



FIGURE 15.2. On average, in a population of constant size, each gene leaves one copy in the next generation. However, the actual number varies randomly, and so the lineage will eventually go extinct. (A) In this example, one gene leaves three daughters; one daughter leaves two offspring, one none, and the third daughter leaves one; only one of the granddaughters reproduces, and none of her offspring reproduce, so that this genetic lineage has gone extinct after three generations. (B) This shows 20 random lineages, each starting with one copy. Most die out in a few generations and are never present in more than a few copies. However, one lineage (*blue*) rises to 53 individuals before dying out after 138 generations; another lineage (*orange*) reaches 83 individuals and persists for 255 generations. (Numbers are plotted on a log scale because they range so widely; usually only a few copies are present, but numbers can occasionally grow large.) (C) The chance that the descendants of a single gene copy will survive decreases over time: For example, the chance of surviving for 50 generations is only 3.8%. (Numbers of offspring genes are assumed to follow a Poisson distribution with average 1.)