

TECHNOLOGY

Mud-Jacking Raises 300 Floors in Housing Area

► HOME OWNERS who have become dismayed because the floors in their houses have sunk may find new hope in a quick, easy and relatively inexpensive method of raising the concrete slab back to where it should be.

Called mud-jacking, the method was used in Pearl Harbor, T. H., by the District Public Works Office when about 300 concrete floors sunk in Naval Base Housing Areas. Some of them settled as much as seven inches.

A slurry of mud and water was mixed and pumped through holes drilled in the concrete slabs. Under a pressure of 100 pounds per square inch, the mud gushed from the hose nozzle and restored the slabs to their proper position.

Improvements in the process were made as more floors were raised. The last 33 floors restored in March cost an average of only \$42.66 each. If the slabs had been broken, removed and replaced, the cost would have been about \$325 each.

Although mud-jacking is not new, it has not found widespread use in raising concrete flooring slabs of houses. The method has previously been used primarily to jack up concrete approaches to bridges to eliminate bumps.

But before the process can be used on houses, the sunken slab must be made "free floating." That is, it cannot have walls resting upon it.

In houses where the walls are put up first and the concrete slab poured last, the binding between walls and slab is broken and mud-jacking begins. If the bond cannot be cut, the slab may crack under the pressure of the mud.

The process may be used in other housing projects as more persons learn about the new application. Already some floors in the United States have been restored by mud-jacking.

Details of the Pearl Harbor mud-jacking project are reported in the *Civil Engineer Corps Bulletin* (Aug.).

Science News Letter, September 6, 1952



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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

BEE-T-SUGAR ECONOMICS—R. H. Cottrell, Ed., *Caxton*, 379 p., illus., \$5.00. Beet sugar produced in the U. S. supplies about 25% of the domestic market and has to compete with cane sugar produced with cheap labor. Political aspects of this industry are also discussed.

THE CABINETMAKER'S TREASURY—F. E. Hoard and A. W. Marlow—*Macmillan*, 267 p., illus., \$6.00. Step-by-step procedures for reproducing period furniture, including drawings of authentic antiques. For the skilled craftsman or amateur.

CAMBRIAN STRATIGRAPHY AND PALEONTOLOGY NEAR CABORCA, NORTHWESTERN SONORA, MEXICO—G. Arthur Cooper and others—*Smithsonian Institution*, Smithsonian Miscellaneous Collections, Vol. 119, No. 1, 183 p., illus., paper, \$3.00. Cambrian rocks were not discovered in Mexico until 1941. The various groups of fossils now known are described.

THE CASE OF DORA AND OTHER PAPERS—Sigmund Freud—*Norton*, 243 p., \$3.50. Some of these eight essays, written between 1905 and 1918, were previously published under the title "Freud on War, Sex and Neurosis." The title paper is the history and treatment of a case of hysteria.

THE CRYSTAL STRUCTURE OF SOLID CHLORINE—Robert L. Collin—*Mellon Institute*, 2 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

INTRODUCTION TO CONCEPTS AND THEORIES IN PHYSICAL SCIENCE—Gerald Holton—*Addison-Wesley*, 650 p., illus., \$6.50. An introductory text designed for students who do not intend to major in chemistry or physics. Presents basic ideas and theories rather than a survey of the field.

MAN INTO WOLF: An Anthropological Interpretation of Sadism, Masochism, and Lycanthropy—Robert Eisler—*Philosophical Library*, 286 p., \$6.00. Suggesting the possibility that crimes of violence, including murder and war, have their origin in man's evolutionary past.

MEETING OF MINDS: A Way to Peace through Mediation—Elmore Jackson—*McGraw-Hill*, 200 p., illus., \$3.50. A study of the techniques and practices used in settlement of disputes of labor and between nations, their similarities and dissimilarities, for the purpose of discovering how experiences in one field may contribute to the other.

PHOTOGRAPHY ANNUAL: 1953 Edition—Bruce Downes, Ed.—*Ziff-Davis*, 282 p., illus., paper, \$1.00. This year's edition of outstanding pictures, both American and foreign, contains a section on color photography and a number of picture stories. Notes in the back of the book tell how the pictures were taken and the equipment used.

PLAYTIME WITH PATTY AND WILBUR—Hugh C. McDonald—*Murray and Gee*, 31 p., illus., paper, \$1.00. Written by a police official in the hope that these stories, read by parents to children, will help to protect the youngsters from sex criminals.

THE SCIENCE OF ZOOLOGY—James C. Perry—*Bruce*, 709 p., illus., \$6.50. A text presenting zoology as a science in its own right and not as an introduction to specialized fields.

SPIKE: The Story of a Whitetail Deer—Robert M. McClung—*Morrow*, 64 p., illus., \$2.00. A child's story in large print telling what happens to this deer from the time he tries out his unsteady legs to the end of his first year when the spikes that will be his antlers appear.

SURFACE COMPLEXES ON CARBON BLACKS. I. High Temperature Evacuation Studies—R. B. Anderson and P. H. Emmett—*Mellon Institute*, 3 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

TWELFTH SEMI-ANNUAL REPORT OF THE ATOMIC ENERGY COMMISSION—Gordon Dean, Chairman—*Govt. Printing Office*, 125 p., paper, 35 cents. A summary of major advances in atomic energy programs from January to June, 1952, including research in the medical, biological and physical sciences.

TV TROUBLESHOOTING AND REPAIR GUIDE BOOK—Robert G. Middleton—*Rider*, 204 p., illus., paper, \$3.90. Practical guide with limited theoretical discussions and explanations. Included is a chapter on test equipment emphasizing the oscilloscope.

VIRUSES AS CAUSATIVE AGENTS IN CANCER—C. P. Rhoads, Ed., *New York Academy of Sciences*, Annals of the New York Academy of Sciences, Vol. 54, Article 6, 360 p., illus., paper, \$4.00. Comprehensive collection of current studies on the microbial hypotheses as to the cause of cancer.

WINTER AND SPRING FLOWERS—Constance Spry—*Studio Publications* (Crowell), 140 p., illus., \$5.50. A companion volume to the author's "Summer and Autumn Flowers," it deals mainly with floral arrangements. In a chapter on Christmas decorations, she has some suggestions other than the traditional.

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Do You Know?

Animal life in the sea exists even to depths of four miles.

Vanadium once was so rare that a pound of it brought \$4,760.

Diesel locomotives, on the average, carry a ton of freight 500 miles on a gallon of fuel oil.

About 31 acres of ordinary woodland are required to give as much grazing for cattle as an acre of good pasture.

The puma and the housecat have similar tooth formations, but the American bobcat has two less teeth than the housecat.

Questions

BIOCHEMISTRY—How can blood stains be identified? p. 151.

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CHEMISTRY—What gives pepper its taste? p. 150.

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ENTOMOLOGY—How can the insect-killing power of DDT be prolonged? p. 153.

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ELECTRONICS—How could attacking enemy planes be prevented from homing on radio stations? p. 154.

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HOME ECONOMICS—Is freezing your nylons to make them last longer recommended? p. 155.

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PSYCHOLOGY—How can worms be taught to turn? p. 156.
Is a professor's daughter a good bet for a clerical job? p. 156.

• • •

RADIO ASTRONOMY—How does the sun affect the noise of radio stars? p. 152.

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SEISMOLOGY—Of what is the earth's heart made? p. 155.

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Photographs: Cover and p. 154, U. S. Air Force; p. 147, Bell Telephone Laboratories; p. 149, Firestone Tire and Rubber Company; p. 151, Associated Photographers; p. 157, Emerson Radio and Phonograph Corporation.

VETERINARY MEDICINE

DDT Sprays Do Not Harm Beef Cattle

➤ CONTINUED SPRAYING of beef cattle with DDT insecticide apparently does not have any poisonous effect on the animals and does not interfere with weight gains. Studies showing this have been made by two Texas veterinarians, the American Veterinary Medical Association reported in Chicago.

Less than 90 parts per million of the DDT were absorbed by the cattle tested and these minute amounts were largely stored in the fat.

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GOOD BIOLOGICAL TEACHING MATERIAL CAN HELP PRODUCE "THE GOOD MAN"

Quintilian, a literary critic during the First Century, held that education, from the cradle upwards, is something which acts on the whole intellectual and moral nature, and whose object is the production of "the good man." Most people will accept this. Therefore, since biological science plays such an important part in modern life, it is rational to expect that everybody study a great deal of biology, particularly anatomy, botany, physiology, and zoology. And, since the modern microscope has done more than any other instrument of its size to enhance the better life, it is important that more and more people study the minute structures of animals and of man. Otherwise, a normal outlook on life is impossible.

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Centralia, Illinois

PHYSICS

Cosmic Ray Mystery

Origin of cosmic rays and how they attain their near light-speed velocities are problems being attacked through use of high-flying balloons carrying photographic plates.

➤ ONE OF the deepest mysteries of the sky about us is the nature and origin of cosmic rays. What they are, where they come from and what they do is currently puzzling scientists.

Cosmic rays are particles that are accelerated in space to velocities near the speed of light. They include positrons, mesons, protons and the so-called "heavy nuclei."

Positrons are positively charged electrons. Mesons are particles with a mass greater than electrons but less than the positively charged nuclear proton. Heavy nuclei are atoms that have been stripped of their outer electrons.

The cosmic particles bombard the earth constantly at energies millions of times greater than scientists can obtain with modern accelerations. It is not known how these energies are reached.

Most of the cosmic rays that shoot in from outer space do not penetrate the earth's atmosphere to sea level. Called primary radiation, the rays frequently strike atoms of gases that make up the air. When they do, the atom usually is smashed and its particles race off in many directions. Those particles are detected on earth as secondary cosmic rays.

Scientists studying cosmic rays under a broad Navy program say it is a frustrating task. To study the primary rays, the "laboratory" should be about 23 miles above the earth where the original particles can be found.

Laboratory instruments and equipment, of course, can be carried to such heights by present-day rockets, but the rocket flight is a short-time proposition. Cosmic ray apparatus should be kept at the high altitudes for hours.

Balloons currently are being used by the Navy scientists to carry instruments high into the air and to hold them there while the mysterious particles shoot into the equipment and leave tell-tale tracks on photographic plates. Other equipment radios information to the ground as soon as a cosmic ray is detected.

So tiny are the photographic traces of cosmic rays, they must be found under a microscope. Two dozen plates of film, properly exposed, are sufficient to keep scientists busy for two or three years.

The Navy scientists say their research program is a basic one as contrasted to an applied research program. They explain that no definite goal is sought, such as harnessing cosmic rays.

Basic research always is needed and usually pays off. The scientists believe the

bits of cosmic-ray knowledge gathered by researchers eventually will be tied together by science into another advancement for mankind.

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PHYSICS

New Device Measures Drag of Air on Ground

➤ A SHEAR meter, so sensitive that it can measure a drag force of only 1/100,000th of a pound per square foot, has been developed by John E. Vehrencamp of the University of California at Los Angeles.

It was designed for a study of the drag effect of air currents on the earth's surface and its influence on wind velocities and transfer of heat into the air. Such factors are related to problems in orchard heating and the laying of smoke screens.

Its data should be more accurate than those from earlier models.

The device consists of a round container in which the immediate terrain under study is duplicated. This container is suspended in a liquid silicone. Drag forces on the duplicated surface are measured by an electronic device underneath the container.

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