

The title of this manuscript, "A comparison of plant aluminum concentrations during a forty year period: implications for acid deposition," overstates its content. The main value of the paper as it currently stands is the compilation of Al concentrations. Contemporary concentrations are compared to those measured 40 years ago; "during" is an exaggeration. "Implications for acid deposition" cannot be drawn from the data presented; the last three pages of discussion are summed up in the author's conclusion: "The degree to which acid deposition increased Al mobility ... is impossible to quantify."

The comparison of Al concentrations measured in the 40's with those measured by the author using a different method is not adequately justified in the discussion on p. 7. The author suggests that the modern method "detects lower levels of Al" than the older method, without giving a reason. (The sensitivity of the analysis should be given in the methods.) She calculates that even if the two methods are in error by 25%, the modern concentrations are higher. No reason is given for the 25% rule. Why should we feel confident that the methods don't differ by a factor of two, as suggested by Figure 1? There is a good relationship between Al concentrations measured by the two methods, with only four points not falling on a line through the origin. Is there some reason why each plant should have exactly doubled its Al concentration? Would soil acidification predict that Al availability should be elevated by a constant difference (seems plausible to me) or by a constant multiplied factor, as shown here?

Clearly, the paper depends on the assumption that the two methods of Al analysis are comparable. The most convincing way to validate this assumption would be to apply the two methods to a single set of vegetation samples. If there are other grounds for believing the methods to be comparable, they must be better laid out. Which forms of Al are assessed by each of the methods? If Al speciation is a factor, were there changes in the soil with time that would affect speciation? Did Scott characterize the soils in 1948?

From the description of methods it seems possible that Maynard's samples of tree foliage were taken from the tree, while Scott's were taken from litter. Thus we may have learned simply that 50% of foliar Al is retranslocated during senescence. Even if both studies used fallen leaves, we have no information about the length of time before collection and the possibility of leaching by rain. More detail is needed in the methods in general.

The concentrations of Al in plants might prove interesting after more analysis. Table 2 is hard to read. I suggest one species per line with a column for each site to make it easier to compare sites. The 1948 data could be represented as a ratio, or the concentration data could be given along with the ratio. Since the discussion is all in terms of per cent increases, the current table, which shows only concentration, is far removed from the conclusions. Some estimate of error should be included, whether of the within-year variation or the between-year variation. The methods should state how samples were replicated. No use is made of the replication of measurements over three years.

Little use was made of site differences and none of the relation between soil analysis and Al concentration or change in Al concentration. On p. 6 the Al increases are compared across sites without any reference to the nature of the comparison. Were the differences significant? What statistical test was used? A table showing the analysis of variance or the statistical model with solutions or a graph showing increases by forest type or soil type would be a good illustration. Without such an illustration, I felt unable to evaluate either the importance of the differences or the possible causes. Figure 1 suggests that increases can be predicted from concentrations except for 4 outliers. Identification of the outliers might be illuminating. Except for these outliers, it is hard to imagine from the Figure that there is room for site differences in the very predictable increases.

Error estimates should be given in Table 1 to indicate whether there were significant differences in soil analysis. The four sites and three soils should be related in the tables. If differences are significant (site 1 changed more than 2 and 4), the points on Figure 1 could be coded by site or soil.

The discussion of the possible contributions of natural soil formation and acid rain to increased Al availability is unresolved and, as it stands, doesn't seem worth including. It could be better written, but without either new evidence or a new analysis, it will still not reach any valuable conclusions. If there is no way of estimating the contribution of acid rain to Al mobilization from this study, the whole question should be removed from the paper. The conclusion that Al mobilization from whatever cause was not severe enough to cause symptoms of Al toxicity or changes in species composition is valid and possibly worthy of more attention.

If the paper is to be resubmitted, the author should improve the writing. First, the requirements of the Publications Handbook and Style Manual should be followed. "Aluminum" should be used for the first occurrence and at the beginning of sentences; otherwise use "Al." Latin names must be given with common names of plants. The title must not exceed 12 words. Commas separate authors in the references. Abbreviate et alia as "et al." with a period. Use "to," not a dash, in "3-4 year old" and "1986-88." Inches are not acceptable units for horizon depths. The sentence "Implications for ... were discussed" is generically prohibited from abstracts.

Problems of grammar, organization, and style are harder to learn to recognize; colleagues and professional editors are possible resources. I have made some notations on the manuscript but these are not at all exhaustive.

To summarize, there may be value in the presentation of Al concentrations in plants, but the contribution is a very modest one. The comparison with the 1948 study must be justified by a better evaluation of methods. The role of acid deposition was not illuminated by this study. If the anthropogenic component cannot be distinguished by the addition of some more sophisticated calculation or comparison, the discussion of it should be dropped.