the modeled incremental concentrations due to the local source, because the dry deposition rate is expected to be proportional to the ambient concentration (see, for example, Granat and Söderlund, 1975). However, these estimated concentrations and depositions assume linear chemistry and, consequently, additivity of the effects of individual sources.

Somewhat more experimental information is available on wet deposition due to point sources. In examining the evidence in the literature, one must distinguish between wet removal during a precipitation event and climatological averages. For example, a high rate of removal during precipitation might result in a climatologically averaged removal of only a few percent since precipitation occurs only a small fraction of the time. Some of the available studies of precipitation scavenging of power plant, smelter and other plumes (Granat and Rodhe, 1973; Summers and Hitchon, 1973; Hutcheson and Hall, 1974; Larson et al., 1975; Granat and Söderlund, 1975; Dana et al., 1975; Wiebe and Whelpdale, 1977, Enger and Högström, 1979; Chan et al., 1981) have shown detectable effects on precipitation chemistry out to as far as 100 km. These studies suggest that smelter plume particulates are removed very efficiently during rainy days (Larson et al., 1975; Wiebe and Whelpdale, 1977; Chan et al., 1981). "Bulk" deposition (i.e., wet plus an unknown portion of dry deposition) experiments over periods of several months around the INCO smelter at Sudbury (Mueller and Kramer, 1977; Scheider et al., 1981) give similar results. The fate of the emitted sulfur is less understood, and different investigators have come to conflicting conclusions. For example, Granat and Rhode (1973), Granat and Söderlund (1979), Larson et al. (1975), Wiebe and Whelpdale (1977) and Chan et al. (1981) found that the removal of sulfur by rain from power plant and smelter plumes is a relatively inefficient process, only a few percent of the emissions being removed within about 15 to 50 km of the source even during precipitation itself. If the results were averaged over both wet and dry periods, the fraction deposited would be about an order of magnitude less. On the other hand, the results of Summers and Hitchon (1973) and Enger and Högström (1979), indicate much greater local deposition rates during a precipitation event. The results of the last two papers might be explained on the grounds that the summertime convective storms in Alberta studied by Summers and Hitchon are very efficient scrubbers for local pollution. Some of the air masses involved in Enger and