

Charney— A Remarkable Colleague*

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Jule Charney had an uncanny knack for recognizing good scientific work and potential. Long before coming to MIT he had formed the practice of inviting established or promising scientists to visit him and work with him, sometimes for a year or longer. To the younger ones he often became a principal mentor; to the more senior ones he became a colleague.

To these scientists, having Jule as a colleague frequently meant, among other things, collaborative work resulting in joint publications. A glance at Charney's list of papers will reveal the multitude and caliber of his coauthors.

It was the "other things" that made such an influential and unforgettable colleague from my own point of view. We never published a joint paper, nor did we even collaborate directly on any work that led to a publication by either of us. We did, however, engage in frequent and at times almost daily scientific discussions. Most often these would take place in Jule's office, where, chalk in hand, we would scribble equations on the blackboard and argue the pros and cons of various hypotheses and methodologies. Discussions of this sort sometimes lead to nothing, but in this case, with Jule's insight, they were often highly productive. Many people have been inspired by Charney's ideas, whether these have involved hurricanes, desertification, or some other topic, but I was in the fortunate position of watching some of these ideas being born.

A welcome by-product of Jule's presence at MIT was my contact with the many visitors whom he invited here. Some of these contacts have lasted to this day.

Perhaps even more unforgettable than any scientific discussions were some of Jule's colorful conversations, most often when a small group was gathered. Sometimes these also occurred in his office, but at other times they would take place over a lunch table at the Faculty Club, or in a car en route to Woods Hole to attend a seminar in a series that Charney was instrumental in organizing. They would cover a wide range of topics and, if they involved science, would do so only incidentally. Charney did not simply know meteorology and oceanography; he knew the world. His tendency to digress and talk about the world, which sometimes frustrated some of his listeners at formal seminars, only served to enrich his everyday talk.

* Revision of a contribution to the Charney memorial symposium at MIT, March 1983.

It was on one of these occasions that Jule recalled how, back in the days when computers were novelties and numerical weather prediction was just taking hold, he was invited to appear on the "Today" show, then hosted by Dave Garroway, to tell the world how computers were going to forecast the weather. One of the important aspects of this program, from Jule's point of view, was that it took place at 7 a.m. Jule was not noted for getting up at this hour, and was in fact more likely to sleep until noon, but he would often make up for this by working in his office until three the next morning. Not surprisingly, then, he had never watched the "Today" show.

He told us that he felt that he ought to see the show at least once before agreeing to appear on it, and so, one morning, he managed to pull himself out of bed and turn on the TV set, and the first person he saw was a chimpanzee. He decided that he could never compete with a chimpanzee for the public's favor, and so he gracefully declined to appear, much to the dismay of the computer company that had engineered the invitation in the first place.

On another occasion when our conversations had turned closer to scientific matters, Jule was again talking about the early days of numerical weather prediction. For a proper perspective we should recall that at the time when Charney was a student, pressure was king. The centers of weather activity were acknowledged to be the highs and lows. A good prognostic chart was one that had the isobars in the right locations. Naturally, then, the thing that was responsible for changes in the weather was the thing that made the pressure change. This was readily shown to be the divergence of the wind field. The divergence could not be very accurately measured, and a corollary deduced by some meteorologists, including some of Charney's advisors, was that the dynamic equations could not be used to forecast the weather.

Such reasoning simply did not make sense to Jule. The idea that the wind field might serve instead of the pressure field as a basis for dynamical forecasting, proposed by Rossby, gave Jule a route to follow. He told us, however, that what really inspired him to develop the equations that later became the basis for numerical weather prediction was a determination to prove, to those who had assured him that the task was impossible, that they were wrong.

As his scientific accomplishments accumulated, he turned his attention to organizational problems that needed to be solved before the scientific knowledge could be put to optimum use. Perhaps best known is his role in initiating GARP, the Global Atmospheric Research Program. The recognition by his colleagues of the part that he was playing was nowhere more evident than at a GARP planning conference in 1967 at Skepparholmen, near Stockholm. At this time portions of GARP went by other names, such as the World Weather Watch. Part of the daily routine at Skepparholmen was a big breakfast, a big lunch, and a big but early dinner, so that, as evening progressed, more food would appear. While most of us were sitting around one evening and overeating, Charney could be seen madly dashing from one table to another, checking up on how the plans were progressing. I think it was Vincent Lally who remarked, after Charney had left our table, "Can you picture a World Weather Watch with seventeen Jule's?"

The idea is a bit overwhelming, when we recall what was accomplished with just one. But, in a certain very real sense, even if the World Weather Watch did not have seventeen Jules, meteorology did. There was the one in flesh and blood, and then there were the things that were distinctly Charney's own creations—new fields of investigation, such as geostrophic turbulence and the drought-albedo problem, and new operational programs. Each of these bears Jule's mark, and in its own way deserves to be called a Jule. With the degree of approximation that we customarily use in dynamic meteorology, the total number comes to seventeen. And I like to think that although the first one has moved on, the other sixteen are still here and will continue to guide our efforts for many years to come.