We study cosmic-ray acceleration in a supernova remnant (SNR) and the escape from it. We model non-thermal particle and photon spectra for old-age SNRs. We assume that the SNR shock propagates in a low-density cavity, which is created and heated through the activities of the progenitor stars and/or previous supernova explosions. We indicate that the diffusion coefficient for cosmic rays around the SNRs is less than ~1% of that away from them. We compare our predictions with the gamma-ray spectra of molecular clouds illuminated by the cosmic rays (Fermi and H.E.S.S.). We found that the spectral indices of the particles are ~2.3. This may be because even high-energy particles could be accelerated at the old SNRs, and because energy-dependent escape and propagation of particles did not much affect the spectrum.