



**FIGURE 17.5.** The increase in mean fitness caused by selection on allele frequencies equals the additive genetic variance in fitness. The diagram shows a population consisting of many genomes, each with its own individual fitness (shown at *right*). Each allele has its own average fitness; for example, the allele shown in *red* has fitness slightly higher than the population mean  $\bar{W}$  (*red dashed line*). It is each allele's average fitness that determines changes in its frequency and that contributes to the additive genetic variance in fitness. (In Chapter 14, we defined these averages in two ways—**average excess** and **average effect**—which for our purposes are equivalent.)