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Reply to Comments on "Chemistry of monsoon rainwater at Delhi".

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The chemical data for Delhi rainwater given by Sequeira and Kelkar (1978) and referred to by Sequeira in his comments, are for one station (location not specified) and for water samples, collected *continuously* and *cumulatively* for one month. Our data are for individual showers with *time* and *space* variation and are based on *immediate* analysis after collection. Hence the two sets of data should not be compared. Some of our values for various ions are generally high, perhaps due to the very large amount of particulate matter (19.6×10^{10} μg for 3 monsoon months, Padmanabhamurthy and Gupta, 1977) in Delhi air, which is washed by monsoon rain with the resultant particle–rainwater interaction.

Sequeira attempts to compare data for Bombay rain with that for Delhi rain. For obvious reasons, and as mentioned by him, this is incorrect. Bombay is a coastal city while Delhi is 1500 km inland on the edge of a desert with dust storms for nearly six months in a year. Further, rainwater chemistry depends on dispersal mechanisms which are different for the two cities. Sequeira refers to data from various coastal and inland regions in India (Sequeira and Kelkar, 1978) which differ markedly from that of Handa (1969) for Calcutta (similar to Bombay) and a number of inland stations. Handa (1969) reports high HCO_3^- values (similar to our data for Delhi) for most of the analyses; hence Sequeira's interpretation, based on partial analyses, is not correct.

The ionic imbalance calculated for our data by Sequeira, however, cannot be satisfactorily explained at present. Sequeira (1976) also reports such imbalances for Bombay rain, but they are however lower (±5–10%). In our data, total bicarbonate and total sulphate together account for 55% to 95% of total analyses, but significant amount of these ions are likely to be in complexes (NH_4, Ca and Na, complexes for SO_4^{2-} and Ca complexes for HCO_3^-). Several authors including Sequeira (1976), have speculated about such complexes for rainwater. Hence, in balancing cations and anions, not all HCO_3^- and SO_4^{2-} should be taken as free ions. This may be the cause for excess anions in many of our analyses. The extent of complexing, however, cannot be specified at this stage. Further, both cations and anions which were not included in our analyses, may somewhat neutralize the imbalance.

Our arguments do not rule out analytical problems speculated by Sequeira, even though we analyse our samples according to and along with EPA water standards. Differences such as that between data of Handa (1969) and of Sequeira and Kelkar (1978) for several coastal and inland stations and between our data and data of Sequeira and Kelkar (1978) for Delhi can only be resolved when inter-laboratory calibration is done.

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