Photoejection with excitation in $H^-$ and other systems A.K. Bhatia, R.J. Drachman, NASA/Goddard Space Flight Center — Lyman-alpha radiation, 1216 Angstrom, has been seen from the sun and from various other sources. This radiation arises from the radiative transition from the $2p^2P$ state to $1s^2S$ state of the hydrogen atom. The $2P$ state can be excited from the $1s^2S$ state by electron impact. However, it is also possible to produce this excited state by photodetachment of the $H^-$ ion, leaving the $H$ atom in the $2P$ state. We have calculated cross sections for this process using Hylleraas-type functions for the $H^-$ ion and using the exchange approximation for the photoelectron in the final states of angular momentum equal to 0 and 2. The photoabsorption cross sections in $H^-$ ions and $He$ atoms leaving the hydrogen and helium in $^2S$ are also calculated. Similar calculations have been carried out for the $Li^+$, $Be^{2+}$ and $C^{4+}$ ions.