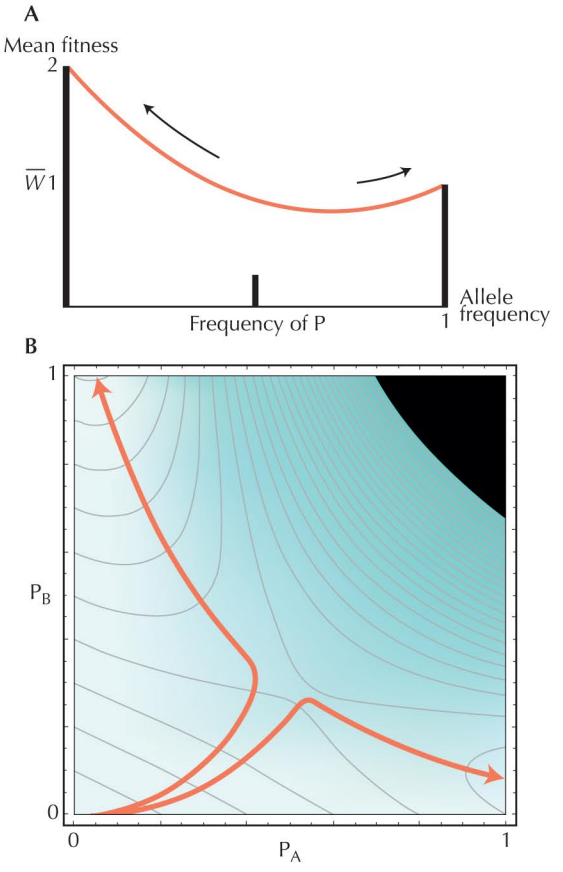

FIGURE 17.21. The effects of selection can be understood by plotting an adaptive landscape, which is a plot of mean fitness against allele frequency. (*A*) If heterozygotes are less fit than the homozygotes, the population will evolve uphill (*arrows*) to fix one or the other allele. The genotypes QQ, PQ, and PP have fitnesses 2, 0.25, and 1 (*vertical bars*). (*B*) An example with two loci, each with two alleles (A^P, A^Q at locus A; B^P, B^Q at locus B). Each copy of allele A^P adds 5% to fitness, and each copy of B^P adds 10%. However, the double homozygote $A^PB^PB^PB^P$ is lethal. Thus, there are two alternative adaptive peaks, one near fixation for A^QB^P with mean fitness 1.2 (*top left*) and the other near fixation for A^PB^Q with mean fitness 1.1 (*bottom right*). The *arrows* show the trajectory of populations that start with predominantly A^QB^Q. These may evolve to either adaptive peak depending on exactly where they start. Contours are spaced at intervals of mean fitness of 0.02. (These landscapes plot mean fitness against the state of the population, whereas the landscape in Fig. 17.12 plots individual fitness against individual phenotype.)