swers. All too often there has been an overreliance on a single statistical outcome to declare success or failure, in lieu of adequate comprehensive scientific interpretations.

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The title of Richard A. Kerr's article "Cloud seeding: One success in 35 years" (Research News, 6 Aug., p. 519) would have better reflected the state of the subject if it had ended with a question mark. It has yet to be proved that even one cloud seeding experiment has produced significant modification to precipitation on the ground (although there is no doubt that cloud seeding can modify cloud structures).

Caution, and still more caution, is the keyword in evaluating the effects of cloud seeding, even in the case of the Israeli experiments, which appear to have provided firm evidence for a positive effect. These experiments were, in large part, designed, executed, and analyzed by the same team. Independent validation and replication is required before the results of those experiments can be considered as proof.

It is possible that some cloud seeding experiments have modified precipitation at the ground to degrees that were not detectable statistically within the time periods of the experiments. Improved understanding of the physical events involved in the formation of precipitation in both natural and artifically seeded clouds, and, most important, of the means for documenting these events, can reduce the times required to obtain statistically significant results.

Cloud seeding to modify precipitation is a challenging task, perhaps one of the most difficult to be tackled in this century. Many of the problems encountered will be faced in other attempts to determine whether it is possible to control large-scale geophysical events (for example, earthquakes). After some 35 years of research efforts, we now have the tools to determine whether or not we can control precipitation. It would indeed be a tragedy if work on this subject were brought to a halt.

Finally, I would like to point out that the reanalysis of the Climax data, which Kerr attributes to me, was in fact, carried out by Arthur L. Rangno, a member of my research team.

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Extraterrestrial Intelligence: An International Petition

The human species is now able to communicate with other civilizations in space, if such exist. Using current radioastronomical technology, it is possible for us to receive signals from civilizations no more advanced than we are over a distance of at least many thousands of light years. The cost of a systematic international research effort, using existing radio telescopes, is as low as a few million dollars per year for one or two decades. The program would be more than a million times more thorough than all previous searches, by all nations, put together. The results—whether positive or negative—would have profound implications for our view of our universe and ourselves.

We believe such a coordinated search program is well justified on its scientific merits. It will also have important subsidiary benefits for radioastronomy in general. It is a scientific activity that seems likely to garner substantial public support. In addition, because of the growing problem of radiofrequency interference by civilian and military transmitters, the search program will become more difficult the longer we wait. This is the time to begin.

It has been suggested that the apparent absence of a major reworking of the Galaxy by very advanced beings, or the apparent absence of extraterrestrial colonists in the solar system, demonstrates that there are no extraterrestrial intelligent beings anywhere. At the very least, this argument depends on a major extrapolation from the circumstances on Earth, here and now. The radio search, on the other hand, assumes nothing about other civilizations that has not transpired in ours.

The undersigned* are scientists from a variety of disciplines and nations who have considered the problem of extraterrestrial intelligence—some of us for more than 20 years. We represent a wide variety of opinion on the abundance of extraterrestrials, on the ease of establishing contact, and on the validity of arguments of the sort summarized in the first sentence of the previous paragraph. But we are unanimous in our conviction that the only significant test of the existence of extraterrestrial intelligence is an experimental one. No a priori arguments on this subject can be compelling or should be used as a substitute for an observational program. We urge the organization of a coordinated, worldwide, and systematic search for extraterrestrial intelligence.

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