

"authorities" are all detrimental to science. If science is to remain vibrant and productive, its practitioners must be more proactive in explaining science in a way the public can understand, relate to, and support. This effort must be made at every possible occasion by scientists and media personnel alike, all who value the product of science—knowledge.

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Insider notes on the International Geophysical Year

Fae Korsmo's article (PHYSICS TODAY, July 2007, page 38) on the genesis of the International Geophysical Year does a good job of covering the international scientific relationships that gave birth to the idea. But there were two other achievements without which the IGY would not have attracted the favorable public support or the congressional appropriations, both of which were essential to the fame and success of the IGY and would lead to the Antarctic Treaty. I learned about them through long-ago personal conversations with Walter Sullivan and Joseph Kaplan, who were instrumental in IGY preparations.

Fae does reference Walter's fine book on the IGY. But how did he go from being the *New York Times* political correspondent in Austria to becoming the paper's—and maybe the country's—best science writer, with a deep commitment to the IGY? He had no background in science beyond a keen interest in how violins are made. Walter told me that when he asked the *Times* to bring him home so his kids could go to US schools, his employer said, "No. You are too important to us where you are." Then one day he saw a notice that the newspaper was looking for a science writer to cover the story of the IGY. None of the other writers on staff seemed interested in going to the ice. But Walter saw his best chance to get his family back home, so he volunteered to go to Antarctica and try being a science writer. He stayed with the story, broadened his great skills into all areas of science, and brought Antarctic science and the IGY to the front page of the *New York Times*.

But what about the money to support US scientists in their Antarctic work? The National Academy of Sciences' IGY history reminds us of Joe's role (not mentioned in the PHYSICS

TODAY piece): "American participation in the IGY was charged to a US National Committee (USNC) appointed in March 1953 by the NAS. Joseph Kaplan, Professor of Physics at UCLA, was appointed Chairman of the USNC."¹ When NSF went to Congress to get the needed appropriation, it faced considerable skepticism. The duty fell on Joe to invite the key congressman to lunch. Joe told me that no amount of passionate argument about the merits of Antarctic science was persuasive. Finally, he decided he had to find a subject his lunch partner was interested in. The congressman's favorite subject turned out to be college football. Joe jumped at the opportunity. "Did you know that I am chairman of the UCLA faculty committee on athletics?" he asked. After a half hour of college football stories, the congressman said, "Joe, you sound like a regular fellow. What is this project you need money for?" His support for the IGY appropriation turned the tide, and the IGY was off and running.

Reference

1. National Academies webpage, "The International Geophysical Year," <http://www7.nationalacademies.org/archives/igyhistory.html>.

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Wigner and the 'gift' of mathematics

I recently read Frank Wilczek's Reference Frame in the May 2007 issue of PHYSICS TODAY (page 8), in which he discusses his reaction to Eugene Wigner's claim that the success of mathematics in the natural sciences is miraculous. Wilczek's discussion seems to assume Wigner's claim is that mathematics has worked miracles in bringing about the development of the natural science disciplines. I, however, have taken that statement to express wonder that every nook and cranny of human thought seems to find some branch of mathematics just waiting to describe it or ready to be developed to describe it. That is, there seems to be a mathematical description available for everything. Even Darwin's theory can be described mathematically, and often is.

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Wilczek replies: Interested readers deserve the pleasure of reading Wigner's classic essay for themselves. Here's how he began it: "The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve." I don't think I misrepresented him.

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Clarification on chaos and complexity

In his review of my book *Chaos and Complexity in Astrophysics* (PHYSICS TODAY, September 2007, page 71), Mario Livio correctly points out that "chaos theory actually has had a limited impact on most areas of astrophysical research." That was indeed the main reason for my writing the book.

Many astrophysical systems are genuinely very complicated, as Livio says, but nowhere in the book did I "pretend that those systems are governed by a simple, underlying mechanism described by a limited set of nonlinear equations." Likewise, I did not complain about "astrophysicists resorting too quickly to . . . computer simulations." I merely wished to stress that numerical simulations *alone* cannot be the key to physical understanding and that modern approaches of nonlinear dynamics and pattern theory may be very useful, at least as complementary tools, in the pursuit of that understanding.

It seems to me that atmospheric and oceanic geophysicists—and even research engineers in various fields—have been rather successful in using such combined approaches, even though the systems they have been dealing with are also very complicated.

I think these points should be made, to set the record straight.

I decided not to include any detailed discussion of convection theory in the book, save the Lorentz and Moore-Spiegel models that were among the early paradigms of deterministic chaos. Turbulence in general and convection in particular are vast and complex subjects, and many books have been devoted to their various aspects. I apologize again, as I did in the book, for not including many important contributions and thus disappointing some readers.

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