

Sadleir R M F S. The relationship between agonistic behaviour and population changes in the deermouse, *Peromyscus maniculatus* (Wagner).

J. Anim. Ecol. 34:331-52, 1965.

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Live trapping of deermice showed that numbers altered little during the summer then suddenly rose to a peak in the fall. There was a steady winter decline and some sudden drops in the spring. During breeding, males were aggressive to each other and sudden declines in numbers coincided with aggression peaks. As adults were antagonistic to juveniles, low juvenile recruitment during the breeding season was considered to be due to the aggressive behaviour of adults. [The SC¹ indicates that this paper has been cited in over 160 publications since 1965.]

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During the last year of my doctoral work, 1961, while living in Western Australia, I wrote to Dennis Chitty at the University of British Columbia in Vancouver asking to work with him to describe population changes throughout a complete lemming cycle. His reply told me that Charles Krebs had just started on exactly the same project, but otherwise I would be welcome! I arrived in Vancouver by ship in February 1962 and was immediately excited by Dennis's suggestions to look at *Peromyscus* populations and the role of behaviour in the regulation of numbers. Much to my advantage, John Eisenberg was also on the University of British Columbia faculty and was just starting to gain his subsequent high reputation as a comparative ethologist.¹ John, having worked on the behaviour of various *Peromyscus* species, gave me excellent advice on ethological techniques.

I was thus extremely lucky to be starting my first postdoctoral research in the academic atmosphere created by Dennis, John, and Charles. Dennis's international reputation was already well established, while John and Charles were just starting on

meteoric careers. We all had "fire in our bellies" and consuming interests in just what made populations "tick." The deermice proved to be very cooperative beasts so I was able, in a very short time, to show that their numbers in patches of forest fluctuated in similar seasonal patterns to those described by previous workers.^{2,3}

It took lots of fiddling around to devise a standard test of fighting between deermice, after being thoroughly thrashed in a fight, can remember that for at least a month.⁴ Eventually, I matched male field animals I wanted to test against laboratory males whom they had never met. One of the most enjoyable things I remember 20 years later was the observations of these fighting bouts. They were so decisive that there were very few in which a clear dominance wasn't expressed.

The severe antagonism of adults toward the young was a surprise. Perfectly healthy juveniles were converted to huddled shaking wrecks after a few encounters with resident adults.

My paper has been most quoted in articles on the regulation of rodent population numbers. The idea I put forward, that seasonal changes in the survival of juveniles were determined by seasonal changes in adult aggressiveness, has been widely accepted for *Peromyscus* and other rodent species. I am sure this acceptance was greatly strengthened by Mike Healey's follow-up work⁵ that strongly confirmed my speculations by excellent field data. Recent work on the population dynamics of *P. maniculatus*⁶ and *P. leucopus*⁷ has continued investigation along these lines, and the ideas have been used in a recent experimental investigation of snowshoe hares (*Lepus americanus*).⁸ The paper also attracted the interest of behavioural biologists, particularly those involved in the quantification of behaviour. I was amazed, in preparing this note, to find it quoted in papers in journals as diverse as *Comparative Biochemistry and Physiology*, *Folia Primatologica*, *Transactions of the American Fisheries Society*, and even, astonishingly, the *Journal of Dental Research*! One recent review article cited it as dealing in agnostic behaviour!

Two final personal comments. Having a peculiar spelling to my surname, I am used to interesting misquotations—over a third make it IE instead of EI. Four initials get jumbled all sorts of ways—I have been cited as RMFN, RMFD, and RNFS, amongst others! The question I have been most frequently asked is "Why four?"—my mother and father still couldn't agree as they walked into the church for my christening. In desperation, my father said, "Give him the lot," so I have been burdened with Richard Michael Francis Stuart!

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3. McCabe T T & Blanchard B D. *Three species of Peromyscus*. Santa Barbara, CA: Rood Associates, 1950. 136 p.
4. Sadleir R M F S. The establishment of a dominance rank order in male *Peromyscus maniculatus* and its stability with time. *Anim. Behav.* 18:55-9, 1970. (Cited 10 times.)
5. Healey M C. Aggression and self regulation of population size in deermice. *Ecology* 48:377-92, 1967. (Cited 140 times.)
6. King J A. Seasonal dispersal in a seminatural population of *Peromyscus maniculatus*. *Can. J. Zool.* 61:2740-50, 1983.
7. Adler G H & Tamarta R H. Demography and reproduction in island and mainland white-footed mice (*Peromyscus leucopus*) in southeastern Massachusetts. *Can. J. Zool.* 62:58-64, 1984.
8. Boutin S A. The effect of conspecifics on juvenile survival and recruitment of snowshoe hares. *J. Anim. Ecol.* 53:623-37, 1984.