

## OCEANOGRAPHY

**Land "Mapped" Beneath Gulf of California**

FOR THE FIRST time the hills and valleys beneath the mud-and-sand bottom of the Gulf of California have been mapped.

The mapping was completed by Dr. John C. Harrison of the Institute of Geophysics at the University of California, Los Angeles, and Dr. Michael Caputo of Italy's University of Trieste, during a two-month scientific voyage aboard the SS Horizon, the 505-ton research vessel of the Scripps Institution of Oceanography.

Cross-crossing the Gulf between Baja California and the Mexican mainland, the two scientists measured the pull of gravity of the invisible rock formations, with changes in the pull indicating variations in the height and composition of the ridges.

Their tool was a gravity meter, an apparatus so sensitive that it can detect changes in gravity of one in a million.

It will take about a year to evaluate the data, after which scientists will have the first map of the "land" beneath the Gulf.

"This is one of the first large-scale gravity surveys made from a surface ship," says Dr. Harrison. "Until now, most measurements were taken by submarines which could dive under the waves and float in still water."

The survey, supported by the U. S. Office of Naval Research, is part of the "Vermilion Sea Expedition," a wide-ranging study by the University's Scripps Institution.

Besides its importance to oceanographers and the Navy, the study may lead to oil explorations beneath the ocean floor.

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## PSYCHOLOGY

**Decision-Making Helps Child Accept Authority**

A BOY TODAY is probably no more rebellious than his father was. Educators agree today's children ages nine through 12 are not drastically different from yesterday's children of these same ages.

A four-year study of school programs across the country, conducted by the U. S. Office of Education, found reassurances among the 1,300 educators who work with some of the nearly 8,000,000 children in grades four through six.

There are differences in society now, however. Some children—"door-key" children—are being deprived of adult companionship at important times such as immediately after school is over to supper time. Children who are accustomed to being with adults and talking things over with their parents and teachers are likely to continue doing this. They are able to live within the regulations that have been agreed upon.

Most children from nine to 12, educators generally agree, want to be useful, to try out their own powers in making and doing things. They want to think for themselves,

but they also want to develop codes of behavior which will meet the approval of adults around them.

Those children who have had no hand in decision-making, but simply have been required to live by pre-set adult rules, are likely to rebel against authority.

Children do need and want to know what is expected of them, the study showed. It is not knowing that upsets them. This is especially true when parents or teachers are indifferent to them, or when demands made upon them by adults are not consistent.

Methods teachers and curriculum-makers use to educate children in grades four through six make up a major part of the report. Both slow and gifted children can be challenged to learn and to improve their skills along many lines, the educators said.

The committee which prepared the study included Drs. Helen K. Mackintosh, chief of the Department of Health, Education and Welfare's elementary schools section, Gertrude M. Lewis, Paul Blackwood, Jane Franseth, and Elsa Schneider.

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## PUBLIC HEALTH

**7,000 Students Answer Queries About Smoking**

WHEN, WHERE AND IF junior and senior high school students smoke is the target of a study recently launched.

More than 7,000 students from the seventh through the twelfth years in the Newton, Mass., schools have filled out initial questionnaires prepared by the staff of the department of epidemiology of the Harvard School of Public Health.

The study will seek the answers to such questions as when are smoking habits formed; what are the influences that lead to the establishment of such habits; do young people smoke because their parents smoke?

The entire survey will extend over a three-year period. It will include follow-up interviews with a selected group of parents and students, Dr. Eva J. Salber, research associate in epidemiology and director of the study, reported.

The questions asked each student separates them into three groups: those who have never smoked, those who have smoked and stopped, and those who now smoke.

Beyond the statistical evidence seeking out the length of time smokers have smoked and the extent of their smoking, the Harvard survey also seeks to relate the habit, or lack of habit, to book reading (apart from class assignments), television viewing (the average number of hours during the week and over the week-end), driving habits and extracurricular activities such as dances, clubs and athletics.

Although no direct attempt is made to link cigarette smoking with the onset or prevalence of lung cancer, two of the questions deal with this topic: Have you ever heard that lung cancer may be caused by smoking? Do you believe that smoking causes lung cancer?

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**IN SCIENCE**

## RADIO ASTRONOMY

**Radio Sources Studied for Space Communications**

HOW AND WHEN the radio signals sent out by heavenly objects called radio "stars" change, or "twinkle," is giving information that may aid in solving problems of communication between the earth and space vehicles.

Dr. H. C. Ko, assistant director of the Ohio State University Radio Observatory, measured the scintillation effects of the earth's atmosphere on radio waves from the source known as Cygnus A at a wavelength of about 13 inches. The changes in radio signals result from moving irregularities in the ionosphere, hundreds of miles above the earth's surface.

Cygnus A, a very strong radio wave source, actually consists of two galaxies, each containing billions of stars, colliding at a distance of 200,000,000 light years. A light year is the distance light, traveling at 186,000 miles a second, covers in one year.

Dr. Ko found the scintillation effects previously observed at longer wavelengths were also present at the 13-inch wavelength. The "twinkling" was usually most pronounced when the source was rising or setting. However, during auroral disturbances, strong scintillation effects were also noted when the star was high in the sky.

Statistical studies of the scintillation showed a variety of seasonal effects and, at certain times, a close relation to disturbances in the earth's magnetic field.

Dr. Ko's observations were made with the 40-foot steerable dish-shaped radio telescope in a Research Foundation project conducted for the U. S. Air Force Cambridge Research Center.

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## ASTRONAUTICS

**U. S. Orbits Glass Rocket That Holds Space Promise**

THE UNITED STATES has fired a 50-pound glass rocket into orbit, and indications are that more of them are to come.

The third stage of Vanguard III, which put a 50-pound payload into orbit on Sept. 18, was made of glass fibers bound with a plastic substance. The 50-pound glass rocket motor burned ten seconds longer than other third stages used on earlier Vanguards and went into orbit with the payload, the National Aeronautics and Space Administration said.

A similar glass-fiber rocket motor is now scheduled for use on NASA's Thor-Delta vehicle which is scheduled to put a 100-foot balloon into orbit around March. The glass-fiber rocket will form the Thor-Delta's third stage.

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# E FIELDS

## PSYCHOLOGY

### Personality Tests Find Future Suicides

PERSONALITY TESTS can be used to predict which mental patients will later attempt or succeed in killing themselves.

How to predict suicide was described to the American Psychological Association meeting in Cincinnati by two research teams from Veterans Administration hospitals in Los Angeles, Calif., Durham N. C., and Brockton, Mass.

Significant answers to the standard "MMPI" personality test were found to characterize persons who later showed various kinds of suicidal behavior, Drs. Norman L. Farberow and Edwin S. Shneidman of VA Center, Los Angeles, reported.

The well known Rorschach ink blot test can be used to spot the person who may wind up a suicide, Drs. Paul G. Daston of VA Hospital, Durham, N. C., and George A. Sakheim of VA Hospital, Brockton, Mass., reported. One way of scoring the test classified correctly 83% of non-suicidal mental patients, 72% of those who later tried to kill themselves and 82% of those who were actually successful suicides.

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## METEOROLOGY

### Weather Bureau Gives Information for Olympics

WEATHER and climate information for the Squaw Valley, Lake Tahoe, Calif., area where the 1960 Winter Olympics will be held next Feb. 18-28 has been compiled by the U. S. Weather Bureau.

Squaw Valley lies just east of the ridge of the Sierra-Nevada. It is about two and a half miles long and a quarter mile wide. Mountains rise abruptly from the valley floor, which is about 6,200 feet above sea level, to ridges of 7,000 to 8,000 feet in all directions.

The prevailing winds and the highest winds are probably from the southwest. Temperatures show the wide variations typical of a high mountain valley, with the range between the mean temperature of the warmest month, July, and the coldest month, January, averaging 35 degrees. Highest temperature recorded at Squaw Valley is 90 and the lowest is 15 degrees below zero Fahrenheit.

Freezing temperatures, the Weather Bureau reports, can occur in every month of the year, thus restricting local gardening to the most hardy vegetables and flowers. Because of the protective winter snow covering, the ground usually does not freeze below the immediate surface.

Most of the precipitation falls as snow in the winter months. More than three-fourths of the annual average precipitation

occurs in the five months from November through March.

The heaviest observed precipitation during one day was 5.10 inches on Dec. 23, 1955. Hourly precipitation intensities of four-tenths of an inch or more and 24-hour amounts of four inches or more recur about every two years. Wintertime thunderstorms are rare, although summertime ones are not.

The first snow generally falls in the valley in the last half of October and by the first of December the floor of the valley is usually covered with snow. The snow cover increases to a median depth of two feet on Jan. 1, four feet on Feb. 1, and a winter seasonal peak of five feet the first half of March. It then decreases rapidly to disappear on the valley floor on the average by May 1.

At higher elevations, snow continues much later, starts earlier in the fall and accumulates to greater depths.

The greatest monthly snowfall recorded was 72 inches in March, 1958. The greatest daily fall was 49 inches on April 3, 1958, and the greatest depth on the ground was 130 inches, also on April 3, 1958.

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## PUBLIC HEALTH

### Protection Planned Against Atomic Wastes

WAYS of protecting the earth from contamination by the radioactive waste created by the atomic energy industry will probably become the responsibility of the International Atomic Energy Agency which, with cooperation of UNESCO and FAO, assembled some 200 scientists in Monaco to discuss the disposal of such wastes.

The agency also set up a panel to formulate recommendations for an international agreement on disposal of radioactive wastes into the sea. Such an agreement would guarantee that no excessive amounts of radioactive waste products could be released into the oceans and build up to become a hazard to man.

Dr. W. G. Kaufman of the University of California reported that the deep underlying formations of the earth might be the right storehouse for radioactive wastes. Dr. Kaufman believes that storing the waste products in sandstone formations might under certain circumstances be more economical than to provide sufficient chemical treatment in order to allow the discharge of the effluent to surplus streams or estuaries. A two-well prototype injection system has been in operation at the Engineering Field Station of the University of California for two years.

Synthetic wastes containing trace concentrations of strontium 89 and cesium 134 were continuously introduced into the ground for periods up to six weeks. For a disposal system, Dr. Kaufman conceived a pattern of injection wells for introducing the waste into the deep formations of the earth and relief wells which are to serve to reduce well-head pressures and at the same time direct the flow so that maximum use of the formation can be made.

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## MEDICINE

### Trachoma Virus Isolated By U. S. Research Team

A VIRUS from the eye of a man with trachoma, a serious eye disease, has been isolated for the first time in the United States.

Light sensitivity, pain and tearing characterize this disease, in which the delicate membrane that lines the eyelids and covers the eyeball in front—the conjunctiva—becomes inflamed.

Now, many intriguing questions concerning this eye disease which afflicts close to half a billion persons are under study, a team of San Francisco researchers reports in *Science* (Nov. 13). Found mainly in Africa, Asia and parts of Europe, the disease is no longer widespread in the U. S. where it occurs mostly in the West and Southwest.

Some of the research that can now be undertaken includes production of the virus toxin and studies of its "pathogenetic potential." Scientists are also interested in comparing this virus with those isolated from trachoma-infected eyes in China, Gambia (Africa) and Arabia.

The virus belongs to the elementary-body virus of the psittacosis-lymphogranuloma group, report Drs. L. Hanna, P. Thygeson and E. Jawetz of the University of California Medical School, and Dr. C. Dawson of the U. S. Public Health Service's Communicable Disease Center.

Scrapings were obtained from a trachoma patient's conjunctiva and injected into young embryo eggs. The virus strain found was similar in size and other properties to those grown in foreign research. Some monkeys inoculated with an egg yolk mixture of the virus had symptoms of the disease.

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## ASTRONOMY

### Heavenly Object Called "Remarkable" Galaxy

MESSIER 82, which consists of millions of stars clustered together in an irregular form, is a "remarkable" galaxy, two astronomers reported.

Drs. W. W. Morgan of the University of Chicago's Yerkes Observatory and N. U. Mayall of the University of California's Lick Observatory studied the light from the exceptional cluster on photographs taken with the 82-inch McDonald Observatory telescope. They found the light from this irregular galaxy is very much redder than that from other galaxies of the same class because Messier 82 is embedded in a very large dust cloud.

M-82 is a faint object located in the constellation of Ursa Major, the large bear, between the pointer stars in the Big Dipper and the Pole Star.

The presence of heavy dust in and around this galaxy sets M-82 off from most other irregular galaxies, they reported to the National Academy of Sciences meeting in Bloomington, Ind.

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