APPENDIX.

PLANNING AN EXPERIMENT WITH CLOUD SEEDING

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A1. Introduction

The general principles of the theory of experimentation were established by R. A. Fisher in his memorable book *The Design of Experiments* [1], and then developed by Fisher's innumerable followers and coworkers of whom we shall particularly mention Frank Yates [2]. Primarily, the designs studied by these scholars refer to experimentation in biology and, more particularly, in agriculture. Naturally, each domain of experimentation presents certain particularities and, while the general principles of experimental design remain the same for all domains, each particular domain imposes its own limitations and requires special designs. In particular, experimentation with clouds or storms involves specific difficulties not encountered, for example, in the experiment with the Lady Tasting Tea, the famous problem used by Fisher to illustrate his ideas.

Each of the experiments reported in these *Proceedings* involved a substantial amount of planning and the experience gained will be most useful in designing future experiments. The purpose of the present appendix is to contribute to this goal by reviewing the problem as a whole and by focusing attention on several subproblems which appear to us of particular importance. This should be done with reference to as many already completed experiments as possible. Unfortunately, our familiarity with quite a few of these experiments is of a very recent date and some of the very important problems raised by them, including the problem of possible after effects of seeding noticed in Australia, must be left out of consideration.

Numerical illustrations given below are based, predominantly, on data collected by project SCUD [3]. Here, the achievements of the planners, a meteorological group headed by Dr. Jerome Spar cooperating with a statistical group headed by Dr. John W. Tukey, seem to have received less attention than they deserve.