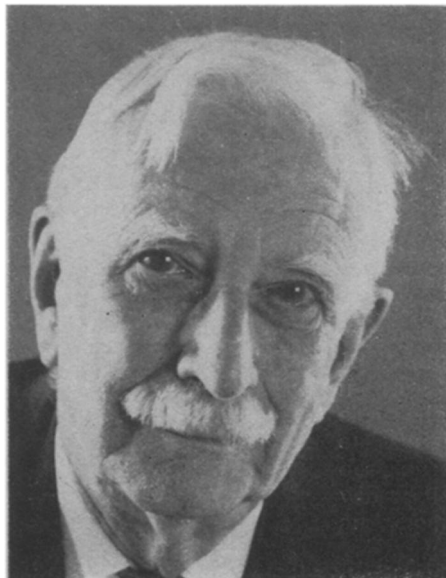


Abbot: Cycles and Sub-Cycles

by Frank Sartwell



SMITHSONIAN
Dr. Charles G. Abbot

At 9:30 each Monday morning, a persistent astrophysicist gets out of a Washington taxi and enters a crenelated red-rock castle near the Capitol. Dr. Charles G. Abbot, "retired" for 22 years, is still at work—although his major work has never been accepted by most of his peers and he suspects that it may soon become invalidated by the world's turmoil.

Dr. Abbot is a former director of the Smithsonian Institution's Astrophysical Laboratory, and former head of the Smithsonian itself, a position designated "Secretary." This title Dr. Abbot feels more suited to "a young lady of pulchritude taking notes."

At 94, Dr. Abbot is hardly young. His pulchritude, if it can be called that, consists of snow white hair, moustache and eyebrows set into a craggy, kindly face. But he certainly takes notes.

Although in his 72 professional years he has invented, designed and redesigned many astronomical instruments, his major work has been with pen and paper: erecting a scaffolding of statistics on which to build a system of long-term weather forecasting based on solar cycles. Just one of his multitudinous scrolls, when unwrapped from around a Mother's Oats box, stretches 20 feet across his living room floor—and bears at least 28,000 hand-written entries. It holds the weather history of St. Louis for 104 years, 1854-1957. Along the chart zig-zags a red line and a blue line, one marking what the weather should have been under Dr.

Abbot's theories, and one marking what it actually was.

In many places the two lines march closely together, up and down. "A very nice piece of agreement here," smiles Dr. Abbot, "and look here!"

The Lines March

In other spots, the lines appear never to have been introduced. They ignore each other. Dr. Abbot points to these periods as times the atmosphere was suddenly excessively polluted—the eruption of Krakatao in 1883 that spread dust around the world, the periods of heavy atomic bomb testing.

That's why he fears that his system, based on meteorological records, might become useless. In a paper to be printed in the Proceedings of the National Academy of Sciences this month, Dr. Abbot sadly concludes, "The present proposals to 'improve' weather may alter atmospheric circulation so much that world weather records of the past may become useless for forecasts. There is also the danger that France, China, India, Indonesia and other countries may explode bombs. Thus my method of prediction for generations to come may go into the discard."

If it does, it will have few mourners among professional weathermen. "Since the death of H. H. Clayton," Dr. Abbot has written, "I know of no professional meteorologists in the world, with the exception of Dr. Irving P. Krick, who support my main conclusion. They all, indeed, credit me with highly accurate solar measurements, but in the absence of a connecting theory, they mistrust any proofs that solar variation has any considerable influence on ground weather."

Dr. Helmut E. Landsberg, director of the Weather Bureau's Environmental Data Service, agrees with Dr. Abbot that the sun influences the weather, but says he cannot find the repeating cycle or sub-cycles Dr. Abbot sees. Further, he and his colleagues declare themselves unable to prove that atomic explosions change weather patterns.

Followers

The late Clayton and the credulous Krick, however, are not the total of Dr. Abbot's followers. Farmers, oil men, bathing suit manufacturers and prospective brides are eager for his counsel. Relying on Dr. Abbot's pre-

diction of a wet summer, one Iowa farmer planted more corn than he had deemed wise before. He did so well that he sent the scientist a \$100 check, which found its way to Dr. Abbot's church when the astrophysicist refused it.

In one period, Dr. Abbot recalls fondly, he was consulted by 14 young ladies who wanted to be sure of sunny skies for their weddings. Dr. Abbot predicted good weather for 13 of them but said he was doubtful about the 14th. The 13 had clear skies; the last didn't get rain—but she was married on a cloudy day.

The heart of Dr. Abbot's theories is the idea that "the sun isn't a perfectly constant star. It varies in a period of 273 months." This period, a double sunspot cycle, repeats itself—and so does the weather at any given place, allowing for certain other factors such as air pollution. Further, within the 273-month period there are sub-cycles, "harmonics" of the basic cycle, expressed as fractions of the whole: 273/3, 273/24, 273/63, for example.

Will it rain much next month in Nashville, Tenn.? Chances are the weather will be similar to that the city had when it was last in this particular place in the cycles and sub-cycles, allowing for increasingly dirty air, which blocks out some of the sun's radiation, says Dr. Abbot. He claims from 50 to 70 percent accuracy for his predictions, which is a good average in weather forecasting.

Science by Happenstance

For a man whose whole professional life has been wrapped up with solar studies (he has traveled the world to observe seven eclipses), Dr. Abbot began with no fascination with the sun at all. As a boy in Wilton, N.H., "I never much cared about the sun. In fact, I was interested in things mechanical, and I always hoped it would rain so I could stay inside rather than having to go out and plant corn."

Dr. Abbot entered science, to hear him tell it, by happenstance. "Some friends were going to the Massachusetts Institute of Technology to take entrance exams. I thought it was a good time to see the place, so I went along. But then I was afraid I'd get lost, so I went in and took the exam too." He was graduated in 1894, took a master's degree in 1895, and joined the Smithsonian.