

chemistry

INSULATION

Waterproof cable devised

Bell Telephone Laboratories in Murray Hill, N.J., has come up with a coating that prevents water from short-circuiting underground electric cables even if the protective casing is penetrated. The coating, a mixture of petroleum jelly and polyethylene plastic, is applied to the conducting wires. Normally, the space between the wires and the casing would be occupied by air.

Now, when the casing is penetrated by lightning, a tractor, plow or shovel, the ground water that would ordinarily penetrate through to the wires and cause a short circuit is stopped by the plastic-jelly mixture on the wires.

Three coats of the mixture are applied: one on the wires, another on top of the tape wound around the first layer and a third over an aluminum layer, which is covered with a final plastic jacket.

ANALYSIS

Hopewell Indian trade routes

A combination of meteorites and neutrons is being used to track the extensive trading operations of the Hopewell Indians of Ohio. To trace the trade routes of the Hopewells, who roamed all over the United States, Dr. John T. Wasson, chemistry professor, of the University of California at Los Angeles analyzed art objects from the Hopewell's burial grounds. Some artifacts were of meteoritic material. By bombarding the material with neutrons Dr. Wasson determined the concentrations of trace elements of gallium, germanium and iridium. Their concentrations matched those of meteorites known to have fallen 1,000 miles away in Kansas. The evidence puts another pin on the sales map of the Hopewell Indians.

CHEMICAL WARFARE

Nerve gas detector

What the Army terms a major breakthrough in chemical warfare defense is in its final stages of development at Edgewood Arsenal in Maryland. For the first time, an automatic and portable chemical field alarm will warn U.S. troops of the presence of odorless and colorless nerve gases.

After four years of research, an electrochemical cell has been developed which continuously monitors the air and in the presence of a nerve gas produces electricity to trigger an alarm. The instrument, which weighs less than 15 pounds, responds to concentrations of nerve gas below hazardous levels.

PESTICIDES

DDT killing off falcons

Fierce and swift, steel blue in color and called the world's most perfect flying machine, the peregrine falcon is heading toward extinction in North America. The reason: DDT. Perilously high levels of the pesticide and related chemicals have been found in the eggs, fat and

tissues of the birds from as far north as the Arctic, reports Dr. Tom J. Cade, research director at Cornell University's Laboratory of Ornithology.

The falcons, which have disappeared from the eastern United States and western Europe, have had a refuge in Alaska. They are not picking up the DDT directly, but get it by eating other birds which, in their southern migrations, ingest DDT-contaminated insects. The falcon is in greater danger than the bald eagle, asserts Dr. Cade.

FOOD

Protein from cotton

Overlooked as a source of protein is the cotton plant, the seeds of which contain important amino acids. A drawback to its use as a protein source is gossypol, a toxic pigment in cottonseeds.

Now researchers under Dr. E. A. Gastrock at the U.S. Department of Agriculture's Southern Regional Research Laboratory in New Orleans have developed a liquid cyclone process to remove the gossypol. Basically, the process entails rolling the cottonseed kernel into flake form. Scattered throughout the flakes are dark granules which contain the gossypol. By suspending the finely ground flakes in hexane, a hydrocarbon solvent, and whirling the suspension in a centrifuge, 85 to 90 percent of the granules can be removed.

Gossypol is no problem in the widely used edible oil derived from cottonseeds, since it is only slightly soluble in oil and the traces are easily removed.

PURIFICATION

Bubbles clean up water

Swedish scientists have a process to purify both natural water supplies and sewage. The water is treated with chemicals so that a light-weight precipitate in the form of hydroxide flocs is produced. These flocs absorb the impurities on contact. In order to separate the flocs and impurities from the water, minute bubbles are injected which adhere to the flocs and make them buoyant. They thus form a sludge blanket on top of the water that can be skimmed off.

The minute bubbles are made by mixing air and water under a pressure of about 70 pounds per square inch so that the air dissolves in the water. This air-water solution is then introduced into the water to be treated; the pressure drop releases the minute bubbles.

POLLUTION

Allergenic chemical found in air

Chemists at the National Center for Air Pollution Control in Cincinnati have identified an air-borne chemical associated with allergic reactions. The substance, scopoletin, is known to exist in pollen grains, but this is the first time it has been found circulating freely in the atmosphere, according to Dr. Eugene Sawicki of the center. Scopoletin had previously been identified in cigarette smoke and tobacco.

It is possible that when pollen breaks up and disappears, the scopoletin remains, causing hay fever effects.

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