

earth and environment

METEOROLOGY

Laser watches clouds, smoke, dust

A large meteorological laser installation designed to measure cloud heights and detect atmospheric changes which are invisible to the eye and to normal radar, has been developed for Hebrew University in Jerusalem.

Called lidar, for light radar, the system was derived from experimental units being used in Britain by G. and F. Bradley Co. Ltd., London. Operating on the principle of a radar set, but using a pulsed light beam instead of microwave radiation, lidar offers finer angular resolution than conventional radar.

In tests with the British installations, returns have been obtained from as yet unidentified material (possibly meteorite dust) at altitudes of up to 50 kilometers. Vapor trails from jet aircraft can easily be spotted 20 kilometers up.

Using lidar, cloud heights can be measured accurately from a single point, such as a weather ship, where the baseline needed for conventional triangulation techniques cannot be established. The British Central Electricity Generating Board has been using lidar to track invisible effluent from power station chimneys. The Bradley company is at present working on the use of lidar for cloud height measurement at very low altitudes, and on the development of automatic installations for unattended operation.

RESOURCES

Mexican photogrammetric survey

A vast aerial survey of Mexico's natural resources has been initiated by the Planning Bureau of the Mexican Commission for Studies of National Territory.

The project involves 11 Government agencies, will cost an estimated \$28 million and should take at least eight years. At least five aircraft will take part in the photogrammetric survey, augmented by four or five camera-equipped helicopters for use in mountainous areas.

Beside the overall mapping, the project will be broken down into states, regions, basins and other subdivisions so that planning for development and resource exploitation can be taken on a Federal, state, municipal or private level. The area to be photographed stretches out to include the continental shelf.

ELECTRONICS

Seawater power supply

A battery using free-flowing seawater as its electrolyte has been developed for deep-sea applications by engineers at Lockheed Electronics Co., Plainfield, N.J.

The researchers believe that lifetimes as long as five years are possible with the galvanic cells, which could make them competitive with some radioisotope power supplies.

Four years in development, the cell needs no waterproofing or pressure casings, because the open sea is an inherent part of the unit. The cell is a magnesium-steel design, a type that had previously been limited to about six-month lifetimes because of deposits forming

on the steel-plate cathode. Lockheed's version, however, uses steel wool, which offers such a large surface area that the current density is below the level at which the deposits, or scaling, take place.

A 180-milliwatt version has been operating beneath 12 feet of water off New Jersey for three and a half years.

STRUCTURAL ENGINEERING

Dams from hovercraft skirts

An inexpensive way of temporarily damming a river, canal or lake has been developed by engineers using curtains similar to those which contain the air cushion beneath a hovercraft.

The dam is composed of rubber-impregnated fabric like that in hovercraft skirts, stretched over a frame of tubing. Stretched across a waterway, the pockets in the skirt fill with water just as those in a hovercraft fill with air, forming a seal against the bottom.

The idea came to engineers with the Ship Research Division of the British National Physical Laboratory when they were seeking a way to repair a testing tank without draining it completely.

MINERALOGY

First large British uranium finds

Natural uranium in appreciable quantities has been discovered at several sites in Britain, opening the possibility that Britain could, for the first time, produce economically worthwhile amounts of the raw material of nuclear power.

The sites known so far are in Staffordshire and Leicestershire, England, and in northwest Scotland. Sites in Cornwall, Lancashire and North Wales remain to be investigated.

OCEANOGRAPHY

Australian-Japanese seafloor study

A joint Australian-Japanese study of the seabed off Northern Australia and along the Great Barrier Reef will begin next month, using the Japanese research submarine Yomiuri.

An Australian research team from the Bureau of Minerals Resources in Canberra will investigate the geology of the continental shelf and the structure of the outer edge of the reef. In addition, 11 other Australian scientists will conduct individual research projects including studies of seabed sediments, life forms on and near the reef, and the Crown of Thorns starfish, which destroys the reef's coral.

Japanese scientists, during the second half of the five-month program, will conduct photographic studies of the bottom, as well as take other measurements.

The Yomiuri, built in 1964, will be towed to Australia by its mother ship, the Yamato. The research project, to be conducted in the Arafura Sea and the Torres Straits, as well as along the reef, will mark the first time that the Yomiuri has operated in Australian waters.

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