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Field Study of Ground Squirrel (*Citellus beecheyi*) in Relation to Sylvatic Plague.*

F. C. EVANS AND R. HOLDENRIED. (Introduced by K. F. Meyer.)

From the George Williams Hooper Foundation for Medical Research, University of California, San Francisco.

This investigation was carried on in 1940 at the Calaveras Reservoir, Alameda and Santa Clara Counties, California. (The area had already been designated as a sylvatic plague focus by the survey made in 1933.) This study involved the live-trapping and marking of 433 individual squirrels. Approximately 100 additional animals were obtained from the area for plague transmission experiments at the Hooper Foundation.

Young squirrels were first seen on May 20th and by the middle of June nearly all the young of the year had appeared. There was no evidence to suggest more than one litter per mother per year in this area, and the period from the beginning of breeding until the appearance of the young above ground was not much more than 2 months.

The young squirrels averaged about 100 g when they first appeared, but they grew rapidly and averaged more than 300 g by the middle of July. The average weight of adult females was 600 g and of adult males was 700 g.

Of the 433 marked squirrels, there were recorded movements for 82. The greatest distance moved was about 1300 yards, while the average of these 82 records was approximately 350 yards. The records include movements by 10% of the total number of marked adults and 22% of the total marked young. This suggests a greater tendency on the part of the young squirrels to move. That these movements are exploratory rather than migratory in nature is indicated by the fact that 45% of all squirrels included in the movement records returned to the area in which they were first captured.

The number of squirrels observed regularly for at least 3 months totalled 135. Of these 90% were never caught outside ranges of 300 yards in diameter and 70% remained within areas of not more than 100 yards in diameter. This significant fact strongly suggests that in the Calaveras Reservoir area the ground squirrel is a sedentary and not a migratory species.

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Fig. 1 illustrates the relative size and composition of the ground squirrel population in 6 consecutive months of the study. Greatest numbers were present in June, when the young squirrels first appeared. There was a steady decline in numbers from June to October. In October over 80% of the population consisted of young of the year.

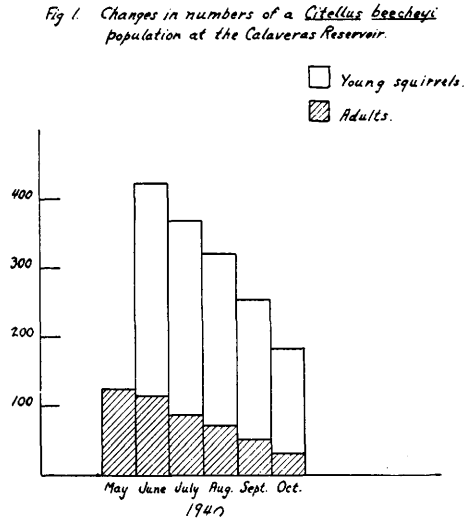

FIG. 1.

The apparently sedentary nature of the ground squirrel population and the fluctuations in numbers of individuals is of importance in determining the rôle of this species in the maintenance and spread of sylvatic plague. It is suggested (1) that extensive migrations of rodent hosts are not necessary for the spread of sylvatic plague, (2) that sylvatic plague in this country probably did not spread by such migrations, and (3) that the occurrence of plague in much of the western United States is due to a process of contact between individuals in a continuous population composed of many host species.