both potentially important factors that might work to increase otherwise small deposition velocities. Moreover, there is evidence that suggests that acidic particles, especially sulfates, might be carried by larger particles, sometimes graphitic in nature (q.v., the laboratory studies of Cofer et al., 1981). The rates of deposition of such complicated particle structures are essentially unknown. However, it is known that the shape of particles can have a considerable influence upon their gravitational settling speed (Chamberlain, 1975).

It is not clear to what extent special considerations appropriate for acidic species, such as those mentioned above, contribute to the finding of unexpectedly high deposition velocities for atmospheric sulfate particles, as reported in some recent North American studies (Hicks and Wesely, 1980; Everett et al., 1979; Sievering, 1981). It is especially intriguing that European experience has failed to produce these high values, which have sometimes been reported to be as high as several cm/s. European work has been fairly uniform in producing deposition velocities closer to 0.1 cm/s, while North American experience has been in favor of larger values. It has been postulated that the difference is due to the predominance of aged aerosol in the North American situation, with much more sulfate material present on larger particles. In this scenerio, the net flux of sulfate material is seen to be dominated by the rapid transport of a few larger particles, which particles are not likely to be found in the nearer-source European situation. However, it should be emphasized that the small amount of evidence that is presently available provides no convincing basis for any arguments of this kind.

It is informative to consider the flux of any airborne quantity to the surface underneath in terms of an electrical analog, the so-called resistance model developed initially in studies of agrometeorology (e.g., see Fowler, 1978). In this model, we identify the flux of the atmospheric property in question with the flow of electrons in an electrical circuit, in which individual resistances can be associated with readily identifiable atmospheric and surface properties. While the electrical analogy has obvious shortcomings, it permits an easy visualization of many contributing processes and enables a comparison of their relative importance. Micrometeorological