ENGINEERING

Meter Prevents Cave-Ins

A SUPERSENSITIVE gravity meter will be used in Philadelphia to detect holes under streets before the pavement caves in.

The instrument is so sensitive that cavities as small as 23 cubic feet, less than a cubic yard, have been detected. Yet the device can be operated next to a jack-hammer, although tests once were disrupted for a day by an earthquake in Alaska.

Developed by Texas Instruments, Inc., Houston, under specifications written by the Franklin Institute, the gravity meter is an answer to requests by the City of Philadelphia and gas and electric utility companies for a method of finding a cavity in the earth before the street caved in, or for finding unseen damage to utilities that might spawn a dangerous situation.

The instrument is based on the theory that a cavity, representing removal of an attracting mass, should be accompanied by a small but detectable decrease in gravity.

The meter has a small weight at the end of a delicate spring. Over a cavity, the gravity is slightly less; the spring thus contracts, and this is noted through use of a microscope. The instrument detects a change as small as four parts per billion of normal gravity.

It is a "long-period" instrument—meaning that the weight bobs up and down on its spring very slowly. This exempts the instrument from effects of rapid earth vibrations, such as produced by a jack-hammer, but slow earth vibrations, as from the Alaskan earthquake, do affect it.

The instrument is so sensitive that buildings, changes in elevation, and the sun and moon all produce measurable changes in gravity. Even simply moving 400 feet along a north-south street alters the reading 26 scale divisions because of the change in latitude.

All those changes, however, are gradual. A sudden, big change tips off the user that a cavity is underfoot.

Science News Letter, January 2, 1960

MEDICINE

Helmets Protect Drivers

HELMETS may make auto drivers and passengers look like Buck Rogers, but coupled with seat belts, their use would practically eliminate facial and brain fractures in auto accidents.

Auto accidents are the major cause of facial fractures requiring plastic surgery, Dr. Reed O. Dingman of the University of Michigan Medical School, Ann Arbor, said. Safety equipment would significantly reduce these, he told colleagues at the meeting of the American Society of Plastic and Reconstructive Surgery in Miami Beach, Fla.

He pointed out the front passenger in a car is most likely to fracture the bones of the middle portion of his face—nose, cheekbones, or upper jaw—as he is thrown forward in a crash against the instrument panel or the rear view mirror. On the other hand, the driver is more likely to injure his lower jaw.

To prevent deformity from developing in such an injured face, Dr. Dingman suggested that the surgeon align and fix the facial fractures by internal wiring as soon as possible. Otherwise, delayed treatment, poor healing or the occurrence of infection may cause a defect which needs later correction by refracturing and repositioning of the bones, or by bone and cartilage grafts.

Dr. Dingman said that although a patient's own tissue was still the best material for facial reconstruction, bone and cartilage preserved in banks had been successfully used during the past five years. More effective methods of preservation and sterilization of human tissue, including the use of cobalt as a sterilizer, are now being employed at University Hospital, Ann Arbor, he said.

Science News Letter, January 2, 1960

CHEMISTRY

"Sniffer" Challenges Nose

A MECHANICAL "sniffer" is challenging the delicacy of the human nose.

This sniffer can distinguish between types of whiskey on the breath, natural and artificial flavors, good and bad essential oils, and cigar and cigarette smoke, Dr. D. A. M. Mackay of Evans Research, New York, has reported.

The human nose has long been considered the most sensitive detector of aromas and flavors. But this machine is even more sensitive. It will help research chemists identify ingredients in oils from flowers and plants. With this information, the scientists can then develop synthetics for use in milady's perfumes, co-worker Dr. A. J. P. Martin, Nobel Prize winner from Herts, England, said.

The process is also said to be effective in the odor-flavor research areas, the field of quality control, and in research for plastics, paper, medicine and pharmaceuticals.

The "sniffer" is actually a series of ionization detectors teamed up with gas chromatographs. This means that a few cubic centimeters of vapor surrounding an aromatic material are fed into a column that separates the components. At the other end, an ionization detector signals the presence of each material as it comes from the column.

Gas chromatography is being used today for such problems as the determination of the more than 60 components in cigarette smoke, and the composition of coffee aroma, which numbers over 50 compounds, the scientists said.

Aroma is the most important single element in flavor. It is a composite of psychological responses to smell, taste, texture, appearance and sound. Manufacturers of food, flavorings and beverages are extremely interested in this aspect.

Science News Letter, January 2, 1960

AGRICULTURE

White Leaf Disease Menaces Rice Crop

INTERNATIONAL RESEARCH is keeping tabs on a potentially serious plant disease in the United States.

Ever since 1956 when "hoja blanca" (pronounced "o-ha blanka") "white leaf" disease of rice was first recognized as a virus disease in the Western Hemisphere, it has been a threat to the rice fields of Arkansas, Texas, Mississippi, Louisiana and California where the grain is a major crop.

So far the small outbreaks in Florida, southern Mississippi and southeastern Louisiana have all been effectively controlled by destroying infected crops, Dr. John G. Atkins of the U. S. Department of Agriculture's Beaumont, Tex., station told SCIENCE SERVICE. Dr. Atkin reported on the hoja blanca research to the American Phytopathological Society meeting in University Park, Pa.

Science News Letter, January 2, 1960

ENGINEERING

More Jobs Than Men Is Picture for Engineers

THE COLLEGE engineer market, subject to the fickle swing of the employment pendulum, will be getting a good picking over by industry in the early 1960's when demand for engineering graduates will exceed supply.

The Engineering Manpower and Scientific Manpower Commissions reported that industries intend to step up recruitment of engineering graduates. By 1963, about 12 engineers will be sought for each ten recruited in 1959. By 1966, the demand will be 15 for every ten. The demand will be even higher in the electrical equipment, research and development, aircraft, and communications industries.

The increased demand will come at a period when the number of engineering graduates will be declining. Early figures already point to a drop in freshman engineering enrollment in 1959, indicating the 1963 class will be even smaller.

Science News Letter, January 2, 1960