Comments on "What Is the Role of Ice in Summer Rain-showers?"

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The findings presented by Braham (1964) are indeed interesting and valuable; however, their bearing on the question of rain stimulation is left rather obscure by omission of the part played by the clouds that were the subject of this study in the over-all production of summer-time precipitation in the area. The Whitetop Project is one of two cited by the recent report of the Panel on Weather Modification of the National Academy of Science (1964) as having "led to extremely pessimistic conclusions" regarding rain stimulation on the grounds that "the coalescence process dominates precipitation so heavily in the regions studied that forced freezing of supercooled water by seeding cannot increase rainfall, but might in fact, decrease it."

While such an inference would seem to be intended by the concluding paragraphs of Braham's article, this correspondent is led to ask what proportion of the total summer rainfall is produced by the clouds—typical of

those described in the article—of nine minutes average duration. What proportion of the total summer rainfall was contributed by the 80 per cent of clouds in which the radar echoes grew less than 5,000 ft?

If, as seems likely, the four per cent of clouds in which the radar echoes grew 10,000 ft or more contributed a disproportionately large share of the total rainfall, the role of ice in these clouds and their susceptibility to seeding may have an importance for the over-all effectiveness of rain stimulation far outweighing that of the many smaller clouds. The indirect evidence from hail of the presence of large quantities of supercooled water in large shower clouds, the relatively high vertical velocity of air passing through the cloud base and consequent large droplet concentration, and the rapid transport of air to regions of low temperature, all attest to the existence of conditions in these clouds quite different from those described by Braham. These conditions in large clouds are also those where triggering by seeding of the release of latent heat of freezing may be effective (Malkus and Simpson, 1964).

REFERENCES

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