FIGURE 19.17. (A) Fixation of a favorable mutation at one locus will sweep variability out of a region of genome. Initially, a favorable mutation (blue dot) arises in one particular genome (blue line, top row). Eventually, the mutation fixes in the whole population, along with a fragment of the original genome. Thus, variation is swept out of a short region around the mutation. (B) The solid lines show the genealogy of four genes at the selected locus. These must coalesce during the sweep, because they all must carry the new mutation. The dashed lines show the ancestry of a sample of closely linked genes. Three of these stay with the selected mutation, but the leftmost lineage recombines away and has a different ancestry. (C) A simulation of genetic variability along 40 kb of genome soon after fixation of a favorable mutation at the center (20 kb), showing the nucleotide diversity $\pi$. Under the neutral theory, we expect $\pi = \theta = 4N_e\mu = 0.005$.