serum is no more toxic for man than is horse serum; immediate reactions do not occur with any greater frequency. Serum sickness has been infrequent and of a mild character.

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IDENTICAL TWINS IN A MOUSE CROSS

IN 1934 the late Dr. C. V. Green[1] published statistical evidence that there occur occasionally in mice uniovular twins, since pairs of individuals with identical color characters and of like sex occur more frequently than chance alone would indicate to be probable. Miss Bodemann[2] has also described and figured two mouse embryos in the primitive streak stage found enclosed within a common yolk sac endoderm layer, among the progeny of x-rayed mice, evidence which points to the same conclusion as that reached by Green.

We are able to support Green's conclusion with observational evidence of the occurrence of a pair of identical twins under conditions which render their identification all but unmistakable.

The genes for two recessive mutant characters (dilution (d) and short ear (se)) are borne in the same mouse autosome at closely adjacent loci. Gates (1928), who made a "repulsion" cross, observed no crossovers in an F_2 population of 426 individuals involving a test of 852 chromosomes. Snell (1928), however, in a similar but more extensive search for cross-overs reported the occurrence of one crossover in 1,158 cases; later in data hitherto unpublished he observed two crossovers in 890 cases. In backcross populations, Miss Copeland in 1931 reported the occurrence of one crossover in 106 cases, an observation confirmed by Snell, though he himself observed no crossovers among 1,034 backcross young. Combining these various observations, the indicated occurrence of crossovers up to 1931 was 4 in 4,040, or roughly 1 in 1,000 cases.

Subsequently, Castle, Gates, Reed and Law[3] made a cross in which short ear and dilution were introduced in the coupling relationship, reciprocal backcrosses being later made to the double recessive (d se) race. The observed recombinations and their respective frequencies were as follows:

	D Se	d Se	D se	d se
♀ F_1 × ♂ d se	827	2	0	792
♂ F_1 × ♀ d se	67	0	1	68
Totals	**894**	**2**	**1**	**860**

Three crossovers were thus observed in 1,757 cases, or about 1.75 to a thousand, a frequency somewhat greater than that previously reported, but based chiefly on the behavior of heterozygous females in which crossing over is known to be more frequent than in males. We may then safely conclude that the normal amount of crossing over between the loci for dilution and short ear is not over one or two for a thousand cases.

Besides the three crossover cases already reported, there was observed, in a backcross between a doubly heterozygous female and a double recessive male, a pair of dilute brown males having long ears and so belonging in the crossover class, d Se. Since a crossover has a probability of occurrence of only one or two in a thousand, the odds against the occurrence simultaneously in the same litter of two independent crossovers identical in sex and three independent color characters would be about 332 to 1, according to calculations made by Snell, the details of which need not be reported here.

We accordingly regard the conclusion as justified that the pair of long-eared dilute brown male individuals which occurred in the same backcross litter were in reality *identical twins* derived from the fertilization of a single egg in which a rare crossover had occurred between the loci for dilution and short ear.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW APPARATUS FOR CONSTANT TEMPERATURE

THE continuous maintenance of precise temperatures by the use of heating units is now a relatively simple matter, but the available temperatures dependent upon the controlled application of heat are necessarily above the temperature of the room in which the apparatus is kept. There is also equipment for maintaining fixed temperatures below room temperature by the use of refrigerating units. In connection with experimental work by the senior author, it was desired to have several chambers in which constant temperature could be maintained independently of room temperature, the temperature of one chamber would be independent of that of any other, and there would be complete flexibility within a wide range of low and high temperatures.

We have designed and had in satisfactory use for

[1] SCIENCE, 80: 616, December 28, 1934.
[2] *Anat. Record*, 62: 291–294, 1935.
[3] *Genetics*, 21: 310–323, July, 1936.