Likens *et al.* argue that acid rain is leaching base cations from the soils of Hubbard Brook Experimental Forest, leading to slower-than-expected recovery of soils and streamwaters in response to reduced acid deposition. This result should be considered in the context of previously published data from other sites, and previously published analyses for Hubbard Brook itself.

Four years ago, I proposed (*1*) that the declining base cation concentrations in Hubbard Brook were caused by depletion of exchangeable bases from the catchment's soils, in combination with the direct effects of declining acid deposition. Likens *et al.* confirm this, using a longer and more detailed data set. I derived a simple mathematical relationship linking soil base cation depletion to base cation declines in streamwater and calculated that soils at Hubbard Brook were losing 40 ± 12 micromoles of calcium and magnesium (consisting mostly of calcium) per square meter per year. Likens *et al.* independently estimate calcium depletion rates at 31 to 46 micromoles per square meter per year.

Hubbard Brook is just one of many acid-sensitive sites where catchment base cation depletion has been observed (*2, 3*). At several Norwegian watersheds, where surface water quality has not measurably improved despite marked reductions in acid deposition, rates of soil base cation depletion are clearly correlated with acid loading (*3*). Although water quality has not improved at these sites, reductions in acid deposition have been beneficial, because they have compensated for ongoing acidification resulting from base cation leaching (*3*).

These observations indicate that, at many sites, acid deposition is leaching bases from soils faster than they are resupplied by mineral weathering, thus impeding the recovery of soils and surface waters from acidification. Emission controls on acid precursors are yielding measurable environmental benefits, but we should not expect the acid rain problem to go away any time soon.

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Response: Frink raises an old "red herring" (*1*) of acid rain research. We agree that soils (spodosols) like those at the Hubbard Brook Experimental Forest are naturally acidic because of the limited supply of base cations from weathering, the accumulation of nutrient cations by vegetation, and the large production of organic acids from litter decomposition. Nevertheless, atmospheric inputs of acidic sulfate and nitrate are anything but trivial and clearly have had major chemical consequences on soil and drainage water in acid-sensitive watersheds of eastern North America. Sulfate is the major anion associated with elevated acidity in precipitation at Hubbard Brook. Wet and dry deposition of sulfate and associated acidity at this site are derived largely from anthropogenic emissions of sulfur dioxide (*2*). Streamwater and soil solutions there are also highly acidic. The major anion associated with drainage water acidity is sulfate, and this sulfate is derived largely from atmospheric deposition (*3*). Indeed, annual losses of base cations in streamwater during the past 32 years are highly correlated (r^2 = 0.94) with losses of sulfate plus nitrate in