

COMMUNICATIONS

Add U.S.-Europe Cable

A NEW transatlantic telephone cable system will carry the voices of 36 persons at once over a thin wire only 13/100ths of an inch thick.

The deep-sea portion of the system consists of two cables, each spanning the 2,200-mile distance from Clarendville, Newfoundland, to Penmarch, France. One cable carries speech of 36 persons going to Europe, and the other cable carries the same amount coming from Europe.

The system links United States telephone networks with those of France, Germany, Belgium, The Netherlands, Switzerland and Italy. Through European points, 36 other areas and countries can be reached, the American Telephone and Telegraph Company, New York, reported.

The tiny copper heart of the cable is protected by insulation to withstand continual soaking in the Atlantic. Extra-heavy insulation on the shore ends adds protection against ship anchors and abrasion under influence of tides. The shore-end cable lengths are a little over three inches in diameter.

The deep-water cable section, sinking nearly three miles deep in places, is only

one and one-quarter inches in overall diameter.

The 36 conversations are kept separate by placing each on its own special carrier frequency. Later, AT&T intends to double the capacity of this cable system by using a device called TASI. Now under development, TASI will fill in "silences" in the first cable as the caller listens to what is coming to him over the second cable from his correspondent.

The new cable system almost exactly duplicates one system already linking the two continents. The first system, which goes to Scotland, was laid during 1955 and 1956. The new system was laid entirely this year. Deep-water laying began on March 14. Laying was halted once in the face of huge ice fields, and once when a cable ship caught fire on June 15.

Until 1956, when the first system went into operation, transoceanic telephone conversations were relayed to Europe via radio. But AT&T reports the radio bands are now so choked with activity that the company had to resort to cables. The new system is said to have cost \$40,000,000.

Science News Letter, October 3, 1959

BOTANY

Study Giant Kelp

GIANT KELP plants along the coast of southern California, previously believed to grow only on a rocky bottom supplying firm anchorage to the sea floor, have been found also to grow extensively in thick silt and sand.

The relationship between this seaweed, *Macrocystis pyrifera*, and the sea floor was studied along a 30-mile stretch of coastline near Santa Barbara, where the bottom geology is known in detail.

Throughout approximately 60% of the total area of the beds, the kelp plants were found to grow entirely in unconsolidated fine sediment of recent geologic age, varying in thickness from six to 100 feet.

The seaward portion of each bed was on thick, fine sediment. It contained the largest individual plants and densest plant concentration. The shoreward portion, however, was found to lie on a nearly exposed rock bottom and to include sparsely distributed plants of small size, due to the vigorous wave and current action and shifting sand occurring in the adjacent surf zone.

The method of attachment and shape of "holdfast" by which the kelp anchored itself, vary with the composition of the sea floor. In areas of thick, fine sediment, anchorage is achieved by burial of spherical or vertically elongated holdfasts. In contrast, holdfasts attached to rocky bottoms are tabular, conical or irregular in shape and wrap themselves around rock formations.

Discovery of kelp attachments in soft

bottoms, according to Dr. Warren C. Thompson of the U. S. Naval Postgraduate School, Monterey, Calif., raises questions of biological and geological significance.

He told marine scientists attending the International Oceanographic Congress that the classification of *Macrocystis* into species, for example, which has been based primarily on the character of the holdfast, should perhaps be reviewed again.

This comparatively recent discovery in southern California, where kelp beds have been studied intensively for nearly 50 years, he said, suggests that the attachment of *Macrocystis pyrifera* in fine sediment will be found to occur in other parts of its widespread range.

In another paper on the giant kelp, Wheeler J. North, Institute of Marine Resources, University of California, La Jolla, told the Congress that water clarity may influence the kelp's replacement potential.

Because the kelp plants anchor themselves on the bottom, extend upward, and spread horizontally at the surface, he said, the adult plant should be relatively immune to temporary changes in water clarity. This is reasonable since the plant is able to maintain up to 60% of its photosynthetic tissue at the surface.

However, he said, because young plants germinate and develop on the bottom and because adult plants are frequently lost in storms, the clarity of the water is of great importance.

Notable and apparently permanent dis-

appearance of kelp beds have occurred, Mr. North said, in areas where sewage is discharged through ocean outfalls. Increased turbidity introduced into the water by the outfall may be important in causing this disappearance.

Transplants of young and adult kelps into such areas succeed, he said, when located sufficiently shallowly to provide adequate light and when placed in cages to afford protection from grazers.

Science News Letter, October 3, 1959

ASTRONAUTICS

Satellite's Lifetime Cut By Moon's Field

THE LIFETIME of the recently launched "paddle-wheel" satellite, powered by solar batteries, will be reduced to only two years, due to effects of the moon's gravitational field.

Without this lunar effect, Explorer VI would stay in orbit more than 20 years, Dr. Yoshihide Kozai of the Smithsonian Astrophysical Observatory, Cambridge, Mass., has calculated. Astronomers call the irregularities in the motion or orbit of a heavenly body caused by some force other than that determining its usual path "perturbations."

Since Explorer VI's orbit takes it out more than 25,000 miles from the earth at its farthest point, or apogee, the satellite's motion is affected by the moon. This, in turn, will affect the perigee, or lowest point to earth in its orbit, drawing the satellite down into the earth's atmosphere and thus significantly increasing the drag. The moon's average distance from the earth is about 240,000 miles.

Explorer VI is the first earth satellite to have its orbit appreciably perturbed by the moon. The sun's attraction adds a small contribution to the shortening of this object's lifetime. Dr. Charles A. Whitney, also of the Smithsonian Astrophysical Observatory, performed the detailed numerical calculations of Dr. Kozai's perturbation equations using a high speed electronic computer.

Science News Letter, October 3, 1959

BOTANY

Alaskan Valley Reveals Earth's Plant Growth

HOW the earth's plant life grew and developed may be revealed in the regrowth of plant life in an Alaskan valley where a volcanic eruption had destroyed all trace of life.

About 50 years ago the Valley of Ten Thousand Smokes was covered completely with debris and hot ashes by one of history's greatest volcanic eruptions. All trace of life was destroyed. An area was thus created that was considered quite comparable to the ancient surface of the earth before the most primitive forms of plant life first appeared.

A report on how plant life started to reassert itself amid the smoking desolation, and how it has developed during the interim years, has been published by the Smithsonian Institution.

Science News Letter, October 3, 1959