GEODESY

The Superline: 500 Meters of Air

A team of scientists has finally succeeded in pinning down the length of a 500-meter row of huge concrete pillars, buried beneath the ground in Ohio—a seemingly easy task that took more than a year.

The pillars are the marking stones for the first geodetic standard base line in the United States, which will hopefully enable the super-accurate calibration of instruments used to measure objects as big as the entire country.

The Ohio State University scientists who built it hope that the line will be accurate to one part in 10 million, or the thickness of a newspaper page in 500 meters, but such infinitesimal computations are truly nerveracking. Almost anything can affect them. For example: the line slopes up less than one degree, yet every measurement made on it must be corrected for the difference in atmospheric pressure.

Beams of light sent by interferometers are the only way accurate enough to take advantage of the line's accuracy. There are only five other such lines in the world, the largest of which is also the oldest: an 832-yarder in Finland. Finland is practically the hub of geodesy, and most of Ohio State's geodetic faculty speaks Finnish.

Just picking the site for the line took three years. Since weather conditions are so critical, it is practically unusable except in late fall. This means that now that it has finally been measured, the frustrated scientists must wait almost another year to check their figures and see that the pillars have not moved even a fraction of an inch, or—and this is a horrible possibility—that they have. In that case, though they may not actually have to abandon the whole thing, the poor geodesists will be in for some more years of waiting and recalibrating.

The line's original 500-meter length was set using quartz bars equal to 1,650,763.73 wavelengths of Krypton-85, the most exact distance standard now in existance, adopted in 1960 by international convention.

Besides calibrating instruments, the line may be used to make a more accurate measurement of the speed of light than now exists. In its mapping role, it may continue to be used for measurements of the size and shape of the earth and even the moon.

Films of The Week

THE CHARACTER OF PHYSICAL LAW. Seven 16mm, b&w, sound films of the 1964 Messenger Lectures at Cornell University given by Richard Feynman of the California Institute of Technology. Titles are: 1. The Law of Gravitation, an example of Physical Law, 55 min. 2. The Relation of Mathematics to Physics. 57 min. 3. The Great Conservation Principles, 56 min. 4. Symmetry in Physical Law. 58 min. 5. The Distinction of Past and Future. 47 min. 6. Probability and Uncertainty—the Quantum Mechanical View of Nature. 59 min. 7. Seeking New Laws. 59 min. Audience: general student and adult. Rental and sale information from Film Librarian, Educational Services Incorporated, 39 Chapel St., Newton, Mass. 02160.

CINGULOTOMY FOR CHRONIC NEUROPSYCHIATRIC ILLNESS AND INTRACTABLE PAIN—K-1276. 16 mm, b&w TV film recording, sound, 9 min. Describes in detail the operative approach to cingulotomy, and concludes with statistical data and resume of operative results. Audience: professional biomedical personnel. Free short-term loan from Public Health Service Audiovisual Facility, Atlanta, Ga. 30333.

CLOUDS. 16mm, color and b&w, sound, 9½ min. Introduces primary grade pupil to a variety of observations that he himself can make about clouds, and explains how clouds are important to mankind. Audience: primary grades. Purchase color $120 or b&w $65 from Film Associates, 11559 Santa Monica Blvd., Los Angeles, Calif. 90025.

DRUGS AND THE NERVOUS SYSTEM. 16mm, color, sound, 16mm. Effects of drugs on organs and body systems are surveyed using aspirin as an illustration. Film then explains the serious disruptions caused by abuse or misuse of drugs such as airplane glue, stimulants, depressants, hallucinogens. Animated. Audience: junior and senior high school. Purchase $180 from Churchill Films, 662 N. Robertson Blvd., Los Angeles, Calif. 90069.

DYNAMIC CAREERS THROUGH AGRICULTURE. 16mm, color, sound, 28 min. Shows how new techniques have revolutionized the nation's largest industry—agriculture—and how this change has created thousands of new opportunities for American youth. Audience: high school and college students, general, farm audiences. Free loan from Farm Film Foundation, 1425 H St. N.W. Washington, D.C. 20005 (Produced by Charles Pfizer and Co., Inc.).

A SMALL MIRACLE. 16mm, color, sound, 18 min. Shows how Polariod Corporation handles film pack parts and finished film pack through case handling system for in-transit storage. Audience: indusrtial, general. Loan information from Link-Belt Company, Free Film Library, Prudential Plaza, Chicago, Ill. 60601.

TEACHING THE 3S, 4S & 5S. Part 1. GUIDING BEHAVIOR. 16mm, b&w, sound, 20 min. Shows actual behavior situations that trouble nursery school teachers and how teachers handle and mishandle such situations. Audience: college, general adult, parents. Purchase $120 from Churchill Films, 662 N. Robertson Blvd., Los Angeles, Calif. 90069.

TEACHING THE 3S, 4S & 5S. Part 2. SETTING THE STAGE FOR LEARNING. Shows debacle resulting from children playing in sandbox without tools or toys and contrasts it with situations in which teachers use ingenuity to enlarge children's learning experiences. Audience: college, general adult, parents. Aimed at stimulating discussion. Purchase $120 from Churchill Films, 662 N. Roberston Blvd., Los Angeles, Calif. 90069.

WASTE DISPOSAL BY HYDRAULIC FRACTURING. 16mm, color, sound 11 min. Depicts the development of a process for the disposal of intermediate-level radioactive wastes in underground bedded shale formations. Audience: scientists and engineers. Purchase $29.72 from Calvin Productions, 1105 Truman Road, Kansas City, Mo. 64106. Free loan from AEC regional film libraries or Audio-Visual Branch, Division of Public Information, Atomic Energy Commission, Washington, D.C. 20545.

WIND. 16mm, color, sound, 9 min. Introduces young child to other wind, which he cannot see, but whose effects he can see in the lifting of kites, the drying of washing on the line, or the shaking of trees. Audience; kindergarten and primary. Purchase for $120 from Film Associates, 11559 Santa Monica Blvd., Los Angeles, Calif. 90025.