

Letter from the Editor

Mice and rats: perceptions, realities, and impacts on humankind



Mickey and Minnie Mouse, Mighty Mouse, Stuart Little, Templeton, Ben, and Socrates. What do the names all have in common?

They are all fictitious portrayals of rodents that were endowed with human traits. No doubt the most famous of these are Mickey and Minnie Mouse. Created by Walt Disney in 1928, these anthropomorphic mice that wear human clothes are one of the world's most recognizable characters. The Mickey Mouse brand is estimated to have a net worth of >\$178 billion. Though originally characterized as a rogue, Mickey was rebranded as a nice person, and ultimately a hero. In 2009, Disney began to rebranding Mickey, reintroducing him as a more menacing character in the video game *Epic Mickey*.

Stuart Little, another anthropomorphic mouse in human clothes, was featured in a Columbia Studios motion picture of the same name. The movie generated >\$300 million at the box office, and triple that in retail merchandise sales.

Templeton, Ben, and Socrates are rats! Templeton made his debut in the Paramount Pictures movie *Charlotte's Web*, which was based on the 1952 E. B. White book of the same name. Templeton is a talking rat who only helped the main characters if offered food. Ben and Socrates were main characters in the 1971 horror movie *Willard*. Willard, the human in the movie, controlled Ben, Socrates, and their rat hoards with food, until he ultimately became their food.

Unfortunately, these characters, fashioned and then marketed to feast on basic human emotions and needs, have served to fuel public misperceptions about rodents in general. All of

the characters mentioned above are commensal rodents! In this issue of *Human–Wildlife Interactions*, we have devoted a special section to dispelling some of the myths about commensal rodents and another section about management of the damage caused by commensal rodents.

Dr. Gary Witmer, in the opening paper, identified the Norway rat (*Rattus norvegicus*), the ship or black rat (*R. rattus*), the Polynesian rat or kiore (*R. exulans*), and the house mouse (*Mus musculus* and *M. domesticus*) as commensal rodents. These species live and often thrive in close proximity to humans, exploiting the favorable conditions we have created for them (Witmer 2019). These species, except for the kiore, are considered cosmopolitan, in that they have spread globally. As such, they now cause greater economic losses to stored food stuffs through consumption and contamination than any other vertebrate species. In 1982, the United Nations estimated that rats destroyed >42 million tons of food, worth an estimated \$30 billion USD. In Asia alone, the amount of grain eaten by rodents would feed >200 million Asians for a year (Singleton et al. 2003). Pimentel et al. (2000) estimated the economic damage caused by rats alone in the United States exceeded \$19 billion USD per year.

They also are the primary source of increased human health and safety risk because of the diseases they spread. Rodents and their diseases have humbled some of the greatest armies in the history of the world. Arguably, the more infamous was the impact that bubonic plague spread by fleas that fed on infested rats that followed Napoleon and his armies

throughout Europe. The French doctors knew they were dealing with bubonic plague from the beginning (Herold 1962) but did not want to panic the soldiers, so they assured them it was not the plague. Napoleon especially feared plague because he recognized that it could destroy his entire army (Malus 1892).

Ignoring or attempting to hide the economic losses or health and safety risks caused by commensal rodents will not make them go away. Rodenticides have been heavily relied upon globally to control commensal rodent populations. However, the use of rodenticides is coming under increased public scrutiny (Quinn et al. 2019). In addition, reliance on a single method may lead to declining effectiveness over time (Witmer 2019). Ultimately, the development and implementation of an integrated pest management program may provide the best guarantee of a sustainable control program (Witmer 2007).

As human populations grow and the effects of climate change are realized, commensal rodents will pose increased challenges to land and resource managers, farmers, ranchers, homeowners, and local communities. Many tools that are available to reduce rodent populations and associated damage are discussed in this issue. However, public and professional awareness, education, and continued technology development and transfer will be paramount to improving the effectiveness and safety of methods used to control or eradicate commensal and invasive rodents and their damage to humankind.

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Literature cited

- Herold, J. C. 1962. *Bonaparte in Egypt*. Harper & Row, New York, New York, USA.
- Malus, E.-L. 1892. *L'Agenda de Malus*. Paris.
- Quinn N., S. I. Kenmuir, and L. Krueger. 2019. A California without rodenticides: challenges for commensal rodent management in the future. *Human–Wildlife Interactions* 13:212–225.
- Pimentel, D., L. Lach, R. Zuniga, and D. Morrison. 2000. Environmental and economic costs of non-indigenous species in the United States. *Bioscience* 50:53–65.
- Singleton, G. R., L. Hinds, C. Krebs, and D. Spratt. 2003. *Rats, mice and people: rodent biology and management*. Clarus Design, Canberra, Australia.
- Witmer, G. 2007. The ecology of vertebrate pests and integrated pest management (IMP). Pages 393–410 in M. Kogan and P. Jepson, editors. *Perspectives in ecological theory and integrated pest management*. Cambridge University Press, Cambridge, United Kingdom.
- Witmer, G. 2019. The changing role of rodenticides and their alternatives in the management of commensal rodents. *Human–Wildlife Interactions* 13:186–199.