

The Star-Ledger

He warned of warming long before it was cool

Sunday, February 04, 2007

BY KITTA MacPHERSON
Star-Ledger Staff

Long before global warming was a household phrase, at a time when climate research was in its infancy, a young scientist in an out-of-the-way lab in Princeton changed the world by asking a computer a few surprising questions.

What would happen, Syukuro Manabe wanted to know, if the amount of carbon dioxide in the Earth's atmosphere doubled?

He plugged the numbers into his computer and then sat back and waited.

As the computer program crunched physics formulas it began to spit out numbers that painted a startling view of a vastly different Earth. An Earth shrouded with CO₂, a world whose average temperatures climbed about 4.5 degrees Fahrenheit, where polar ice caps melted to slush and tides swelled.

That was in 1965.

On Friday, the rest of the world finally caught up with the Princeton University geophysicist.

When the United Nations issued its long-awaited, authoritative report on global warming the other day, Manabe couldn't help but feel vindicated. The report's findings were eerily similar to his own 42-year-old discoveries.

It's okay, said the trim 75-year-old who is called "Suki" by his colleagues and enjoys jogging daily through Princeton.

"I never intended for it to be a big deal. I just happened to hit the jackpot the first time," he said, sitting on the edge of a comfy chair last week in his spacious Princeton townhome.

Sheer brilliance played as large a role as luck, according to others.

"He is the pioneer -- period -- on planet Earth that raised the question of global warming," said climate scientist Jerry Mahlman, a longtime colleague. "Suki was the first one to get the fundamental essence of global warming right."

Anthony Broccoli, a climate model expert and Rutgers University professor, also had praise for Manabe's work.

"I would say that no one can be as successful as Suki without being very, very smart. And it's a combination of vision, intelligence and energy that really makes him special."

Early on, however, lots of physicists weren't quite as effusive.

"They said, 'You dummy, your model is way too simple,'" Manabe said.

Simplicity, he argued, requires much thought. He believed his results and thought they were meaningful. He just didn't know why.

A NATURAL

Fighting for his point of view was nothing new. Manabe was born in 1931 into a family of doctors on the island of Shikoku, the smallest of Japan's four main islands. It was a place so remote that even American bombers bypassed the region during World War II.

Manabe's father wanted him to be a physician. But he couldn't imagine such a career. "I thought of blood gushing, of having to make snap judgments. I wanted to think at my own pace," he said.

Interested in physics, he wanted to work with something he could see, like the weather. Manabe attended the University of Tokyo where he earned his undergraduate and doctoral degrees in geophysics. But his father never really understood what it was his son did.

"To him, physics was all the same," he said. "I think he thought I was stargazing or something."

There was little work for scientists in post-war Japan, so his mentor sent him to Washington, D.C., in 1958, to work for the renowned scientist Joseph Smagorinsky.

Regarded by many as a visionary, Smagorinsky had been charged by federal science leaders with forming a special research unit that would apply the newfound power of computers to climate science. Shortly after Manabe's early experiments, Smagorinsky moved the federally funded unit to a quiet, lush corner of the Forrestal Campus of Princeton University, where it became known as the Geophysical Fluid Dynamics Laboratory.

In such an environment, Manabe said, his mind came alive. Good ideas come only when he has quiet, and he's not rushed and under pressure. "I guess I was born to be a research scientist," he said.

BREAKTHROUGHS

The first paper detailing Manabe's early experiment, published in the *Journal of the Atmospheric Sciences* with colleague Richard Wetherald in 1967, is one of the most highly cited scientific papers in history. The Institute for Scientific Information lists it as a "citation classic."

"Probably, this is the best paper I wrote in my whole career," Manabe said.

Wetherald remembers the process well. "He didn't really care how long a job took; the important thing to him was to do it right," he said.

Many pioneering works followed.

In 1975, Manabe and Wetherald teamed up again, publishing the first study that used a weather model operating in three dimensions to study the potential effects of greenhouse warming. In doing so, they found that an increase in water vapor and a lessening of sea ice cover would occur, further increasing temperatures.

The paper, along with a parallel discovery by others that atmospheric concentrations of carbon dioxide were increasing, was viewed as a turning point in climate studies. It "caused greenhouse warming research to make the transition from science fiction to science," Wetherald said.

Other breakthroughs and successful collaborations with other leading scientists followed. Manabe and Kirk Bryan developed a model that simulated the behavior of the atmosphere and the oceans. The study would form the basis of advanced models used for analysis by subsequent teams of scientists for the United Nations, including the present study.

As global warming moved to the forefront of environmental issues, Manabe stepped back into the shadows. He served several times as a witness at government hearings but didn't enjoy the limelight.

"My throat gets dry, my heart starts pumping," he said. And people like James Hansen, the NASA scientist, are so passionate and articulate, he said.

"Each scientist has to decide on his own to what degree he wants to advocate a position," he said. "For me, I decided to stay with science quietly."

PERSISTENCE

Fifty years at climate research has not diminished Manabe's passion for the subject. He jumps out of

his chair and waves his arms when he uses the term "hydrodynamic flow." For "solar radiation," he stretches his arms to the ceiling and makes a listener almost feel the warmth of rain falling down.

Manabe's wife of 45 years, Nobuko, believes the key to his happiness is a willingness to toy with a notion.

"Some people have ideas right in front of them and they let them slip away," she said. "He seizes them and then likes to think and think ... very deeply."

She rolls her eyes upward and laughs. He chuckles, too.

Manabe has stayed busy, despite retiring from the climate lab in 1997. For a while, he headed a global warming research program at an institute in Yokohama, Japan. But he returned to Princeton in 2001, where he maintains his post as a visiting research collaborator at the university. From his campus office, he is writing a book on the physics of global warming.

He slowed down a bit last year, he said, after several bouts of surgery to treat diverticulitis.

His colleagues, however, see him as unstoppable.

"He just wants to understand everything," said Broccoli of Rutgers, his longtime colleague. "I'm sure he's just as curious now as he's always been about what will happen in the future."

Kitta MacPherson may be reached at kmacpherson@starledger.com or (973) 392-5836.

© 2007 The Star Ledger

© 2007 NJ.com All Rights Reserved.