

**Comments on "Atmospheric Turbidity over the United States, 1961-1966"
(Inference of No Rain Cleansing from Turbidity Data)**

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The interpretation of Flowers *et al.* (1969) of their turbidity data in relation to the rain cleansing of air requires comment. The data in question are those of their Fig. 8 giving average daily turbidity at Huron, S. D., for 1 June to 16 July 1966. And the interpretation is summed up in the statement: "Fig. 8 also indicates the inability of rainfall to clean the air appreciably." The particulars cited indicate that whereas rain occurrences at a station seldom show an effect upon the 24-hr mean of sunphotometer readings taken through a cloud-free atmosphere at the same station, the changes of air mass at the station do show a marked effect upon these means. It appears to me that the data presented do not contain the necessary information to support the quoted statement.

As their best example, in support of that statement, the authors cite the rain of 12 July. On this occasion, ". . . the turbidity observation was made about 10 hr after the end of the heavy rain. . . ."

The source of the 1.1 inch or so rainfall of 12 July 1966 at Huron was a thunderstorm typical of the area and season. Such a storm may be as large as 20-30 mi in diameter and may last up to an hour or so. The circulation of such storms has been studied, and models have been proposed (e.g., Browning, 1964; Newton, 1967). A generalized model of the scavenging behavior

of such storms has been outlined (Dingle, 1966; Dingle and Gatz, 1966). It is extremely unlikely that any of the rain-cleansed air was anywhere near Huron 10 hr after the end of the heavy rain, and therefore equally unlikely that the measurement of turbidity that was made bore any relation to the rain cleansing that was certainly done.

The effect of air mass change, on the other hand, is one that can be observed in 24-hr means of clear sky turbidity measurements. Because the time and space scales of the rain-producing events are very small compared to those of the data, the interpretation quoted above is not and cannot be supported by the data.

REFERENCES

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