

instruments used, and the wealth of scientific information gained.

PLANT EXPLORER: David Fairchild—Beryl Williams and Samuel Epstein—*Messner*, 192 p., \$2.95. Juvenile biography.

RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS—Harald Cramer—*Cambridge*, 2nd ed., 119 p., paper, \$4. Reprint of 1937 edition with minor corrections.

THE REVOLUTION IN SCHOOL MATHEMATICS: A Challenge for Administrators and Teachers—*Nat. Council of Teachers of Mathematics*, 90 p., paper, single copies free upon request direct to publisher, 1201-16th St., NW, Washington 6, D. C. Report of Regional Orientation Conferences in Mathematics.

SEEING THE EARTH FROM SPACE: What the Man-Made Moons Tell Us—Irving Adler—*Day*, rev. ed., 160 p., illus. by Ruth Adler, \$3.75. Tells young people about the scientific work accomplished by artificial satellites.

SOCIAL JUDGMENT: Assimilation and Contrast Effects in Communication and Attitude Change—Muzaffer Sherif and Carl I. Hovland—*Yale Univ. Press*, 218 p., \$6. Relates findings from the psychophysical laboratory to the process of attitude modification and opinion change.

SOVIET CHEMISTRY TODAY—V. I. Spitsyn—*NAS-NRC*, 302 p., diagrams, paper, \$2.50. Series of six lectures presented in the U.S. in the inter-Academy exchange program.

INVENTION

Patents of the Week

➤ A METHOD to date objects 100,000 or more years old and to establish the authenticity of such ancient artifacts has been patented.

The dating method was developed by Drs. Irving Friedman and Robert L. Smith of the U.S. Geological Survey, who assigned rights to patent No. 3,010,208 to the Government. It depends on the discovery that during long periods of time obsidian, or volcanic glass, absorbs water from the atmosphere and forms an ever-increasing but extremely thin outer layer.

The thickness of this very narrow layer can be measured with a powerful microscope. To determine how long the obsidian had taken to absorb the moisture, Drs. Smith and Friedman measured the moisture layer in objects previously dated by radiocarbon or other methods. The results were then used to establish a yardstick for dating obsidian objects by measuring the thickness of their moisture layer.

Obsidian, or volcanic glass, ranges in color from almost clear to jet black. It was widely used by ancient man to make tools, utensils, weapons and ornaments. Obsidian holds a good edge and is excellently suited for knife blades and arrowheads.

In working with man-made obsidian objects that have some of the original surface intact, it is possible to measure both how old the glass is, if conditions under which it was formed are known, and how long ago man worked the surface.

Since the dating method is applied directly to the artifact, it allows detection of fraudulent objects. The difficulty of such detection prior to this invention probably encouraged

the manufacture of fraudulent artifacts, Drs. Smith and Friedman believe.

Dr. Friedman told SCIENCE SERVICE that the dating method was now being tested to see if it could be used to determine when glacial moraines and river terraces containing volcanic glass were formed. He said a major problem of the method is that some soils seem to remove the moisture layer, and investigations are now being made to determine what soils do so and under what conditions.

A flexible, light-transmitting tube to be used for examining the human stomach or intestines received patent No. 3,010,357. It was awarded to Dr. Basil I. Hirschowitz of Ann Arbor, Mich., a physician, who assigned one-third rights each to the instrument's co-developers, physicists Dr. C. Wilbur Peters and Lawrence E. Curtiss.

The snake-like tube, which can be three feet or more in length and one-half an inch or less in diameter, contains many thousands of tiny glass fibers. At the base of the device a series of mirror reflectors send the image back up the tube. A thin electric wire runs down the side of the instrument and carries power to a small floodlight that lights up the stomach.

The highly flexible device can be inserted through the open mouth of a patient and through the stomach and into the duodenum, where approximately 75% of peptic ulcers occur. Since the duodenum can actually be seen by the physician, immediate diagnosis can be made, without resorting to X-rays.

The outside of the tube is surrounded with a metallic shell formed of three long,

narrow metal strips. Each of these extremely thin strips is wrapped over the other in the form of a helix going in three different directions. This form of winding gives the tube its extreme maneuverability.

For a method of keeping an off-shore well drilling ship in position above the well being bored, William R. Postlewaite of Menlo Park, Calif., was awarded patent No. 3,010,214. Rights were assigned to California Research Corporation, San Francisco, Calif.

In drilling wells beneath ocean waters, wind and tidal currents often cause such stresses on the drill string that failure occurs. To reduce the chances of such failures, Mr. Postlewaite devised an instrument, to be lowered along the exterior of the submerged drill string, that tells how much the drill string deviates from the vertical. The floating vessel containing the drilling rig can then be moved so as to eliminate the curvature of the drill string.

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PUBLIC HEALTH

Every Major Building Has Shelter Possibility

➤ NEARLY EVERY MAJOR building offers some possibility of shelter against the effects of warfare in the nuclear age, a Building Research Institute conference was told in Washington, D.C.

The shelter use can frequently be developed "quite economically" without any adverse effects on the normal use of the building. However, substantial economies and better protection result when plans for a shelter area are incorporated in the architect's original building design.

The requirements for a shelter that can withstand blast effects are much more of a problem for the architect than are the shelter requirements for protecting only from fallout, Lyndon Welch, an architect of Eberle M. Smith Associates, Inc., Detroit, Mich., said.

Even where budget requirements do not permit construction of a blast shelter, he reported, it is good practice to design fallout shelters with the fewest and smallest possible openings in the exterior protective wall. If the lengths of interior spans and other structural details are also set so as to develop maximum resistance to blast forces, the blast closures can then be added later without too much difficulty.

Mr. Welch's conclusions are based on studies of shelters in schools, multi-story office buildings and multi-story apartment buildings performed for the Office of Civil and Defense Mobilization by his Detroit firm. The studies were primarily concerned with radiation protection, although all structures were analyzed for inherent resistance to blast.

For purposes of the studies, it was assumed that normal water supply, power and sanitary systems would be disrupted and not available for use. Mr. Welch urged development of a well on the shelter site where possible.

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