

engineering sciences

METROLOGY

Leaf growth measured electronically

A rapid, precise system of electronically measuring the areas of leaves has been developed by Paton Industries Ltd., Stepney, South Australia. The measurement of leaf areas is an important part of plant growth studies.

The leaves are fed into the space between two transparent endless belts traveling at a steady 14 centimeters a second. They cross a row of 32 photoelectric cells, each illuminated by a small lamp. A stream of impulses are transmitted to counting circuits only by cells shielded from light by the leaves. Ten transmitted impulses correspond to one square millimeter of leaf area. The cumulative total of leaf area is obtained by counting impulses and does not depend on how opaque the leaf is.

Error in measuring leaves 5 to 10 centimeters wide does not exceed 0.5 percent.

POLLUTION

Self-destroying beer bottle

A beer bottle which disintegrates when thrown away has been made by Rigello Pak AB, Stockholm, Sweden.

The container is made of rigid polyvinyl chloride, Saran, and a paper sleeve lined with thin aluminum foil and plastic glue. It weighs one-tenth of its glass counterpart, but can withstand the pressures of storage and transport.

The plastic is decomposed by sunlight and acids in the soil. The bottle can also be burned to ashes.

The Rigello bottle will be on the market this year.

MINING

Process reduces aluminum wastes

Aluminum ore-processing wastes can be reduced in bulk and valuable minerals reclaimed with a treatment development by the Bureau of Mines.

With the treatment, the volume of red mud wastes is reduced by spinning in a centrifuge. Red mud is currently disposed of by storing it in artificial ponds or by dumping it into streams. In either case minerals in the waste are lost, and land or water is polluted. Centrifuging for one minute produces a thickened red mud, whose bulk is reduced about 50 percent. It also removes a solution containing alumina and soda that otherwise would be lost. Returning the solution, after concentration, to the ore-processing operation increases the amount of alumina available for recovery and provides additional soda needed as a reagent in the extraction process.

HYDROLOGY

Water from desert regions

A technique for obtaining drinking water by solar radiation from the desert's natural resources has been developed by the Defense Laboratory, Jodhpur, India.

The technique consists of digging in the ground a bowl-shaped hole 80 centimeters in diameter and 50 centimeters deep. A rectangular tray of polyvinyl chloride plastic is placed in the hole's center. A cone-shaped plastic

cover is then placed over the hole with its apex pointing downwards and is sealed all around with earth and sand.

When the rays of the sun fall on the hole after passing through the plastic sheet, the soil is heated and its moisture evaporates. Consequently the air inside the hole gets humid and becomes saturated. The saturated air ultimately condenses on the inner surface of the plastic cover. Water droplets slide down and fall into the collecting tray.

ELECTRONICS

Glass fiber cable system

A glass fiber cable system which may one day supersede coaxial cable and microwave links between cities is being developed at the Post Office Research Station, Dollis Hills, London.

The cable would consist of several hundred hair-thin glass fibers. Each would be capable of conveying several thousands times the amount of information carried by a pair of telephone wires and several times as much as the coaxial metal conductors used in present-day television and multi-channel telephone cables, or their equivalent microwave links.

One fiber in the future glass cable would be about 0.1 millimeter in external diameter, while the central core of the cable would be a few micrometers wide.

Voices and visual and data signals would be carried in intensely concentrated form, at optical wavelengths generated by an infrared laser.

PHOTOGRAPHY

Ordinary camera gives 3-D pictures

Photographs of scenery taken by an ordinary camera in ordinary light can be converted by a laser beam into three-dimensional panoramic pictures, using a technique developed at California Institute of Technology, Pasadena, Calif.

Called holographic stereography, the uniqueness of the technique lies in the conversion of sequences of ordinary photographs into overlapped and superimposed laser pictures to produce one three-dimensional laser picture, according to Dr. Nicholas George.

TIRE STRENGTH

Direct measurement of cord-loads

A technique for measuring tire strength directly has been developed by the University of Michigan's department of engineering mechanics.

The technique utilizes small force-transducers which can be built into the tire cord in such a way that the cord-load can be measured directly and more reliably than other methods.

The technique has so far been applied to four sizes of cord only, but it can be used for any size. The transducers give easily usable measurements of cord-loads ranging from zero to ten pounds, a range that includes most loads experienced by a cord during ordinary automotive tire operating service. Measurements have been made of cord-loads in the tire's crown, shoulder, and sidewall regions.

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