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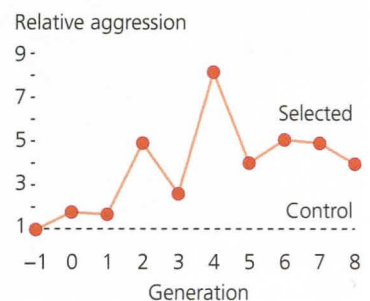
The Evolution of Social Behavior

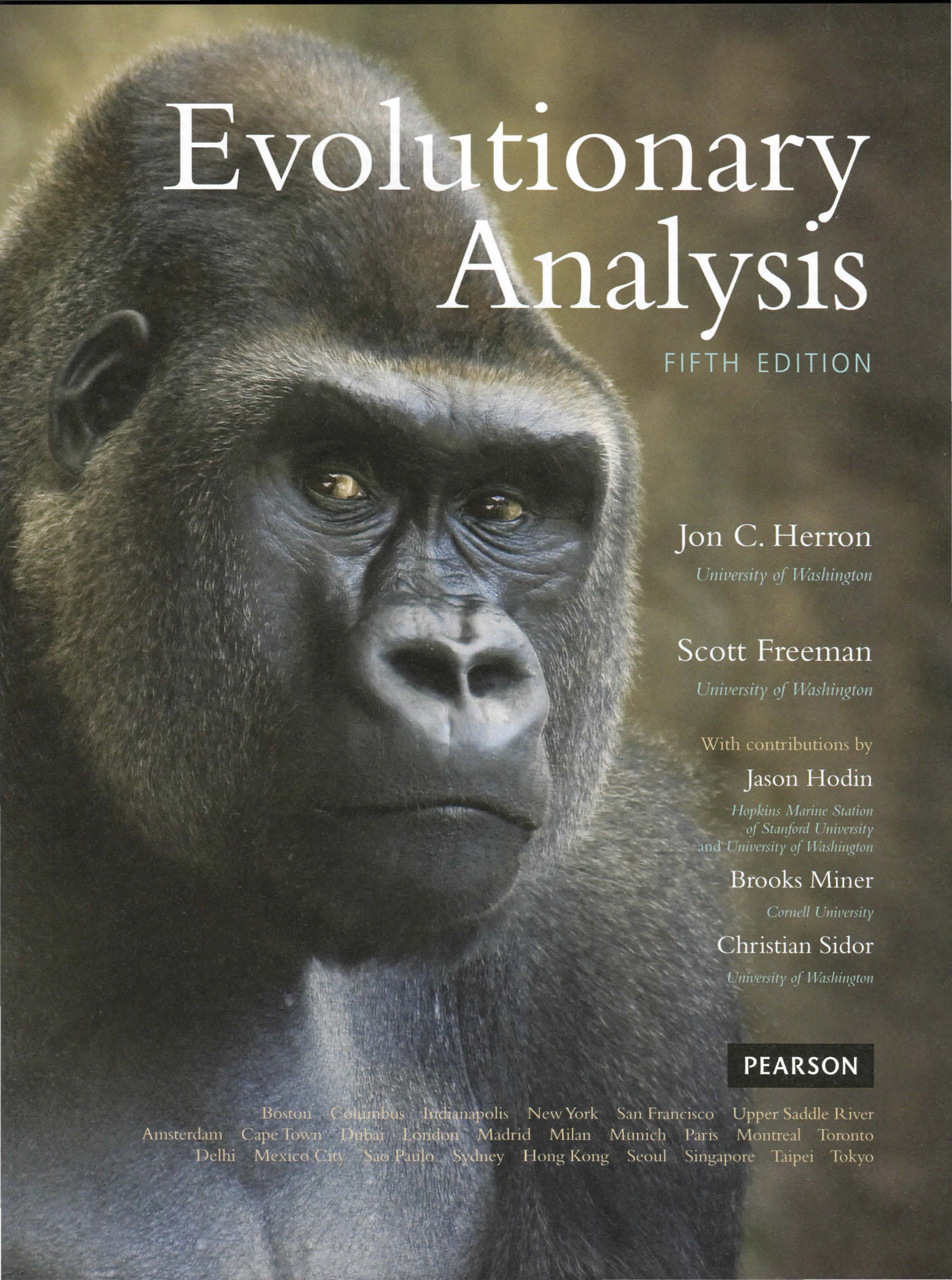
Female house mice (*Mus domesticus*) aggressively defend their pups against same-species intruders. When Stephen Gammie and colleagues (2006) counted the seconds lactating mothers spent attacking intruding males during 3-minute trials, they found that some females defend their pups more aggressively than others. Based on the resemblance between mothers and daughters, the researchers estimated that about 60% of the variation among females in their outbred lab population was due to differences in genes.

Gammie and colleagues then randomly assigned mice to a control line and a selected line. Each generation, the researchers chose females at random from the control line and kept their offspring as breeders. For the selected line, they kept the offspring of the most aggressive female in each family. By the eighth generation, the females in the selected line were defending their pups significantly more vigorously than the females in the control line. On average they spent 15 seconds attacking intruding males, whereas the control females spent just 3.77. The brains of the selected mice showed altered expression of a number of genes, including the neuropeptide neurotensin (Gammie et al. 2007; Gammie et al. 2009).

The results of this artificial selection experiment, summarized in the graph at right, show that social behavior evolves by the same mechanism as other traits.

Maternal defense of pups evolves in response to artificial selection in house mice. In the graph, relative aggression of the selected line is calculated as the average duration of attacks on intruders divided by the average duration for the control line. Plotted with data from Gammie et al. (2006).





Evolutionary Analysis

FIFTH EDITION

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