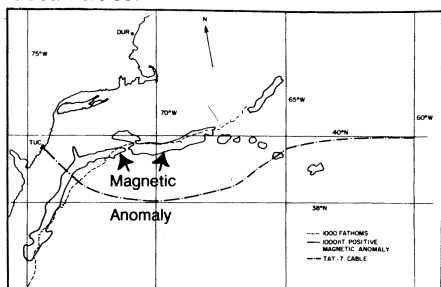


## Catching currents with a cable

Whenever a geomagnetic storm stirs up the ionosphere, electrical currents surge throughout the earth. These currents provide scientists with a means of learning about the conductivity of various regions of the planet.

Most of the conductivity studies done with conventional techniques have been limited to small areas in the Pacific Ocean. In the last few years, however, researchers at AT&T Bell Laboratories in Murray Hill, N.J., have taken advantage of a telecommunications cable laid across the Atlantic Ocean for measuring, in another way, both earth and ocean electrical currents on very large scales.

Last year, Louis Lanzerotti, David Thomson and their co-workers reported on studies using a section of the TAT-7 cable, which stretches from Tuckerton, N.J., to Lands End, England, to search for currents leaking from the earth's core (SN:7/6/85,p.5). Now they've used the cable to explore the electrical structure of the eastern U.S. coast and to measure ocean tides.



Researchers using AT&T's TAT-7 cable think currents may be flowing in the earth along a region where magnetic field measurements are also very high.

In studying the continental margin of the East Coast, Lanzerotti's group monitored the voltage (from which current can be calculated) across 1,200 kilometers of the generally east-west-trending cable in February 1983. For six days the cable was not operated by AT&T and so could pick up currents from the natural environment. At the same time the group measured changes in the magnetic field at the Tuckerton end of the cable, and at another site along the coast. The researchers expected to find a strong correlation between the cable voltage and the north-south component of the magnetic field. Instead, they discovered that the cable voltage was most strongly correlated with the east-west magnetic field readings.

As reported in the June 10 JOURNAL OF GEOPHYSICAL RESEARCH, Lanzerotti's group decided that the most plausible explanation for the correlation is that the continental margin is underlain by an ex-

tensive north-south-trending current channeled in the crust and upper mantle. The researchers suspect that this current may be associated with what is known as the East Coast Magnetic Anomaly, a northwest-southeast-trending region that bears an unusually strong magnetic field.

Other scientists have suggested, among other things, that this anomaly may be caused by a buried fault or a body of highly magnetized rocks. "We don't think that the anomaly itself is making the current flow," says Lanzerotti. "But whatever exists in the earth that causes the magnetic anomaly may also be a region of enhanced conductivity."

In the June GEOPHYSICAL RESEARCH LET-

## China set to launch U.S.-made satellites

With the Western world's space programs reeling under a series of launch mishaps that have virtually shut down its means of access to orbit, an American firm has contracted to have a pair of U.S.-built communications satellites launched by China.

"Money has changed hands," says Henry Schwartz, head of Teresat Inc. in New York, for "launch reservations and a launch agreement" with a Chinese state enterprise called the China Great Wall Industry Corporation. Under the agreement, Chinese Long March 3 rockets — approximately equivalent to the U.S. Delta rocket — are scheduled to launch the first satellite in the last quarter of next year, followed by another in the first quarter of 1988.

An official of China Great Wall was quoted by UPI as saying, "China has no intention of competing with Western countries in this field. We contract to do this business in order to make up for the shortage of carrier rockets."

But according to Schwartz, "That's not the position. The position is that they're building a space industry around this."

In fact, Schwartz suggests, the Chinese seem to be a serious competitor. "I believe that they have the facility and the ability to do this," he says. "They certainly have a launch facility that's modern, and they have modern technology." They have launched 18 satellites of their own so far, he notes, "of which they've had only one failure—their record is very good." In addition, China is reported to be discussing launch possibilities with at least a dozen countries.

"China is trying to operate more in the capitalistic sense as we know it than in the normal business-as-usual [sense]," says Schwartz, "and the group that we dealt with in China, I believe, is the most advanced business and technology group in China today. . . . The bureaucratic chain of command is much shorter in the Ministry of Astronautics . . . than you would normally find in other indus-

TERS, the researchers also report on the use of a long segment of the undersea cable to measure the flow of electrically conductive seawater. In particular they detected ocean tides, which are caused by the gravitational tugs of the moon and sun. However, Lanzerotti says the strength and frequency of a few of the cable signals differ from what tidal models predict. "It's not yet clear if those differences are due to inadequacies of the models *per se* or if it's the way we are testing the model," he says.

The researchers think the cable will eventually provide a test for tidal models that is different from, and in some cases more rigorous than, the tidal gauge data used now. — S. Weisburd

trial areas in China."

The two U.S.-built satellites to be launched by China are planned to be the same pair that were carried aloft by the space shuttle in February 1984, but which were retrieved during a later shuttle mission because near-identical malfunctions of their built-in rocket motors left them in the wrong orbits (SN: 11/24/84,p.326). Teresat Inc. was formed in March 1985 to buy the satellites (Westar VI and Palapa B) from the insurance underwriters for refurbishment and relaunching.

"I understand," says Schwartz, "that [the U.S.-Chinese launch deal] is the first contract in history that's been signed with a technology float from China out instead of from the Western world in."

— J. Eberhart

## Chesley Bonestell: 1888-1986

Chesley Bonestell, long considered the dean of astronomical artists for his realistic portrayals of planetary and other space-related themes, died June 11 at his home in Carmel, Calif., at the age of 98. Having painted such topics since his teens, he later became particularly noted — and influential on a generation of younger space artists — when he illustrated the now-classic 1949 book, *The Conquest of Space*, a collaboration with rocket pioneer Wernher von Braun and writer Willie Ley. Besides illustrating several other books as well as articles for LIFE, LOOK and other magazines, his work appeared in a number of films such as "Destination Moon" and "When Worlds Collide" (to say nothing of non-space films including "The Hunchback of Notre Dame" and "Citizen Kane").

In March of this year, as the result of a contest conducted by the Planetary Society, an asteroid (number 3129) discovered in 1979 by then-Caltech astronomers Eleanor Helin and Schelte J. Bus was named Bonestell. □