UNIOVULAR TWINS IN MICE

CASTLE, Gates, Reed and Snell[1] reported a probable case of identical twins in mice. Recently Stevens[2] has suggested that though the probability of the pair being both crossovers and also identical in two color factors and sex by chance combination is indeed small, the probability of a single crossover egg giving rise to monozygotic twins is also comparably small. It would be desirable to determine which of the two probabilities is more likely. Unfortunately, this can not be done because the necessary data are no longer available.

It may be well, however, to point out some consequences of Stevens's work which may be of interest to investigators watching for possible cases of identical twins in the laboratory mammals.

In a backcross population involving six pairs of non-linked genes (plus the sex difference) one expects 128 equiprobable genotypes. Stevens devised a scoring system whereby two genetically identical litter mates score *one,* three genetically identical litter mates score *two,* and so on. With 128 equiprobable genotypes the expected total score is 22.305 for the 180 litters of 1,030 mice which Stevens studied. Stevens's observed score was only seventeen; the 1,030 mice probably contained few, if any, pairs of uniovular twins.

Table I gives the total expected scores for various numbers of equiprobable genotypes in backcross populations. The scores are not corrected, but the corrections will never amount to a large percentage of the total score. The writer has used Stevens's formulae and data to calculate the components of the table. The calculated total score in each case is for his population of 1,030 mice arranged in the same litter sizes.

TABLE I

THE TOTAL EXPECTED SCORE (UNCORRECTED) FOR STEVENS'S POPULATION OF 1,030 MICE FOR VARIOUS EQUIPROBABLE GENOTYPES

No. of factor pairs	No. of equiprobable genotypes	Total expected score
4	16	158.511
5	32	83.519
6	64	42.989
7	128	21.729
8	256	10.925
9	512	5.487
10	1,024	2.278
11	2,048	1.379

It is clear that each additional factor pair doubles the number of equiprobable genotypes and halves (approximately) the total expected score. The standard deviation may be calculated for each total score, thus setting the upper limit of chance identities, an excess of which, in the observed score, could be considered evidence of uniovular twinning.

Investigators observing segregation of ten or more pairs of factors in large backcross populations can get a rough estimate from the table of the expected score per 1,000 mice and decide whether their observed score is sufficiently in excess of the expected to be considered evidence of uniovular twinning.

Where the frequency of uniovular twins is low, as in mice (less than seven pairs per thousand, according to Stevens), it will be necessary to study backcross populations segregating for ten or more pairs of factors so that the number of expected chance genetic identities will be small compared with the number of pairs of uniovular twins (if any). As backcrosses involving ten or more pairs of factors present grave practical difficulties, detection of possible uniovular twins in mice is likely to be accomplished by observation of embryos or by some new technique rather than by a study of backcross populations.

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[1] SCIENCE, 84 (2191): 580, December 25, 1936.
[2] *Annals of Eugenics,* 8: 70–73, 1937.

FRESH-WATER MEDUSAE IN ARKANSAS

ALTHOUGH reported from adjoining states (Oklahoma,[1] Missouri[2] and Texas[3]), there appear to be no records of fresh-water medusae in Arkansas. The following two records, although unaccompanied by specimens, indicate their presence. The first report is from a student (C.A.) who recognized *Obelia* medusae used in the elementary zoology laboratory as apparently the same as what he had seen in Blue Lake, near Prescott, Arkansas, late in the summer of 1927. There he had found thousands and kept a few alive for several days. His description of their form and movements left no doubt of his observation. The second report is from Professor W. C. Munn, of the State A. and M. College at Magnolia, Ark., who found thousands of medusae in a pond near Stamps, Arkansas, late in the summer of 1937. The pond, by an abandoned mill, has been used for storing pine logs for some 25 or 30 years. Specimens collected and preserved were unfortunately lost in transportation.

The sites from which the medusae are reported are within a hundred miles of Broken Bow, Oklahoma, where Ortenburger and Phillips (1931) found medusae, and approximately two hundred miles from Dallas, Texas, where Cheatum (1934) discovered the same form. The general similarity of this area suggests that the fresh-water medusae will also be found in the adjacent portion of Louisiana, from which they seem not to have been reported, and quite possibly, from the coastal plain area of Arkansas generally.

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[1] Ortenburger and Phillips, SCIENCE, 74: 222, 1931.
[2] Bennitt, *Amer. Nat.,* 66: 287–288, 1932; Atwood and Steyermark, *ibid.,* 71: 280, 1937.
[3] Cheatum, SCIENCE, 80: 528, 1934.