysergic acid or dihydroergotamine (*4*) did not change the effects of the extracts. The insensitivity of the rat colon to the extract is also in agreement with this evidence (*5*). Substance P is known to occur in extracts of brain and intestine of some mammals and to induce slow contractions of a number of smooth muscle preparations (*6*), but it is insensitive to heat, is dialyzable, and stimulates rat colon. Active roach extracts were found to be nondialyzable through cellophane (Fig. 1), and to be destroyed by heating above 50°C for 10 min, although stable for at least 24 hr at *p*H 5, 7, or 8 at room temperature.

Smooth muscle stimulants with prolonged effects somewhat resembling those of the roach gut extract have been reported from several tissues. Dalgliesh *et al.* (*5*) extracted from the small intestine of the horse a material designated substance C, which caused long contractions of guinea pig ileum. Various workers (*7*) have reported the production, during anaphylaxis, of a smooth muscle stimulating substance which has been called "slow reacting substance." A nondialyzable, heat-labile extract from the abdomen of the garden tiger moth, *Arctia caja*, has been found to cause constriction of bronchial smooth muscle when given intravenously to guinea pigs (*8*). It is not yet known whether the activity reported here might be due to high concentrations of any of those substances in roach gut and blood (*9*).

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Succession in Desert Vegetation on Streets of a Nevada Ghost Town

Abstract. Vegetation was sampled on the old street system of Wahmonie, Nevada, and on a less disturbed area immediately adjacent. The vegetation on the denuded upland site showed a large increase in bunch-grass and an invasion by pioneer shrubs which ordinarily are chiefly confined to dry washes.

Muller (*1*) and Shreve (*2*) have concluded from studies in the Chihuahuan and Sonoran deserts that plant succession is essentially lacking in desert vegetation. According to Shreve (*2*), if a desert plant community is destroyed, the earliest stage in the return of the vegetation will be the appearance of young plants of the former dominants. "Not only do the same species appear at the outset, but their first individuals ultimately constitute the restored community." Nevertheless, on the Nevada Test Site of the U.S. Atomic Energy Commission, in the northern Mohave Desert, there are a number of shrubs, sub-shrubs, and herbs which are unimportant on undisturbed upland sites in the desert, but which are ubiquitous weeds where the original vegetation has been destroyed by man. Many of the invading plants are natives of naturally disturbed desert habitats, chiefly dry washes; a few are weedy exotics, like *Salsola*. The Nevada Test Site is exceptionally well endowed with disturbed sites. Besides areas devastated by the detonation of nuclear devices, there are a variety of sites from which vegetation has been denuded by more prosaic, mechanical means. Unfortunately, most of the disturbed areas are of rather recent origin, dating from the past 10 years, or else are of indeterminate age. However, the discovery of horn silver in the Tertiary volcanics east of Jackass Flat in 1928 has fortuitously provided a quasi-experimental plot 33 years old. On the bajada south of Lookout Peak, Nye County, the townsite of ephemeral Wahmonie, Nevada, was platted as eight streets and five avenues (unpaved, ungraded), which are still in evidence, although buildings have long since disappeared. According to Murbarger (*3*), "automobile-borne miners began pouring out of Tonopah toward

Table 1. Comparison of desert vegetation on an abandoned street system 33 years old with that of an adjacent, less disturbed site. Density is given as plants per acre and frequency as percentage.

Streets of ghost town	Density	Frequency	Adjacent site	Density	Frequency
Stipa speciosa Trin. & Rupr.	1050	96	*Grayia spinosa* (Hook.) Moq.	1082	100
Ephedra nevadensis Wats.	378	86	*Lycium Andersonii* Gray	565	96
Lycium Andersonii Gray	351	74	*Larrea divaricata* Cav.	344	80
Thamnosma montana Torr. & Frém.	153	48	*Ephedra nevadensis* Wats.	264	70
Hymenoclea Salsola T. & G.	108	32	*Coleogyne ramosissima* Torr.	201	42
Salazaria mexicana Torr.	81	20	*Stipa speciosa* Trin. & Rupr.	138	44
Grayia spinosa (Hook.) Moq.	45	20	*Thamnosma montana* Torr. & Frem.	21	8
Acamptopappus Shockleyi Gray	32	8	*Acamptopappus Shockleyi* Gray	5	2
Larrea divaricata Cav.	18	6	*Eurotia lanata* (Pursh) Moq.	5	2
Coleogyne ramosissima Torr.	14	6	*Krameria parvifolia* Benth.	5	2
Dalea Fremontii Torr.	4	2	*Opuntia acanthocarpa* Englem. & Bigel.	5	2
Eurotia lanata (Pursh) Moq.	4	2	*Yucca brevifolia* Engelm.	5	2
Aplopappus Cooperi (Gray) Hall	4	2			
Krameria parvifolia Benth.	4	2			
Lepidium Fremontii Wats.	4	2			
Total	2250		Total	2640	